Lower Coosa River
Basin Management Plan

May 2005

Alabama Clean Water Partnership

It Takes Everyone Doing Their Share

Do Your Part To Keep The Lower Coosa River Basin Healthy!

With so many competing uses for the water in the Lower Coosa River Basin, opportunities for conflict continue to rise and the incidence of degraded water quality continues to rise along with it. If everyone works together, however, water quality can be preserved -- for residents and visitors now, and for future generations. It takes everyone in the basin doing their part everyday. The following list provides suggestions of things everyone can do to help safeguard the waters of the Lower Coosa River Basin.

Home and Gardening

- Maintain septic tank and field lines to prevent sewage pollution. Septic tanks should be pumped every three to five years.
- Open paint containers and allow the paint to dry (or stir in kitty litter to solidify the liquid) before throwing away.
- Park vehicles on a lawn area or other grassy surface when washing.
- Don't litter. Regularly clean up trash and debris; especially from parking areas.
- Collect and properly dispose of litter and trash found along roadways and curbs.
- Identify and cap inactive wells.
- Follow recommended product application rates for fertilizers, herbicides and insecticides as given on product directions.
- Consider options such as increased native and adapted plant beds or mulched or native areas, rahter than high maintenance turf, to reduce the need for chemicals, water, and mowing.
- Compost your yard trimmings and create a beneficial soil conditioner that will reduce the fertilizer and watering requirements for the plants in your landscape.
- Maintain and protect trees and shrubs or when adding to your garden or yard, plant new trees and shrubs. Trees and shrubs help prevent erosion.

How We Build

- Preserving natural areas in developments.
- Avoid excessive impervious areas; especially near structures, drainage ways (including curb and gutter) and flowing streams.
- Install vegetated buffers between parking bays and around the edge of parking lots.
- Minimize land disturbance activities and do not leave dirt exposed.
- Plant or replant trees in open areas along waterways.
- Sod first 25 feet of property adjacent to streams.
- Use construction best management practices.

Boating

- Reduce water pollution through proper fueling, waste disposal and proper maintenance.
- When cleaning your boat, use detergents sparingly and use environmentally friendly cleaning methods and products like baking soda, vinegar and lemon juice.
- Protect sensitive habitat by going slowly in shallow areas and avoid boating through dense hydrilla mats to minimize spreading of hydrilla.

Community Clean Ups

- Initiate clean-up programs to eliminate illegal dumps.
- Initiate "adopt a stream" programs to regularly monitor and clean waterways.
- Support and participate in the Adopt-A-Mile program to maintain clean roadways and accompanying drainage channels and support on-going lake clean up efforts such as Alabama Power's Renew Our Rivers Campaign.
- Develop partnerships to increase awareness of protected species and critical habitat issues with a goal of protecting and conserving identified species.
- Organize efforts to acquire known habitat areas through land trust organizations.

Water Quality Monitoring

- Promote Alabama Water Watch training and monitoring activities as a simple way to address water quality monitoring needs.
- Work with Alabama Water Watch to encourage citizen training in visual stream assessments and to encourage participation of those not interested in water quality monitoring.

Want More Information?

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This publication is a part of the Lower Coosa River Basin Management Plan. The Plan, in its entirety, can be found at www.cleanwaterpartnership.org

Alabama
Clean Water Partnership

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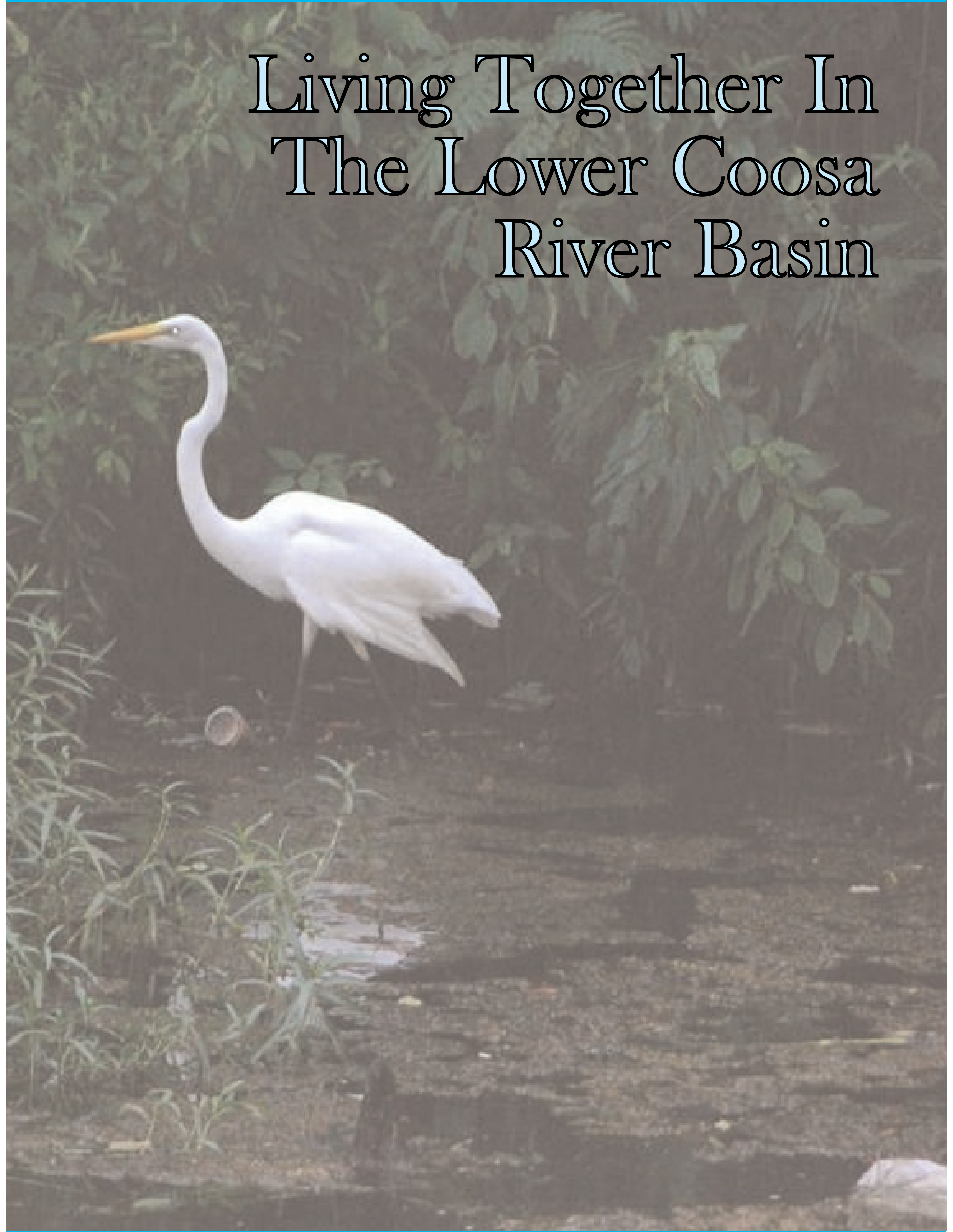
Cover Photo By Craig Lyne, Lake Jordan Resident

Living Together In The Lower Coosa River Basin



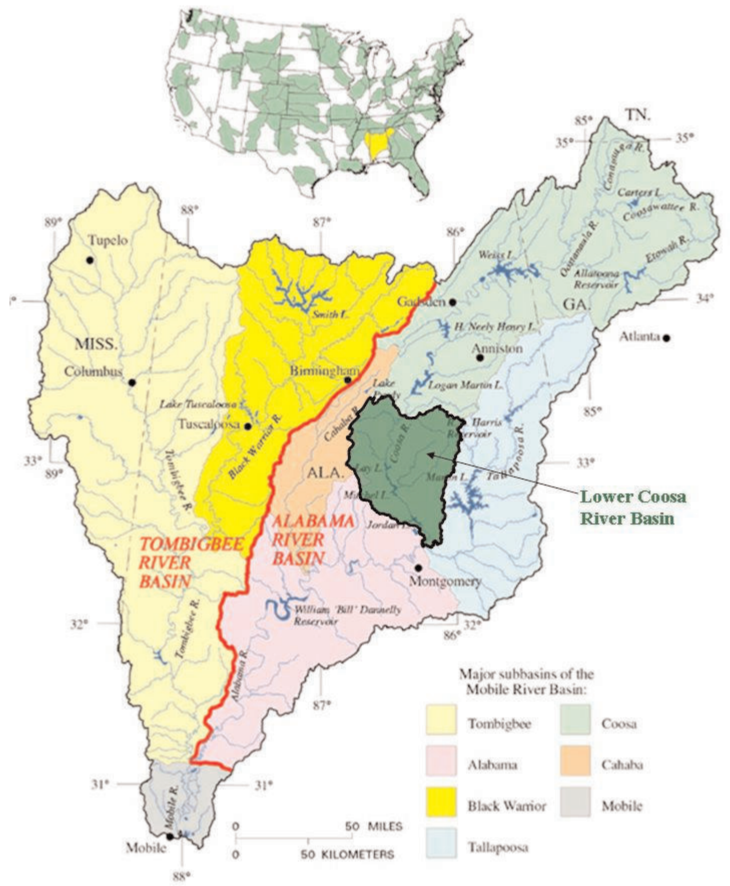
A Summary of the Lower Coosa River Basin Management Plan

June 2005

EPA United States Environmental Protection Agency

ADEM Alabama Department of Environmental Management

The Lower Coosa River Basin Within The Mobile River Basin



Source: *U.S. Geological Survey*

Do You Know Your Watershed Address?

We All Live In A Watershed

A watershed (or drainage basin) is an area of land that drains to a central location. That location can be as small as a puddle or a small drainage ditch in your backyard, or as large as a river, like the Coosa, or even as big as Mobile Bay. If you are receiving this newspaper insert, then you most likely live in one of the 20 watersheds that make up the Lower Coosa River Basin. The Coosa River Basin begins in Georgia (a small portion is even in the state of Tennessee) and ends in Elmore County, Alabama. But, the Coosa River Basin is part of a much larger river basin system -- the Mobile River Basin, which includes parts of four states and seven river systems.

How we act and what we do in our local watershed affects not only our own water quality, but the water quality of those who live further down the river system, just as we are affected by those who live upstream. A big part of maintaining good water quality is managing nonpoint source pollution -- polluted runoff. And, nonpoint source pollution is caused by everyone in their everyday activities. ***Nonpoint source pollution*** originates from land surface activities such as construction, agriculture, silviculture and urbanization. When it rains, pollutants from these and other resident activities wash into drainage ditches which then flow into small creeks and streams and finally into the Coosa River.

The Lower Coosa River Basin is made up of 20 smaller watersheds, which are identified by 11-digit hydrologic unit codes (HUCs). The State is going to a 12-digit HUC system in 2005-2006 to identify even smaller watersheds within the State's river basins. The map above shows the location of the current HUCs.

14 Cities Located In Lower Coosa River Basin

The Lower Coosa River Basin is located in the east central part of Alabama, stretching from north of Childersburg and Harpersville (where Tallassehatchee Creek meets the Coosa River) to the point where the Coosa and Tallapoosa Rivers meet to form the Alabama River south of Wetumpka. Covering approximately 1,910 square miles in size, the Lower Coosa River Basin drains parts of seven counties: Autauga, Chilton, Clay, Coosa, Elmore, Shelby and Talladega. There are 14 municipalities located within the Lower Coosa Basin. Numbers correspond to the city's location on the above map as designated by the red diamond.

Chilton County:	1. Clanton	Shelby County:	7. Calera
	2. Jemison		8. Chelsea
	3. Thorsby		9. Columbiana
Coosa County:	4. Goodwater		10. Harpersville
	5. Rockford		11. Pelham
Elmore County:	6. Wetumpka		12. Wilsonville
		Talladega County:	13. Childersburg
			14. Sylacauga

A Water Quality Improvement Program for the Lower Coosa River Basin

Temperature and Thermal Stress

Thermal stress is a result of fluctuation in water temperature that can affect aquatic habitat even in the absence of other pollution. Temperature affects the ability of water to hold oxygen, as well as the ability of organisms to resist certain pollutants. Sources, or causes, of thermal stress may include point source discharges, impervious surfaces and the removal of vegetation along stream banks.

Strategies

- Education and outreach activities
- Water quality monitoring activities
- Provide alternatives for activities

Lack of Education and Awareness

The lack of education and awareness regarding water quality in general, nonpoint source pollution (polluted runoff), and the resulting water quality issues is a concern shared by all watersheds across the Lower Coosa River Basin. The major sources of nonpoint source pollution in the basin are the individual everyday activities of residents, businesses and industries. When considered by themselves, the activities seem minor and of no consequence, but when added together across the basin, the pollutants can have damaging and long-term affects on water quality.

Strategies

- Basinwide public education campaign
- Publicize consumer, home-based actions

Endangered Species

Endangered and other protected species, identified by the U.S. Fish and Wildlife Service, are present in each watershed with as many as 46 species present in the Chestnut Creek watershed. The presence of these, as well as species that are not endangered, are good indicators of the overall health of the watershed and surrounding ecosystem. As such, a healthy aquatic community is vital to the continued health of the basin and the residents who reside there.

Strategies

- Increase public awareness
- Record and monitor sensitive habitat areas
- Protect sensitive / critical habitats
- Prevent further degradation of water quality.

Lack of Water Quality Data

Water quality data and habitat assessment is important in determining if water quality in the basin is improving, getting worse or remaining stable. In order to be efficient and cost effective, both volunteer water quality monitoring (Alabama Water Watch certified citizen monitors) and professional monitoring efforts should be combined, providing an overall picture of watershed health. Although volunteer monitoring activity is present in six of the watersheds, more sites should be monitored. The remaining 14 watersheds have no volunteer water quality monitoring activity as of November 2004. To learn more about becoming a certified citizen water quality monitor, contact Alabama Water Watch at 1-888-844-4785.

Strategies

- Increase public awareness
- Encourage municipal, industrial and citizen involvement
- Track monitoring results

The Lower Coosa River Basin Management Plan includes a full water quality improvement strategy that identifies many items that can be integrated into the everyday activities of residents and businesses. See page 12 for a summary of these protection measures and information for viewing or obtaining a copy of the Plan, as well as contact information.

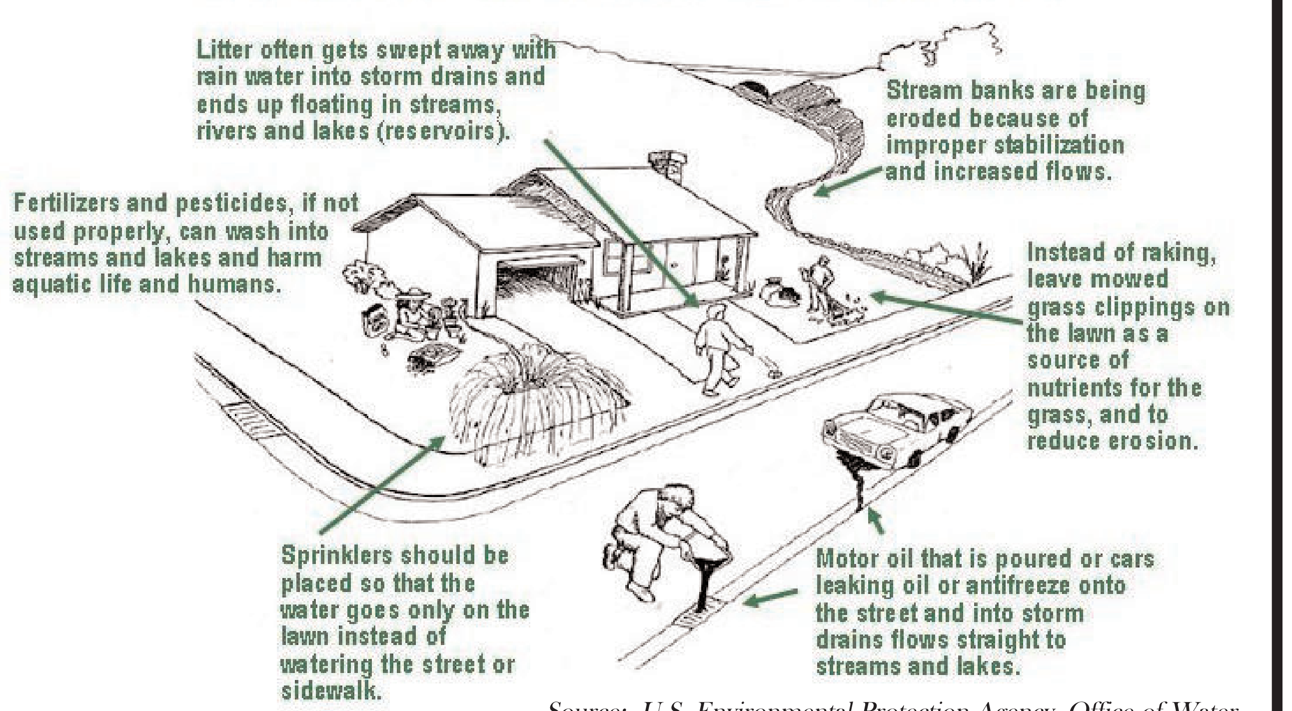
Citizens Suggest Education To Maintain Water Quality

In a series of public meetings held in May and June 2004, citizens of the Lower Coosa River Basin agreed that the key to protecting and maintaining water quality is the ongoing education of citizens, governments, businesses and industries. Stakeholders agreed that the everyday lifestyle of the residents of the Lower Coosa River Basin impacts the water resources of the basin.

Citizen responses from both phases of the education and awareness part of the planning process were instrumental in the identification of water quality issues and in the development of protection measures to address the issues.

Residents discuss water quality protection measures at public meetings in May and June 2004 in Rockford (right) and Wetumpka (bottom)

Small Actions Can Become Big Issues in Water Quality



Source: *U.S. Environmental Protection Agency, Office of Water*

Watershed Management Strategies and Protection Measures--

The Lower Coosa River Basin Management Plan development process identified 23 issues affecting the water quality of the Coosa River and the streams and creeks that flow into the river. A water quality improvement strategy was developed to address the issues and provide a practical and economical means of maintaining the beneficial uses of water in the Lower Coosa River Basin.

Some of the issues identified are regulated by the state and/or federal government and are not addressed by the Lower Coosa River Basin Management Plan, including relicensing of hydroelectric dams, priority organics (PCBs) and permitted discharges. Four issues (bacteria, flooding, turbidity and low flow) were identified in only one or two watersheds, with further studies and data needed to confirm the extent of the problem.

Protection measures were established to address the issues. A brief description of the issues and management strategies follows. The Lower Coosa River Basin Management Plan also provides a series of specific tasks to implement the water quality improvement strategy.

Growth Rate and Urban Development

Population, housing and commercial growth, traffic volume increases and urban development of previous agricultural and forested land are issues across the Basin. Population projections indicate that substantial population increases in the area are expected to continue, with a projected 49,063 additional persons in the Lower Coosa River Basin by 2025 and a projected increase of 407,000 persons in the seven-county area of the Lower Coosa River Basin by 2050. Significant impacts of the additional growth includes increased use of the Lower Coosa River water resources for household, commercial and industrial activities, increased runoff due to the increase in hard surface areas and flooding.

Strategies

- Target high growth areas with education efforts
- Water quality monitoring
- Decrease potential for sedimentation
- Development alternatives
- Basinwide public education campaign
- Publicize consumer, home-based actions

Urban Runoff / Increased Flooding

Urban runoff is an issue in watersheds located west of the Coosa River and in the northernmost and southernmost parts of the basin east of the Coosa River. The more rapid rate of stormwater runoff due to the increase of hard surfaces in urban areas can erode streambanks, cause scouring of streambeds, damage streamside vegetation, increase local flooding and widen stream channels. In addition, urbanization can also increase thermal stress, and the variety and amount of pollutants transported to receiving waters, including sediment, chemicals, nutrients, pesticides and bacteria.

Strategies

- Increased education in high growth areas
- Water quality monitoring activities
- Construction best management practices

Illegal Dumping

Illegal dumping is the disposal of trash (including litter, furniture, appliances and other household garbage, as well as animal carcasses from hunting) in an unpermitted area, such as on a stream bank, in a gully, or in other off-road areas. Littering, similar to illegal dumping but on a smaller scale, is also a problem throughout the Basin, with litter washing from roadways into Lower Coosa streams and reservoirs. Illegal dumping and littering can pollute waterways as rainfall washes over the dumped items, not to mention the ugliness of litter along roads and waterways.

Strategies

- Public education
- Support clean-up efforts
- Support regulatory programs to eliminate illegal dumping

Agricultural Runoff

Agricultural runoff was identified as an issue in watersheds that have a significant portion of the land in agricultural use. Sources of polluted runoff from agricultural activities may include overgrazing, livestock in streams, plowing, pesticide spraying, irrigation, fertilizing, and planting and harvesting. The major nonpoint source pollutants that might result from these activities, when best management practices are not implemented, are sediment, nutrients, pathogens, pesticides, and salts.

Strategies

- Target agricultural areas with education programs
- Water quality monitoring activities
- Agricultural best management practices
- Provide alternative methods of agricultural practices

Sedimentation

Sedimentation is an issue across the Basin. Soil erosion is one of the major contributors to nonpoint source pollution, with primary sources, or causes, being land disturbances from construction, urbanization, farming and forestry if best management practices are not used. Increased soil erosion causes an increase in sediment loads beyond a stream's natural carrying capacity, resulting in streambank erosion, smoothing, eroding or incising of the streambed, and unnatural channel changes.

Strategies

- Awareness of impacts of erosion and sedimentation
- Water quality monitoring
- Visual assessments
- Stormwater Management by local governments

Silviculture Runoff

Silviculture is the cultivation and harvesting of forest land, generally for timber purposes. Runoff from silviculture was cited as an issue in watersheds located in the central and northeastern parts of the Basin. Sources of polluted runoff associated with the practice of silviculture, if best management practices are not implemented, can include the removal of streamside vegetation leading to thermal pollution and sedimentation, due to road construction and maintenance, timber harvesting, and mechanical preparation for tree planting.

Strategies

- Build awareness with silviculture organizations
- Water quality monitoring
- Silviculture best management practices

Nutrients

Nutrients are compounds that stimulate plant growth, like nitrogen and phosphorus, and in high concentration can become an environmental and health threat. High nutrient levels can negatively affect dissolved oxygen levels necessary for healthy aquatic plant and animal communities. Nutrients were identified as an issue affecting ten watersheds primarily around the three reservoirs in the basin and low dissolved oxygen was identified as a regional issue affecting 11 watersheds around the reservoirs. Primary sources of nutrients are runoff from failing septic systems, fertilizers, leaves, animal waste, urban runoff, and municipal sewer systems.

Strategies

- Increase awareness of nutrient sources
- Water quality monitoring
- Implement best management practices

Land Use In The Lower Coosa River Basin

At just under 78 percent of the total land area in the Lower Coosa River Basin, the great majority of the Basin is in forest land uses. Forest land is distantly followed by agricultural land uses, at 13 percent of the total land, and urban lands, at 5 percent according to a 1999 study by the Soil and Water Conservation Districts located in the basin. These studies will be updated again in 2005. Less than 3 percent of the land area is used for mining and other purposes. In addition to the land use of the Basin, there are three reservoirs -- Jordan, Lay and Mitchell -- and four dams located along the lower portion of the Coosa River providing residents with a total of 24,650 acres of recreational waters.

Agricultural Land Uses

Approximately 164,321 acres are used for agricultural purposes, which is 2.75 percent of the total land area in the Lower Coosa River Basin.

- Pasture and hay -- 79.15 percent of agricultural land
- Crop production -- 20.85 percent of agricultural land

It is estimated that in 2001, cash receipts from agricultural land uses combined in the five counties of Chilton, Coosa, Elmore, Shelby and Talladega totaled approximately $66.4 million: $31.1 million generated by crop production; $35.3 million generated from livestock and poultry.

Data from the Natural Resource and Conservation Service (NRCS) shows that approximately 14 percent of the nonfederal rural land that was considered prime farmland in the Basin in 1982 had been converted to developed land in 1992; and, between 1992 and 1997, another 12.8 percent of the prime farmland in the basin had been developed, representing a total loss of more than a quarter of the total prime farmland in the basin in a 15-year period.

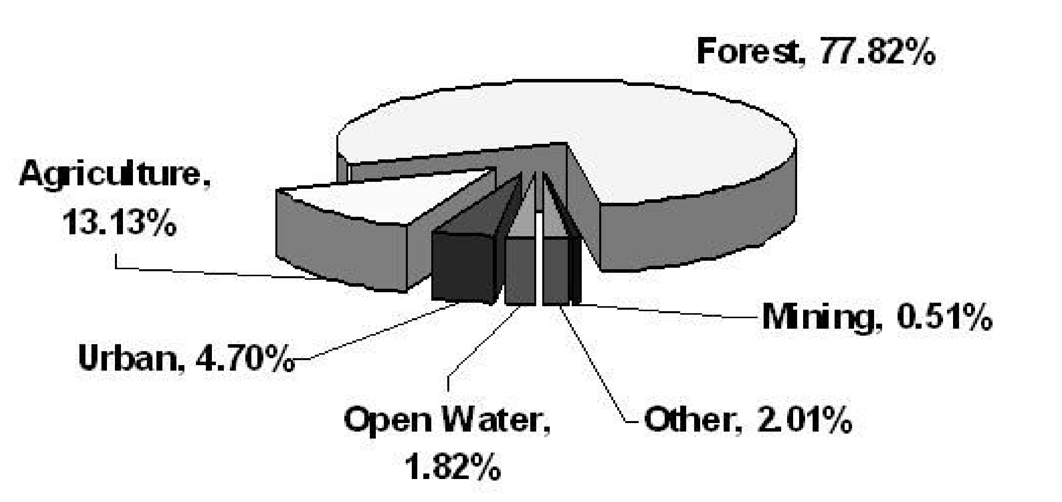
Forest Land Uses

Just under 1 million acres of land in the Lower Coosa River Basin are used for one of three types of forest land uses:

- Deciduous Forests -- 40.58 percent of the existing forest land (natural forests such as the Talladega National Forest)
- Evergreen Forests -- 23.38 percent of existing forest land (most often used for silviculture, or timber production)
- Mixed Forests -- 36.04 percent of existing forest land (land that is not yet developed, but neither is it being preserved for natural forest purposes)

Land satellite data from the U.S. Geological Survey indicates that potentially 59.42 percent of the forest land in the basin is used for silviculture, which is almost half of the total Lower Coosa River Basin area, at 46.50 percent. It is estimated that in 2001, cash receipts from timber production in Chilton, Coosa, Elmore, Shelby and Talladega Counties combined totaled just under $37 million.

Lower Coosa River Basin Land Use, 1999



Source: Alabama Soil and Water Conservation Committee, Soil and Water Conservation District Basin Assessments, 1999

Urban Land Uses

Urban land uses make up 4.70 percent of the land area of the Lower Coosa River Basin, including land developed for industrial, commercial and residential uses along with necessary infrastructure, and recreational uses.

- Residential land uses -- 42.85 percent of urban land
- Commercial, industrial, transportation -- 33.66 percent of urban land
- Recreation -- 23.50 percent of urban land

Urban land in the Basin accommodates much of the area's recent population growth. Four of Alabama's top ten ranked counties for growth between 1990 and 2000 are located in the Lower Coosa River Basin: Shelby County, which grew by 44.2 percent, was ranked first; Elmore County, which grew by 33.9 percent, was ranked third; Autauga County, which grew by 27.6 percent, was ranked seventh; and, Chilton County, which grew by 22.0 percent, was ranked tenth.

Population and Growth

The Lower Coosa River Basin is home to an estimated 109,710 people according to the U.S. Bureau of Census, 2000 Census.

- White -- 71 percent
- Black -- 27 percent
- Other races -- 2 percent
- Rural -- 75 percent
- Urban -- 25 percent

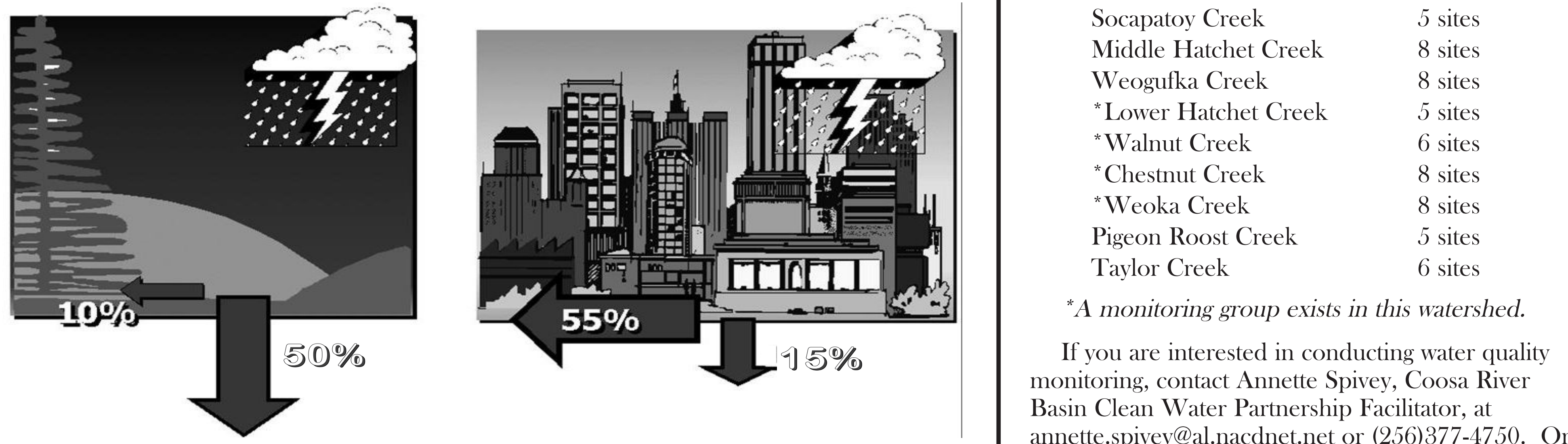
The 2000 Census shows that the population of all of the seven counties in the Basin increased between 1990 and 2000. Additionally, the proportion of the county population that is located within the Lower Coosa River Basin increased in four of the counties: Autauga, Chilton, Coosa, and Talladega, with Chilton County showing the greatest increase from 14.15 percent to 48.67 percent. A major factor in population growth inside the Lower Coosa River Basin is the proximity to one of the three lakes in the basin: Lay, Mitchell or Jordan. This assumption is supported by the high percentage of seasonal housing units located within the basin, at 37.2 percent of all vacant housing units.

USGS Report Gives Snapshot of Water Quality

In August 2004, the U.S. Geological Survey, Water Resources Division (USGS) in Montgomery conducted a one-time water quality and biological sampling to establish baseline data for comparison with future water quality and biological monitoring results in order to better gauge increases and decreases in water quality in the basin. Although conclusive determinations cannot be made from a single sampling event, it appears that urban land uses have the most detrimental affect on water quality. Evidence to this affect is seen in the small amount of urban land uses found in the basin in comparison to the quality of the water sampled at the urban sites.

Twelve streams were selected for sampling with three sites each representing the three major land-use categories on the basin: urban, forestry and agriculture. The remaining three sites were reference sites. Levels of nutrients at the sites were generally low with the exception of Darby Creek, an urban stream in Sylacauga. Eight pesticides were detected among four of the sites. All three urban sites had detections of various pesticides and one agricultural site had detections. Of the pesticides detected, five were herbicides and three were insecticides.

Benthic macroinvertebrates (stream dwelling bugs) are good indicators of conditions in streams. Invertebrates include mayflies, stoneflies and caddisflies. Stoneflies were found at all three reference sites, at none of the urban sites, at two of the silviculture sites, and at one of the agriculture sites. Stoneflies are one of the most sensitive families of invertebrates and often one of the first to be impacted by stresses on a stream.



The illustration above, from the Alabama Nonpoint Education for Municipal Officials Program, shows the increase in runoff from urban areas versus undeveloped, or natural, areas.

Volunteer Monitors Needed –

Watching Water Quality

The Lower Coosa River Basin Management Plan recommends a volunteer water quality monitoring plan as part of local watershed management efforts to develop water quality trend information. With the existing volunteer monitoring activities, an additional 135 monitors are needed in the following watersheds:

Tallasehatchee Creek	12 sites
Walthall Branch	2 sites
Yellowleaf Creek	12 sites
Kahatchee Creek	4 sites
*Beeswax Creek	4 sites
*Cedar Creek	4 sites
Peckerwood Creek	6 sites
Spring Creek	4 sites
Waxahatchee Creek	8 sites
Upper Hatchet Creek	10 sites
Socapatoy Creek	5 sites
Middle Hatchet Creek	8 sites
Weogufka Creek	8 sites
*Lower Hatchet Creek	5 sites
*Walnut Creek	6 sites
*Chestnut Creek	8 sites
*Weoka Creek	8 sites
Pigeon Roost Creek	5 sites
Taylor Creek	6 sites

**A monitoring group exists in this watershed.*

If you are interested in conducting water quality monitoring, contact Annette Spivey, Coosa River Basin Clean Water Partnership Facilitator, at annette.spivey@al.nacdnet.net or (256)377-4750. Or visit www.alabamawaterwatch.org. Alabama Water Watch will provide free training to groups.

Lower Coosa River Basin Is Home To Many Protected Species

The Lower Coosa River Basin is home to more than just its human residents. As a part of the Mobile River Basin, the Lower Coosa River Basin supports one of the most diverse aquatic flora and fauna communities in the world, including many types of freshwater fishes, mussels and snails.

According to an inventory document produced in January 1997 by the U.S. Fish and Wildlife Service (USFWS) for the Alabama-Coosa-Tallapoosa and Alabama-Chattahoochee-Flint (ACT-ACF) Comprehensive Study, there are up to 46 federally protected species present in different parts of the Lower Coosa River Basin and a minimum of 24 species present in all parts of the basin. The ACT-ACT Study cited habitat loss, new impoundments (dams) and declining water quality as the three greatest concerns for protected species. Habitat loss is most often caused by the impacts of a range of human activities, including wetland drainage, road construction, and conversion of native forest communities to urban, agricultural, and intensive silvicultural land uses. Declining water quality is most frequently attributed to sedimentation, increased nutrients and turbidity.

In July 2004, three critical habitat areas were designated within six of the 20 watersheds of the Basin. Those watersheds are Yellowleaf Creek, Upper, Middle and Lower Hatchet Creek, Pigeon Roost Creek and Taylor Creek.

Top left: Blue shiner; Bottom left: Tulatoma snail; Right: Alabama canebrake pitcher plant
Source of photos: Auburn University

Citizens Identify Issues in Lower Coosa Basin

In a series of public meetings, watershed issues and concerns affecting the Lower Coosa River Basin were derived from citizen observations and locally-identified issues, coupled with an inventory and analysis of existing conditions. The watershed issues and concerns have been categorized based on the geographical area that is impacted by the issue. Some issues affect the entire Lower Coosa River Basin, while others may affect, or be present in, one or two watersheds. Responses to a citizen survey distributed during the public meetings showed that residents thought the most common sources of polluted runoff in the Lower Coosa River Basin are urban runoff, agricultural runoff, failing onsite septic systems, illegal dumping and sedimentation. Residents further stated that the most harmful types of nonpoint source pollution are urban runoff and failing septic systems, followed distantly by illegal dumping, sedimentation and silviculture runoff. Locally identified water quality issues in the survey included pollutants, urban growth, high nutrient loads, point source discharges, and stream flow.

Approaching water quality issues from within the watershed framework promotes the connection between water quality and the affect of activities on the surrounding land on water quality. Implementation of protection measures developed within the watershed framework makes it possible to address the greatest number of causes of water quality problems rather than trying to just correct the resulting water quality in-stream through regulation and limitation of use of the water. The watershed approach addresses both land-based and water-based issues.

Lower Coosa River Basin Issues by Watershed

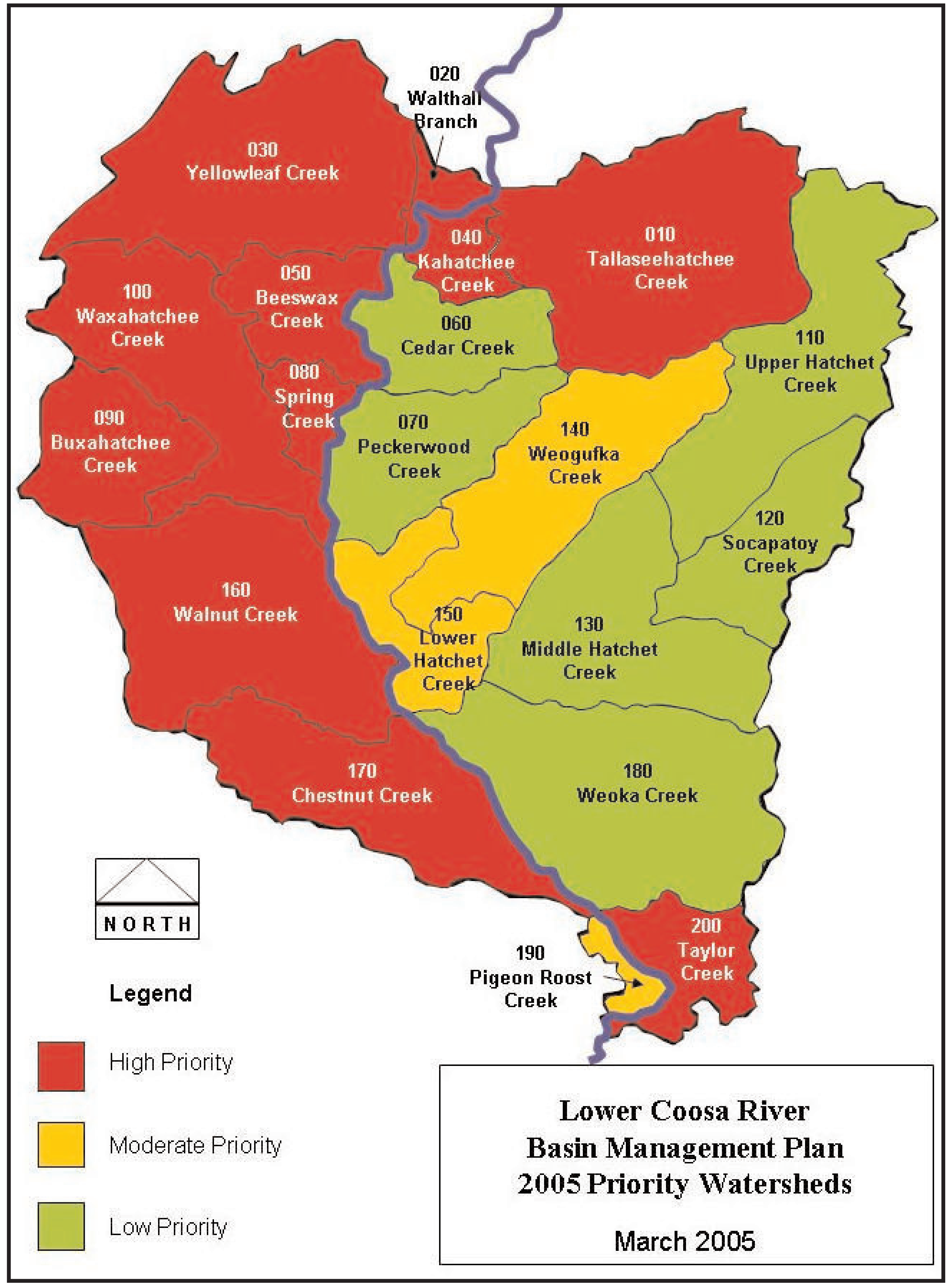
Issue	Watershed																			
	Tallassehatchee Creek	Walthall Branch	Yellowleaf Creek	Kahatchee Creek	Beeswax Creek	Cedar Creek	Peckerwood Creek	Spring Creek	Buxahatchee Creek	Waxahatchee Creek	Upper Hatchet Creek	Socapatoy Creek	Middle Hatchet Creek	Weogufka Creek	Lower Hatchet Creek	Walnut Creek	Chestnut Creek	Weoka Creek	Pigeon Roost Creek	Taylor Creek
Illegal Dumping	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Lack of Education / Awareness	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
FERC Relicensing of Hydroelectric Facilities	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Growth Rate and Urban Development		X	X		X			X	X	X						X	X	X	X	X
Agricultural Runoff	X	X	X	X	X	X		X						X		X	X		X	X
Silvicultural Runoff	X			X		X	X	X	X	X	X	X	X	X	X	X				
Urban Runoff	X	X	X	X	X			X	X	X						X	X		X	X
Sedimentation		X	X	X	X	X		X	X	X										X
Nutrients, Algae, Invasive Species					X	X	X	X	X	X					X	X	X	X		
Low Dissolved Oxygen		X		X	X	X	X	X		X					X	X	X	X		
Upstream Contamination					X	X	X	X												
Temperature and Thermal Stress							X			X					X	X	X	X		
Priority Organics (PCBs)		X		X	X	X	X	X												
Endangered Species	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Compliance with Recovery Plan for the Mobile River Basin Aquatic Ecosystem	X		X						X		X		X	X	X				X	X
Designation as a Critical Habitat			X								X		X		X				X	X
Lack of Water Quality Trend Data	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Mining Runoff				X		X	X		X	X										
Bacteria												X						X		
Turbidity																		X	X	
Flooding																		X	X	
Point Source Discharges	X	X			X				X				X							
Low Flow					X															

Priority Watersheds Identified In The Lower Coosa River Basin

Using an 18-factor rating system and incorporating citizen comments and concerns, the watersheds of the Lower Coosa River Basin were ranked as high, moderate or low priority. The priority rating system used factors drawn from the existing physical, structural, economic and cultural features of the watershed, as well as from the identification of characteristics that need to be protected, i.e., sensitive features.

For each rating factor, a watershed received a score between one and five, with one having the least potential for a negative impact on water quality and five having the highest potential for a negative impact on water quality or a more significant presence of sensitive features. Factors that were used include:

- Impaired Water Bodies
- ADEM Assessment Rating for NPS
- SWCD Priority Watershed
- Alabama Water Watch Citizen Water Quality Monitoring and Results
- Use Classification
- Land Use Character
- Potential for Silviculture
- Sediment Load Ratio
- Animal Density
- Soil Suitability for Development
- Growth Rate of County
- Increase in Traffic Volume
- Number of Permitted Dischargers
- Presence of Hydroelectric Dam
- Housing Density
- Septic System Density
- Number of Endangered Species
- 2000 Unemployment Rate



The ranking resulted in six low priority watersheds, three moderate priority watersheds and eleven high priority watersheds. Watersheds ranked as a high priority have the most features that could have a negative impact on water quality within the watershed, such as a significant amount of urban land uses, and/or the highest number of features to be safeguarded, such as endangered species. Watersheds categorized as a low priority watershed have the fewest features with potential for negative impacts on water quality or the fewest features to be protected. Even in the low priority watersheds, factors do exist which may impact water quality in a negative manner if not managed correctly. Therefore, the low priority watersheds are also in need of watershed management measures, although the urgency may not be as great as in high priority watersheds.

High priority watersheds are located across the northern, western and southern parts of the basin, while the low and moderate priority watersheds are in the east central part of the basin. This pattern reflects the urbanization patterns west of the Coosa River and the location of the Talladega National Forest and lower population densities east of the Coosa River.

Benefits of Lower Coosa River To Basin Residents

Alabama has always been considered a water abundant state. During the droughts of the late 1980's, however, it became apparent that certain water problems were not drought related. That realization created a new awareness among water resource managers that the quality and quantity of this important resource had to be protected.

"Access to water determines the economic prosperity and quality of life in all cultures." Neither Alabama nor the Lower Coosa River Basin are exceptions to this statement made in 1991 by the Alabama Water Resources Study Commission. Water is a resource that impacts all facets of the lives of residents in the Basin.

Agricultural Use

Agricultural uses of water in the Lower Coosa River Basin include crop irrigation (corn, cotton, peach orchards) and water for farm animals. Sod and timber are also considered agricultural products. The number and size of farms in the five predominant counties of the Lower Coosa River Basin are as follows:

County	# Farms	Acres In Farms	Average Size
Chilton	663	98,746	149
Coosa	213	41,716	196
Elmore	560	124,260	222
Shelby	435	68,421	157
Talladega	523	109,560	209

Source: Census of Agriculture, 1997

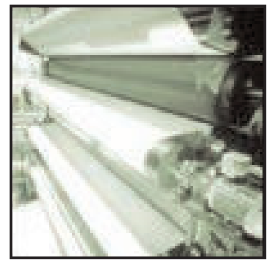
These farms provide a significant economic base for the Lower Coosa River Basin, with 2001 cash receipts for farm and forestry in Chilton, Coosa, Elmore, Shelby and Talladega Counties totaling more than $118.9 million, according to the 2001 Agricultural Statistics. Total cash receipts for these five counties in the basin from crops was $31,136,000; from livestock and poultry was $35,346,000; and from forest products was $36,970,000.

Municipal Water Uses

Municipal and private water systems, along with private wells, in the Lower Coosa River Basin provide domestic water for household purposes, lawn irrigation, and certain recreational activities such as filling and maintaining swimming pools. Municipal water use also includes lost water used for fire fighting and losses due to broken or leaking water lines. There are six permitted water supply systems within the Lower Coosa River Basin.

Industrial Use

Industrial water use in the Lower Coosa River Basin includes water used in industrial processes, cooling water and water used by employees during their respective work shifts. Of all the employment sectors, manufacturing employs the greatest percentage of the labor force in the Lower Coosa River Basin, at just over 20 percent.



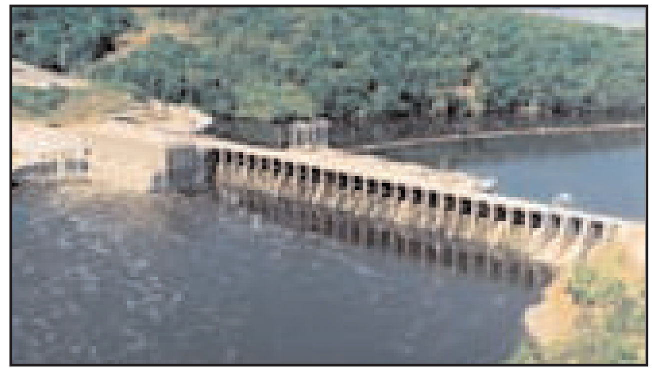
Commercial Navigation

Commercial navigation in the Lower Coosa River Basin is limited by dams. Commercial use of the existing river can be made between dams for either the movement of goods or commercial passenger services such as sight seeing and river boat rides. At the present time the Coosa River, north of Montgomery, is still authorized for the development of a navigable waterway from Montgomery, Alabama to Rome, Georgia.

Hydroelectric Power Generation

Power generation uses of water in the Lower Coosa River Basin are primarily in-stream use to produce hydropower at Bouldin, Jordan, Mitchell and Lay dams. All of these facilities (dams) are operated by the Alabama Power Company and are primarily utilized to generate electricity for peak power periods.

Slightly upstream from the Lower Coosa River Basin at the Gaston steam plant, water is withdrawn for cooling purposes and then returned to the river.



Waste Assimilation

The Lower Coosa River Basin, primarily in the tributaries, is also used for waste assimilation. Permitted discharges are made at sewage treatment plants and large industries. There are a total of 42 permitted waste discharges in the Lower Coosa River Basin, of which five are municipal, 33 are industrial and four are mining. Although permitted, temporary stormwater discharge construction activities are not included in this category.

Recreation

Recreational use of water in the lower Coosa River basin is dominated by the activities related to Jordan, Mitchell and Lay Lakes. These uses include a variety of recreational boating, fishing including major tournaments, and water contact sports such as skiing and swimming. A conservative estimate is that there are about 8,718 registered boats in the Lower Coosa River Basin and 2,723 vacant seasonal housing units.

Photo Credits:
Agriculture: Delaney Consultant Services, Inc.
Municipal: City of Childersburg Water Department
Industrial: Bowater website
Hydroelectric: Alabama Power Company
Recreation: Alabama Department of Environmental Management

Potential Sources of Polluted Runoff In The Lower Coosa River Basin


Hatchet Creek near Rockford

Water is the lifeblood of the Lower Coosa River Basin and Alabama. It enables human existence; provides a fundamental service for communities; provides present and future economic opportunities; and sustains the environment around individuals and communities that create the quality of life that the residents of the Lower Coosa River Basin enjoy on a daily basis. Protecting the quality of the water in the Lower Coosa River is important to the continued existence of that quality of life. A factor in maintaining water quality is decreasing and managing the nonpoint source pollution that every resident of the Basin creates.

Nonpoint source pollution is pollution caused by sediments, nutrients and organic and toxic substances originating from land use activities and/or from the atmosphere, which are washed into rivers and streams by stormwater runoff at a rate that exceeds natural levels. While the impact of each individual source is perceived by the public as being small, the cumulative effect is significant. That is why awareness needs to be created in all citizens. The effect on water quality is not only felt locally, but also by downstream users and ultimately in the bays and oceans that major river systems drain into.

There are a number of different types and sources of nonpoint source pollution. The following outlines some types and sources that can be found in the Lower Coosa River Basin.

Urban Runoff. Nonpoint source pollution from urban runoff occurs when water flows over surfaces into storm drains that empty into nearby creeks, streams and rivers. The porous and varied terrain of natural landscapes like forests, wetlands, and grasslands trap rainwater and allow it to slowly filter into the ground. Runoff tends to reach receiving waters gradually. Nonporous urban landscapes like roads, bridges, parking lots, and buildings don't let runoff slowly soak into the ground. Instead, water runs off in large amounts. The increased volume and flow of runoff can erode streambanks, damage streamside vegetation and widen stream channels.


Storm sewers channel urban runoff from roads and other impervious surfaces.

Urbanization also increases the variety and amount of nonpoint source pollution. Sediment from development and new construction; oil, grease, and toxic chemicals from automobiles; nutrients and pesticides from turf management and gardening; viruses and bacteria from failing septic systems and pet waste; and heavy metals are examples of pollutants generated in urban areas. When runoff enters storm drains, it carries many of these pollutants with it.

Failing Septic Systems. One of the most common causes of nonpoint source pollution at the household level is failing septic systems. Failing septic systems release bacteria and nutrients into the water, contaminating nearby lakes and streams, and groundwater. Septic systems must be built in the right place and maintained properly to eliminate their impact on nearby waters. Signs of failing septic systems can include sewage surfacing on the ground near the tank or drainfield or spongy ground. In 1999, it was estimated that 6.2 percent of the approximate 16,220 septic systems in the Lower Coosa River Basin were failing.


Signs of failing septic systems in Talladega County.

Illegal Dumping. Another household source of nonpoint source pollution is illegal dumping, which is the disposal of waste in an unpermitted area, such as a back area of a yard, a stream bank, or some other off-road area. Illegal dumping can also be the pouring of liquid wastes or disposing of trash down storm drains. Runoff from dumpsites containing chemicals can contaminate wells and surface water used as sources of drinking water. Substances disposed of directly into storm drains can also lead to water quality impairment.


An illegal dump site found near Shirtee Creek in Talladega County.

Agricultural Runoff. Agricultural land uses in the Lower Coosa River Basin present a major potential for nonpoint source pollution if best management practices are not used. Agricultural activities that cause nonpoint source pollution include confined animal facilities, grazing, plowing, pesticide spraying, irrigation, fertilizing, planting, and harvesting. The major nonpoint source pollutants that result from these activities are sediment, nutrients, pathogens, pesticides, and salts. Agricultural activities also can damage habitat and stream channels.

Silviculture. Road construction and road use are the primary sources of nonpoint source pollution on forested lands, contributing up to 90 percent of the total sediment from forestry operations. Without implementation of best management practices, several water quality impacts may be felt from silviculture. Harvesting trees in the area beside a stream can affect water quality by reducing the streambank shading that regulates water temperature and by removing vegetation that stabilizes the streambanks. These changes can harm aquatic life by limiting sources of food, shade, and shelter. Limbs and other trimmings dumped into streams from harvesting operations can also demage water quality by adding excessive organic matter and robbing it of oxygen. Most detrimental effects of timber harvesting are related to the access and movement of vehicles and machinery, and the dragging and loading of trees or logs. These effects include soil disturbance, soil compaction, and direct disturbance of stream channels.


Logging roads for silviculture in Coosa County.

Sedimentation. Erosion and sedimentation occur when wind or water runoff carry soil particles to a stream or lake. Although soil erosion is a natural process, it can be greatly accelerated when soil is disturbed by construction, urbanization, farming and forestry and best management practices are not implemented. Excessive sedimentation clouds the water, which reduces the amount of sunlight reaching aquatic plants; covers fish spawning areas and food supplies; and clogs the gills of fish. In addition, other pollutants like phosphorus, pathogens, and heavy metals are often attached to the soil particles and wind up in the water bodies with the sediment.


Sedimentation buildup in a stream bed in Shelby County.

Water-Related Recreational Activities. Most water-related recreational activities are boat-oriented. Individual boats and marinas may release only small amounts of pollutants, but the cumulative effects can cause water quality problems. Potential impacts from boating and marinas include high toxicity in the water, increased pollutant concentrations in aquatic organisms and sediments, increased erosion rates, increased nutrients leading to an increase in algae and a decrease in oxygen, and high levels of pathogens.

The discharge of sewage and waste from boats can degrade water quality. Sewage discharged from boats can cause severe human health threats and also stimulate algae growth.


Boating and fishing, popular pastimes, also present potential for nonpoint source pollution.

Resource Extraction. Mining can be both a point source and a nonpoint source of pollution. Although only a small area of the land surface is disturbed by mining, the impacts of improperly managed sites on surface water can be significant. The most common form of pollution from mining is sediment. Surface mining creates large areas of disturbed land which are often highly erodible.

Pathogens, Nutrients and Toxins. Pathogens are disease-causing microorganisms, such as bacteria and viruses, that come from the fecal waste of humans and animals. Exposure to pathogens, either from direct contact with water or through ingestion of contaminated raw shellfish, can cause a variety of illnesses. Pathogens wash off the land from wild animals, farm animals, and pet wastes, and can also enter our waterways from improperly functioning septic tanks, leaky sewer lines and boat sanitary disposal systems.

Nutrients are compounds that stimulate plant growth, like nitrogen and phosphorous. Under normal conditions, nutrients are beneficial and necessary, but in high concentrations, they can become an environmental threat. Nutrients in polluted runoff can come from agricultural fertilizers, failing septic systems, home lawn care products, and yard and animal wastes.

Toxic contaminants are substances that can harm the health of aquatic life and/or human beings. These contaminants are created by a wide variety of human practices and products, and include heavy metals, pesticides, and organic compounds like PCBs. Some toxins are very resistant to breakdown and tend to be passed through the food chain to be concentrated in top predators. Fish consumption health advisories are the result of concern over some toxins. Oil, grease and gasoline from roadways, and chemicals used in homes, gardens, yards, and on farm crops, are also sources of toxic contaminants.

Thermal Stress. Water temperature affects aquatic habitat even in the absence of other pollution. Fish and other species are sensitive to temperature and inhabit areas where the temperature falls within their preferred range. Cooler water also retains more oxygen. Two of the primary causes of thermal stress are increases in the amount of pervious surfaces in a watershed (rooftops, paving) and the removal of trees, which provide shade, from streambanks.


Invasive plant species on Lake Jordan.

Lower Coosa River
Basin Management Plan

May 2005

Alabama
Clean
Water
Partnership

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Special thanks are extended to the many stakeholders of the Lower Coosa River Basin for their help with this project; and, especially to Bob Grasser for his perspectives, experience and his tireless dedication well into retirement in completing the project.

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Document Contents

Preface

The Lower Coosa River Basin Management Plan actually consists of three documents. The first is a summary of the basin management plan, entitled Living Together in the Lower Coosa River Basin. This 12-page document was published in five newspapers with the basin area for a total circulation reach of approximately 34,000 residents. Additional copies of the summary were printed for distribution by the Alabama Clean Water Partnership, the Lower Coosa Clean Water Partnership, the home owner and boat owner associations in the basin, and other organizations. The purpose of the summary is to provide a brief overview of the full plan and to provide watershed management steps that can be taken by individuals to safeguard water quality.

The second document is the full Lower Coosa River Basin Management Plan, which is divided into three parts. The first part is an inventory of the physical and structural features of the basin boundaries; the second part is a review and discussion of water quality factors that are relevant to the Lower Coosa River Basin; and, the third part is a water quality improvement program. In the water quality improvement program, the 20 subwatersheds of the Lower Coosa River Basin are prioritized, water quality issues are identified and strategies and tasks are outlined for protecting water quality. A fourth part of the Plan is the appendices which includes an abstract of all federally protected species that have a distribution range in the Lower Coosa River Basin. Information in the Lower Coosa River Basin Management Plan is generally provided at an 8-digit HUC level for the entire basin.

For more detailed information residents and concerned citizens can refer to the third document, which is an Atlas of Watersheds. This document provides information at the watershed level and as well as information about the existing conditions in each watershed that may affect the water quality of the basin overall. Information included in the Atlas for each watershed includes land use, soil types, endangered species, animal populations, demographics, housing and economic data, as well as the results of a watershed rating system and an outline of the watershed management issues that are present within each watershed.

Together, the Summary, the Plan, and Atlas provide a holistic perspective of the Lower Coosa River Basin and its individual parts. By using the documents together, individuals, citizens groups, local governments, businesses and industries can work separately or jointly to each do their part to improve, protect and maintain the water quality of the Lower Coosa River so that generations to come may continue to depend upon and enjoy this part of Alabama’s vast river network.

Acronyms and Abbreviations

A&I	Agriculture and Industry (water supply use classification)
AAES	Alabama Agricultural Experiment Station
ACA	Alabama Cattleman's Association
ACES	Alabama Cooperative Extension System
ADAI	Alabama Department of Agriculture and Industries
ADCNR	Alabama Department of Conservation and Natural Resources
ADE	Alabama Department of Education
ADECA	Alabama Department of Economic and Community Affairs
ADEM	Alabama Department of Environmental Management
ADIR	Alabama Department of Industrial Relations
ADOT	Alabama Department of Transportation
ADPH	Alabama Department of Public Health
AEC	Alabama Environmental Council
AEMC	Alabama Environmental Management Commission
AEPA	Alabama Egg and Poultry Association
AFA	Alabama Forestry Association
AFC	Alabama Forestry Commission
AFO	Animal Feeding Operation
AGCA	Associated General Contractors of Alabama
AHBA	Alabama Home Builders Association
ALFA	Alabama Farmers Federation
ANHP	Alabama Natural Heritage Program
APC	Alabama Power Company
ARA	Alabama Rivers Alliance
ARS	Agricultural Research Service
ASG	Alabama Sea Grant Extension Program

ASMC	Alabama Surface Mining Commission
ASSESS	ADEM Strategy for Sampling Environmental Indicators of Surface Water Quality Status
ASWCC	Alabama Soil and Water Conservation Committee
ASWCD	Alabama Soil and Water Conservation Districts
AWF	Alabama Wildlife Federation
AWPCA	Alabama Water Pollution Control Act
AWRI	Alabama Water Resources Institute
AWW	Alabama Water Watch
AWWA	Alabama Water Watch Association
BMP	Best Management Practices
BSA/GSA	Boy and/or Girl Scouts of America
CAC	Citizen Advisory Committee
CAFO	Confined Animal Feeding Operation
CAWV	Certified Animal Waste Vendor
CBEP	Community Based Environmental Protection
CERS	Center for Environmental Research and Service - Troy State University
CLP	Clean Lakes Program
CNPCP	Coastal Nonpoint Pollution Control Program
Co-Ag (AU)	College of Agriculture - Auburn University
COE	United States Army Corps of Engineers
CPESC	Certified Professional in Erosion and Sediment Control
CRP	Conservation Reserve Program
CSGWPP	Comprehensive State Groundwater Protection Plan
CVA	Clean Vessel Act
CWA	Clean Water Act
CWAP	Clean Water Action Plan
CZARA	Coastal Zone Act Reauthorization Amendments
CZMA	Coastal Zone Management Act
DO	Dissolved Oxygen
EMAP	Environmental Monitoring Assessment Program
EPA	U.S. Environmental Protection Agency
EQIP	Environmental Quality Incentives Program
EWP	Emergency Watershed Protection Program
F&W	Fish and Wildlife (water supply use classification)

FIP	Forestry Incentives Program
FSA	Farm Services Agency
FWPCA	Federal Water Pollution Control Act
GIS	Geographical Information System
GPS	Global Positioning System
GSA	Geological Survey of Alabama
HBAA	Home Builders Association of Alabama
HOBOs	Homeowners and Boat Owners Association
IECA	International Erosion Control Association
IPM	Integrated Pest Management
MOA	Memorandum of Agreement
NEP	National Estuary Program
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NPS	Nonpoint Source
NRCS	Natural Resources Conservation Service
NWI	National Wetland Inventory of the USFWS
OAW	Outstanding Alabama Water (water use classification)
ONRW	Outstanding National Resource Water (water use classification)
OSM	United State Bureau of Mines - Office of Surface Mining
PALS	People Against A Littered State
PS	Point Source
PWS	Public Water Supply (water use classification)
RC&D	Resource Conservation and Development
RWC	Receiving Water Concentration
S	Swimming and Other Whole Body Water Contact Sports (water use classification)
SH	Shellfish Harvesting (water use classification)
SMZ	Streamside Management Zone
SNA	Southern Nurserymen's Association
SOP	Standard Operating Procedures
SRF	State Revolving Fund of Alabama
SWCC&D	Soil and Water Conservation Commission and Districts
SWCD	Soil and Water Conservation District

SWCP	State Wetland Conservation Plan
SWCS	Soil and Water Conservation Society
TMDL	Total Maximum Daily Loads
TNC	The Nature Conservancy of Alabama
TSI	Trophic State Index
TVA	Tennessee Valley Authority
USACE U.S.	Army Corps of Engineers (a.k.a. COE)
USCOE	United States Army Corps of Engineers
USDA	U.S. Department of Agriculture
USDA-FS	United States Department of Agriculture - Forest Service
USDA-NRCS	Natural Resources Conservation Service
USDI	United States Department of the Interior
USEPA	United States Environmental Protection Agency
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service (Department of the Interior)
USGS	United States Geological Survey
UWA	University of West Alabama
VOC	Volatile Organic Compound
WBNEC	Weeks Bay National Estuarine Center
WBNERR	Weeks Bay National Estuary Research Reserve
WCAMI	Wetlands Conservation and Management Initiative
WHIP	Wildlife Habitat Incentives Program
WMA	Watershed Management Authorities
WRP	Wetlands Reserve Program

Glossary

This glossary was derived from the U.S. Geological Survey, General Introduction and Hydrologic Definitions, Manual of Hydrology: Part 1. General Surface-Water Techniques, by W. B. Landgbein and Kathleen T. Iseri. The USGS references have been deleted. For more information or more detail, refer to the USGS website at http://water.usgs.gov/wsc/glossary.html.

Ablation. The process by which ice and snow waste away owing to melting and evaporation.
Absorption. The entrance of water into the soil or rocks by all natural processes. It includes the *infiltration* of precipitation or snowmelt, gravity flow of streams into the valley alluvium (see Bank storage) into sinkholes or other large openings, and the movement of atmospheric moisture.
Acre-foot. A unit for measuring the volume of water, is equal to the quantity of water required to cover 1 acre to a depth of 1 foot and is equal to 43,560 cubic feet or 325,851 gallons. The term is commonly used in measuring volumes of water used or stored.
Anabranch. A diverging branch of a river which reenters the mainstream.
Anchor ice. Ice in the bed of a stream or upon a submerged body or structure.
Annual flood. The highest peak discharge in a water year.
Annual flood series. A list of annual floods.
Antecedent precipitation index. An index of moisture stored within a drainage basin before a storm.
Area-capacity curve. A graph showing the relation between the surface area of the water in a reservoir and the corresponding volume.
Average discharge. In the annual series of the Geological Survey's reports on surface-water supply--the arithmetic average of all complete water years of record whether or not they are consecutive. Average discharge is not published for less than 5 years of record. The term "average" is generally reserved for average of record and "mean" is used for averages of shorter periods, namely, daily mean discharge.

Backwater. Water backed up or retarded in its course as compared with its normal or natural condition of flow. In *stream gaging*, a rise in *stage* produced by a temporary obstruction such as ice or weeds, or by the flooding of the stream below. The difference between the observed stage and that indicated by the *stage-discharge relation*, is reported as backwater.
Bank. The margins of a *channel.* Banks are called right or left as viewed facing in the direction of the flow.

Bankfull stage. Stage at which a stream first overflows its natural banks. *(See also* Flood stage. Bankfull stage is a hydraulic term, whereas flood stage implies damage.)
Bank storage. The water absorbed into the banks of a stream channel, when the stages rise above the water table in the bank formations, then returns to the channel as effluent seepage when the stages fall below the water table.
Base discharge (for peak discharge). In the Geological Survey's annual reports on surface-water supply, the discharge above which peak discharge data are published. The base discharge at each station is selected so that an average of about three peaks a year will be presented. (*See also* Partial-duration flood series.)
Base flow. *See* Base runoff.
Base runoff. Sustained or fair weather runoff. In most streams, base runoff is composed largely of groundwater effluent. The term *base flow is* often used in the same sense as base runoff. However, the distinction is the same as that between streamflow and runoff. When the concept in the terms *base flow* and base runoff is that of the natural flow in a stream, base runoff is the logical term. *(See also Ground-water runoff and* Direct runoff.)
Basic hydrologic data. Includes inventories of features of land and water that vary only from place to place (topographic and geologic maps are examples), and records of processes that vary with both place and time. (Records of precipitation, streamflow, ground-water, and quality-of-water analyses are examples.)
Basic hydrologic information is a broader term that includes surveys of the water resources of particular areas and a study of their physical and related economic processes, interrelations and mechanisms.
Basic-stage flood series. *See* Partial duration flood series.
Braiding of river channels. Successive division and rejoining (of riverflow) with accompanying islands is the important characteristic denoted by the synonymous terms, braided or anastomosing stream. A braided stream is composed of *anabranches.*

Catchment area. *See* Drainage basin.
Cfs. Abbreviation of *cubic feet per second* .
Cfs-day. The volume of water represented by a flow of 1 cubic foot per second for 24 hours. It equals 86,400 cubic feet, 1.983471 acre-feet, or 646,317 gallons.
Cfsm (cubic feet per second per square mile). The average number of cubic feet of water per second flowing from each square mile of area drained by a stream, assuming that the runoff is distributed uniformly in time and area.
Channel (watercourse). An open conduit either naturally or artificially created which periodically or continuously contains moving water, or which forms a connecting link between two bodies of water. River, creek, run, branch, anabranch, and tributary are some of the terms used to describe natural channels. Natural channels may be single or braided *(see* **Braiding of river channels**) . Canal and floodway are some of the terms used to describe artificial channels.
Channel storage. The volume of water at a given time in the *channel* or over the *flood plain* of the *streams* in a *drainage basin* or river *reach.* Channel storage is great during the progress of a *flood event.*
Climate. The sum total of the meteorological elements that characterize the average and extreme condition of the atmosphere over a long period of time at any one place or region of

the earth's surface. The collective state of the atmosphere at a given place or over a given area within a specified period of time.
Climatic year. A continuous 12-month period during which a complete annual cycle occurs, arbitrarily selected for the presentation of data relative to hydrologic or meteorologic phenomena. The climatic year is usually designated by the calendar year during which most of the 12 months occur. (*See* Water year.)
Cloudburst. A torrential downpour of rain, which by its spottiness and relatively high intensity suggests the bursting and discharge of a whole cloud at once.
Concentration time. *See* Time of concentration.
Concordant flows. Flows at different points in a river system that have the same *recurrence interval,* or the same frequency of occurrence. It is most often applied to flood flows.
Condensation. The process by which water changes from the vapor state into the liquid or solid state. It is the reverse of evaporation.
Conservation storage. Storage of water for later release for useful purposes such as municipal water supply, power, or irrigation in contrast with storage capacity used for flood control.
Consumptive use. The quantity of water absorbed by the crop and transpired or used directly in the building of plant tissue together with that evaporated from the cropped area. The quantity of water transpired and evaporated from a cropped area or the normal loss of water from the soil by evaporation and plant transpiration. (*see also* Water requirement)
The quantity of water discharged to the atmosphere or incorporated in the products of the process in connection with vegetative growth, food processing, or an industrial process
Consumptive use, net. The consumptive use decreased by the estimated contribution by rainfall toward the production of irrigated crops. *(See* Effective precipitation (3).) Net consumptive use is sometimes called crop irrigation requirement.
Consumptive waste. The water that returns to the atmosphere without benefiting man.
Contents. The volume of water in a reservoir. Unless otherwise indicated reservoir content is computed on the basis of a level pool and does not include *bank storage*.
Control. A natural constriction of the channel, a long reach of the channel, a stretch of rapids, or an artificial structure downstream from a *gaging station* that determines the *stage-discharge relation* at the gage. A control may be complete or partial. A complete control exists where the stage-discharge relation at a gaging station is entirely independent of fluctuations in stage downstream from the control. A partial control exists where downstream fluctuations have some effect upon the stage-discharge relation at a gaging station. A control, either partial or complete, may also be shifting. Most natural controls are shifting to a degree, but a shifting control exists where the stage discharge relation experiences frequent changes owing to impermanent bed or banks.
Correlation. The process of establishing a relation between a variable and one or more related variables. Correlation is simple if there is only one independent variable; multiple, if there is more than one independent variable. For gaging station records, the usual variables are the short-term gaging-station record and one or more long-term gaging-station records.
Correlative estimate. A discharge determined by correlation. A correlative estimate represents a likely valueof the discharge for any particular period--commonly a month--according to a specified method of analysis.
Cryology. Science of ice and snow.

Cubic feet per second. A unit expressing rates of discharge. One cubic foot per second is equal to the discharge of a stream of rectangular cross section, 1 foot wide and 1 foot deep, flowing water an average velocity of 1 foot per second.
Current meter. An instrument for measuring the speed of flowing water.
Cycle. A regularly recurring succession of events such as the cycle of the seasons. Use of cycle to describe a group of wet years followed or preceded by a group of dry years is to be avoided.

Dead storage. The volume in a reservoir below the lowest controllable level.
Dependable yield, *n*-years. The minimum supply of a given water development that is available on demand, with the understanding that lower yields will occur once in *n* years, on the average.
Depletion. The progressive withdrawal of water from surface- or ground-water reservoirs at a rate greater than that of replenishment. (*see* Recession curve *and* streamflow depletion.)
Depression storage. The volume of water contained in natural depressions in the land surface, such as puddles.
Direct runoff. The runoff entering stream channels promptly after rainfall or snowmelt. Superposed on *base runoff,* it forms the bulk of the hydrograph of a *flood*. *See also* **surface runoff**. The terms *base runoff* and *direct runoff* are time classifications of runoff. The terms *ground-water runoff* and *surface runoff* are classifications according to source.
Discharge. In its simplest concept discharge means outflow; therefore, the use of this term is not restricted as to course or location, and it can be applied to describe the flow of water from a pipe or from a drainage basin. If the discharge occurs in some course or channel, it is correct to speak of the discharge of a canal or of a river. It is also correct to speak of the discharge of a canal or stream into a lake, a stream, or an ocean. *(See also* Streamflow *and* Runoff.)
Discharge rating curve. *See* Stage discharge relation.
Distribution graph (distribution hydrograph). A *unit hydrograph* of *direct runoff* modified to show the proportions of the volume of runoff that occurs during successive equal units of time.
Diversion. The taking of water from a stream or other body of water into a canal, pipe, or other conduit.
Double-mass curve. A plot on arithmetic cross-section paper of the cumulated values of one variable against the cumulated values of another or against the computed values of the same variable for a concurrent period of time.
Drainage area. The drainage area of a stream at a specified location is that area, measured in a horizontal plane, which is enclosed by a drainage divide.
Drainage basin. A part of the surface of the earth that is occupied by a drainage system, which consists of a surface stream or a body of impounded surface water together with all tributary surface streams and bodies of impounded surface water.
Drainage density. Length of all *channels* above those of a specified *stream order* per unit of *drainage area*.
Drainage divide. The rim of a *drainage basin*. *(See* Watershed.)
Drought. A period of deficient precipitation or runoff extending over an indefinite number of days, but with no set standard by which to determine the amount of deficiency needed to

constitute a drought. Thus, there is no universally accepted quantitative definition of drought; generally, each investigator establishes his own definition.
Duration curve. *See* Flow-duration curve for one type.

Effective precipitation (rainfall). 1. That part of the precipitation that produces runoff. 2. A weighted average of current and antecedent precipitation that is "effective" in correlating with runoff. 3. As described by U.S. Bureau of Reclamation (1952, p. 4), that part of the precipitation falling on an irrigated area that is effective in meeting the *consumptive use* requirements.
Epilimnion. *See* thermal stratification.
Evaporation. The process by which water is changed from the liquid or the solid state into the vapor state. In hydrology, evaporation is vaporization that takes place at a temperature below the boiling point.
Evaporation opportunity (relative evaporation). The ratio of the rate of evaporation from a land or water surface in contact with the atmosphere, to the *evaporativity* under existing atmospheric conditions. It is the ratio of actual to potential rate of evaporation, generally stated as a percentage. The opportunity for a given rate of evaporation to continue is determined by the available moisture supply.
Evaporation pan. An open tank used to contain water for measuring the amount of evaporation. The U.S. Weather Bureau class *A* pan is 4 feet in diameter, 10 inches deep, set up on a timber grillage so that the top rim is about 16 inches from the ground. The water level in the pan during the course of observation is maintained between 2 and 3 inches below the rim.
Evaporation, total. The sum of water lost from a given land area during any specific time by transpiration from vegetation and building of plant tissue; by evaporation from water surfaces, moist soil, and snow; and by interception. *** It has been variously termed "evaporation," "evaporation from land areas," "evapotranspiration," "total loss," "water losses," and "fly off."
Evaporativity (potential rate of evaporation). The rate of evaporation under the existing atmospheric conditions from a surface of water that is chemically pure and has the temperature of the atmosphere.
Evapotranspiration. Water withdrawn from a land area by *evaporation* from water surfaces and moist soil and plant *transpiration*. It is a coined word; probably the first recorded use is on page 296 of the Transactions of the American Geophysical Union, part 2, 1934.
Evapotranspiration, potential. *See* Potential evapotranspiration.
Excessive rainfall. *See* Rainfall, excessive.

Field capacity. *See* Field-moisturecapacity.
Field-moisture capacity. The quantity of water which can be permanently retained in the soil in opposition to the downward pull of gravity.
Field-moisture deficiency. The quantity of water, which would be required to restore the *soil moisture* to *field-moisture capacity*.
Flood. (1)An overflow or inundation that comes from a river or other body of water, and causes or threatens damage. (2)Any relatively high streamflow overtopping the natural or artificial banks in any reach of a stream. (3) A relatively high flow as measured by either gage height or discharge quantity. *See* Annual flood.

Flood-control storage. Storage of water in reservoirs to abate flood damage. *(See* Retarding reservoir.)
Flood crest. *See* Flood peak.
Flood event. *See* Flood wave.
Flood-frequency curve. (1) A graph showing the number of times per year on the average, plotted as abscissa, that floods of magnitude, indicated by the ordinate, are equaled or exceeded. (2(A similar graph but with *recurrence intervals* of floods plotted as abscissa.
Flood, maximum probable. The largest flood for which there is any reasonable expectancy in this climatic era.
Flood peak. The highest value of the stage or discharge attained by a flood; thus, peak stage or peak discharge. Flood crest has nearly the same meaning, but since it connotes the top of the *flood wave,* it is properly used only in referring to stage--thus, crest stage, but not crest discharge.
Flood plain. A strip of relatively smooth land bordering a stream, built of sediment carried by the stream and dropped in the slack water beyond the influence of the swiftest current. It is called a living flood plain if it is overflowed in times of high water; but a fossil flood plain if it is beyond the reach of the highest flood. (2) The lowland that borders a river, usually dry but subject to flooding. (3)That land outside of a stream channel described by the perimeter of the *maximum probable* flood.
Flood plane. The position occupied by the water surface of a stream during a particular flood. Also, loosely, the elevation of the water surface at various points along the stream during a particular flood.
Flood profile. A graph of elevation of the water surface of a river in flood, plotted as ordinate, against distance, measured in the downstream direction, plotted as abscissa. A flood profile may be drawn to show elevation at a given time, crests during a particular flood, or to show stages of *concordant flows.*
Flood routing. The process of determining progressively the timing and shape of a *flood wave* at successive points along a river.
Floods above a base. *See* Partial-duration flood series.
Flood stage. The gage height of the lowest bank of the reach in which the gage is situated. The term "lowest bank" is, however, not to be taken to mean an unusually low place or break in the natural bank through which the water inundates an unimportant and small area.
The stage at which overflow of the natural banks of a stream begins to cause damage in the reach in which the elevation is measured. *See also* Bankfull stage.
Flood wave. A distinct rise in stage culminating in a crest and followed by recession to lower stages.
Floodway. A part of the flood plain otherwise leveed, reserved for emergency diversion of water during floods. A part of the flood plain which, to facilitate the passage of floodwater, is kept clear of encumbrances.
The channel of a river or stream and those parts of the flood plains adjoining the channel, which are reasonably required to carry and discharge the floodwater or floodflow of any river or stream.
Flood zone. The land bordering a stream which is subject to floods of about equal frequency; for example, a strip of the *flood plain* subject to flooding more often that once but not as frequently as twice in a century.

Flow-duration curve. A cumulative frequency curve that shows the percentage of time that specified discharges are equaled or exceeded.
Forest influences. Effects resultingfrom the presence of forest or brush upon climate, soil water, runoff, streamflow, floods, erosion, and soil productivity.
Gage height. The water-surface elevation referred to some arbitrary gage datum. Gage height is often used interchangeably with the more general term *stage* although gage height is more appropriate when used with a reading on a gage.
Gaging station. A particular site on a stream, canal, lake, or reservoir where systematic observations of *gage height* or *discharge* are obtained. (*See also* Stream-gaging station.)
Glacier. Bodies of land ice that consist of recrystallized snow accumulated on the surface of the ground, and that move slowly downslope.
Ground water. Water in the ground that is in the *zone of saturation,* from which wells, springs, and *ground-water runoff*are supplied.
Ground-water outflow. That part of the discharge from a drainage basin that occurs through the ground water. The term "underflow" is often used to describe the ground-water outflow that takes place in valley alluvium (instead of the surface *channel)* and thus is not measured at a *gaging station*.
Ground-water runoff. That part of the runoff which has passed into the ground, has become ground water, and has been discharged into a stream channel as spring or seepage water. *See also* Base runoff *and* Direct runoff.
Guttation. The loss of water in liquid form from the uninjured leaf or stem of the plant, principally through water stomata.

Heat budget, annual (of a lake). The amount of heat necessary to raise the water from the minimum temperature of winter to the maximum temperature of summer.
Hydrograph. A graph showing stage, flow, velocity, or other property of water with respect to time.
Hydrologic budget. An accounting of the inflow to, outflow from, and storage in, a hydrologic unit, such as a drainage basin, aquifer, soil zone, lake, reservoir, or irrigation project.
Hydrologic cycle. A convenient term to denote the circulation of water from the sea, through the atmosphere, to the land; and thence, with many delays, back to the sea by overland and subterranean routes, and in part by way of the atmosphere; also the many short circuits of the water that is returned to the atmosphere without reaching the sea.
Hydrologic equation. The equation balancing the *hydrologic budget*.
Hydrology. (1)The science encompassing the behavior of water as it occurs in the atmosphere, on the surface of the ground, and underground. (2) The science that relates to the water of the earth. (3) The science treating of the waters of the earth, their occurrence, distribution, and movements. (4) In practice the study of the water of the oceans and the atmosphere is considered part of the sciences of oceanography and meteorology.
Hyetograph. Graphical representation of rainfall intensity against time.
Hypolimnion. *See* Thermal stratification.

Infiltration. The flow of a fluid into a substance through pores or small openings. It connotes flow into a substance in contradistinction to the word *percolation,* which connotes flow through a porous substance. *See also* Schiff and Dreibelbis and Musgrave

Infiltration capacity. The maximum rate at which the soil, when in a given condition, can absorb falling rain or melting snow.
Infiltration index. An average rate of infiltration, in inches per hour, equal to the average rate of rainfall such that the volume of rain fall at greater rates equals the total direct runoff.
Interception. The process and the amountof rain or snow stored on leaves and branches and eventually evaporated back to the air. Interception equals the precipitation on the vegetation minus *stem flow* and *throughfall.*
Irrigated area. The gross farm area upon which water is artificially applied for the production of crops, with no reduction for access roads, canals, or farm buildings.
Irrigation. The controlled application of water to arable lands to supply water requirements not satisfied by rainfall.
Irrigation Efficiency. The percentage of water applied that can be accounted for in soil-moisture increase.
Irrigation requirement. The quantity of water, exclusive of precipitation, that is required for crop production. It includes surface evaporation and other economically unavoidable wastes.
Irrigation, supplemental. *See* Supplemental irrigation.
Isohyet. *See* Isohyetal line.
Isohyetal line (isohyet). A line drawn on a map or chart joining points that receive the same amount of precipitation.

Limnology. That branch of hydrology pertaining to the study of lakes.
Long-period variations. Secular when a cycle or a change in trend is completed within a century; climatic when the period of change runs through centuries or a few millenia; geologic when the period runs into geological time. *See* Trend.
Low-flow frequency curve. A graph showing the magnitude and frequency of minimum flows for a period of given length. Frequency is usually expressed as the average interval, in years, between recurrences of an annual minimum flow equal to or less than that shown by the magnitude scale.
Lysimeter. Structure containing a mass of soil, and designed to permit the measurement of water draining through the soil.

M Mass curve. A graph of the cumulative values of a hydrologic quantity (such as precipitation or runoff), generally as ordinate, plotted against time or date as abscissa. *(See* Double-mass curve, *and* Residual-mass curve.)
Maximum probable flood. *See* Flood, maximum probable.
Meander. The winding of a stream channel.
Meander amplitude. Distance between points of maximum curvature of successive meanders of opposite phase in a direction normal to the general course of the meander belt, measured between centerlines of channels.
Meander belt. Area between lines drawn tangential to the extreme limits of fully developed meanders.
Meander breadth. The distance between the lines used to define the *meander belt.*
Meander length. Distance in the general course of the meanders between corresponding points of successive meanders of the same phase. Twice the distance between successive points of inflection of the meander wave.

Meromictic lake. A lake in which some water remains partly or wholly unmixed with the main water mass at circulation periods is said to be meromictic. The process leading to a meromictic state is termed meromixis The perennially stagnant deep layer of a meromictic lake is called the monimolimnion. The part of a meromictic lake in which free circulation can occur is called the mixolimnion. The boundary between the monimolimnion and the mixolimnion is called thechemocline.
Moisture. Water diffused in the atmosphere or the ground.
Moisture equivalent. The ratio of (a) the weight of water which the soil, after saturation, will retain against a centrifugal force 1,000 times the force of gravity, to (b) the weight of the soil when dry. The ratio is stated as a percentage.
Mudflow. A well-mixed mass of water and alluvium which, because of its high viscosity and low fluidity as compared with water, moves at a much slower rate, usually piling up and spreading over the fan like a sheet of wet mortar or concrete.

Normal. A central value (such as arithmetic average or median) of annual quantities for a 30-year period ending with an even 10-year, thus 1921-50; 1931-60, and so forth. This definition accords with that recommended by the Subcommittee on Hydrology of the Federal Inter-Agency Committee on Water Resources.

Overland flow. The flow of rainwater or snowmelt over the land surface toward stream channels. After it enters a stream, it becomes *runoff*.

Partial-duration flood series.A list of all flood peaks that exceed a chosen base stage or discharge, regardless of the number of peaks occurring in a year. (Also called *basic-stage flood series,* or *floods above a base*.)
Percolation. The movement, under hydrostatic pressure, of water through the interstices of a rock or soil, except the movement through large openings such as caves.
Percolation, deep. In irrigation or farming practice, the amount of water that passes below the root zone of the crop or vegetation.
Pondage. Small-scale storage at a waterpower plant to equalize daily or weekly fluctuations in river flow or to permit irregular hourly use of the water for power generation to accord with fluctuations in load.
Pool. A deep reach of a stream. The reach of a stream between two riffles. Natural streams often consist of a succession of pools and riffles.

Potential evapotranspiration. *Water loss* that will occur if at no time there is a deficiency of water in the soil for use of vegetation.
Potential natural water loss. The *water loss* during years when the annual precipitation greatly exceeds the average water loss. It represents the approximate upper limit to water loss under the type and density of vegetation native to a basin, actual conditions of moisture supply, and other basin characteristics, whereas *potential evapotranspiration* represents the hypothetical condition of no deficiency of water in the soil at any time for use of the type and density of vegetation that would develop.
Potential rate of evaporation. *See* **Evaporativity**.
Precipitation. As used in hydrology, precipitation is the discharge of water, in liquid or solid state, out of the atmosphere, generally upon a land or water surface. It is the common process

by which atmospheric water becomes surface or subsurface water * * *. The term "precipitation" is also commonly used to designate the quantity of water that is precipitated. Precipitation includes rainfall, snow, hail, and sleet, and is therefore a more general term than rainfall.
Rain. Liquid *precipitation*.
Rainfall. The quantity of water that falls as rain only. Not synonymous with *precipitation*.
Rainfall excess. The volume of rainfall available for direct runoff. It is equal to the total rainfall minus *interception*, *depression storage*, and *absorption*.
Rainfall, excessive. Rainfall in which the rate of fall is greater than certain adopted limits, chosen with regard to the normal precipitation (excluding snow) of a given place or area. In the U.S. Weather Bureau, it is defined, for States along the southern Atlantic coast and the Gulf coast, as rainfall in which the depth of precipitation is 0.90 inch at the end of 30 minutes and 1.50 inches at the end of an hour, and for the rest of the country as rainfall in which the depth of precipitation at the end of each of the same periods is 0.50 and 0.80 inch, respectively.
Reach. 1. The length of channel uniform with respect to discharge, depth, area, and slope. 2. The length of a channel for which a single gage affords a satisfactory measure of the stage and discharge. 3. The length of a river between two gaging stations. 4. More generally, any length of a river.
Recession curve. A hydrograph showing the decreasing rate of *runoff* following a period of rain or snowmelt. Since direct runoff and base runoff recede at different rates, separate curves, called direct runoff recession curves or base runoff recession curves, are generally drawn. The term "depletion curve" in the sense of base runoff recession is not recommended.
Recurrence interval (return period). The average interval of time within which the given flood will be equaled or exceeded once.
Regime. "Regime theory" is a theory of the forming of channels in material carried by the streams. As used in this sense, the word "regime" applies only to streams that make at least part of their boundaries from their transported load and part of their transported load from their boundaries, carrying out the process at different places and times in any one stream in a balanced or alternating manner that prevents unlimited growth or removal of boundaries. A stream, river, or canal of this type is called a "regime stream, river, or canal." A regime channel is said to be "in regime" when it has achieved average equilibrium; that is, the average values of the quantities that constitute regime do not show a definite trend over a considerable period--generally of the order of a decade. In unspecialized use "regime" and "regimen" are synonyms.
Regimen of a stream. The system or order characteristic of a stream; in other words, its habits with respect to velocity and volume, form of and changes in channel, capacity to transport sediment, and amount of material supplied for transportation. The term is also applied to a stream which has reached an equilibrium between corrosion and deposition or, in other words, to a graded stream.
Regulation. The artificial manipulation of the flow of a stream.
Re-regulating reservoirs. A reservoir for reducing diurnal fluctuations resulting from the operation of an upstream reservoir for power production.
Reservoir. A pond, lake, or basin, either natural or artificial, for the storage, regulation, and control of water.

Residual-mass curve. A graph of the cumulative departures from a given reference such as the arithmetic average, generally as ordinate, plotted against time or date, as abscissa. (*See* Mass curve.)
Retarding reservoir. Ungated reservoir for temporary storage of flood water. Sometimes called detention reservoir.
Return flow. That part of irrigation water that is not consumed by evapotranspiration and that returns to its source or another body of water. The term is also applied to the water that is discharged from industrial plants. Also called return water.
Riffle. A rapid in a stream.
Riparian. Pertaining to the banks of a stream.
Runoff. That part of the precipitation that appears in surface streams. It is the same as *streamflow* unaffected by *artificial diversions, storage*, or other works of man in or on the stream channels. Runoff may be classified as follows:
Classification as to speed of appearance after rainfall or snow melting:

- Direct runoff
- Base runoff
- Classification as to source:
- Surface runoff (*see* Overland flow)
- Storm seepage
- Ground-water runoff (*see* Stream, gaining)

Runout. *See* Water yield**.**

Sediment. Fragmental material that originates from weathering of rocks and is transported by, suspended in, or deposited by water or air or is accumulated in beds by other natural agencies.
Sediment discharge. The rate at which dry weight of sediment passes a section of a stream or is the quantity of sediment, as measured by dry weight, or by volume, that is discharged in a given time.
Seiche. The free oscillation of the bulk of water in a lake and the motion caused by it on the surface of the lake.
Shifting control. *See* Control**.**
Skimming. The diversion of water from a stream or conduit by a shallow overflow used to avoid diversion of sand, silt, or other debris carried as bottom load.
Snow. A form of precipitation composed of ice crystals.
Snow course. A line or series of connecting lines along which snow samples are taken at regularly spaced points.
Snow density. Ratio between the volume of melt water derived from a sample of snow and the initial volume of the sample. This is numerically equal to the specific gravity of the snow.
Snowline. The general altitude to which the continuous snow cover of high mountains retreats in summer, chiefly controlled by the depth of the winter snowfall and by the temperature of the summer.
Snowline, temporary. A line sometimes drawn on a weather map during the winter showing the southern limit of the snow cover.
Snow, quality of. The ratio of heat of melting of snow, in calories per gram to the 80 calories per gram for melting pure ice at 0 degrees C. Percentage by weight which is ice.

Soil moisture (Soil water) . Water diffused in the soil, the upper part of the *zone of aeration* from which water is discharged by the *transpiration* of plants or by soil evaporation. *See* Field-moisture capacity *and* Field-moisture deficiency.
Stage. The height of a water surface above an established datum plane; also *gage height*.
Stage-capacity curve. A graph showing the relation between the surface elevation of the water in a reservoir, usually plotted as ordinate, against the volume below that elevation, plotted as abscissa.
Stage-discharge curve (rating curve). A graph showing the relation between the gage height, usually plotted as ordinate, and the amount of water flowing in a channel, expressed as volume per unit of time, plotted as abscissa.
Stage-discharge relation. The relation expressed by the *stage-discharge curve*.
Stage, flood. *See* Flood stage.
Stemflow. Rainfall or snowmelt led to the ground down the trunks or stems of plants.
Storage. 1. Water artificially impounded in surface or underground reservoirs, for future use. The term *regulation* refers to the action of this storage in modifying *streamflow*. *See also* Conservation storage, Total storage, Dead storage, *and* Usable storage. 2. Water naturally detained in a drainage basin, such as *ground water, channel storage,* and *depression storage*. The term "drainage basin storage" or simply "basin storage" is sometimes used to refer collectively to the amount of water in natural storage in a drainage basin.
Storage, bank. *See* Bank storage.
Storage, conservation. *See* Conservation storage.
Storage, dead. *See* Dead storage.
Storage, depression. *See* Depression storage.
Storage ratio. The net available storage divided by the mean flow for 1 year.
Storage-required frequency curve. A graph showing the frequency with which storage equal to or greater than selected amounts will be required to maintain selected rates of regulated flow.
Storage, total. *See* Total storage.
Storage, usable. *See* Usable Storage.
Storm. A disturbance of the ordinary average conditions of the atmosphere which, unless specifically qualified, may include any or all meteorological disturbances, such as wind, rain, snow, hail, or thunder.
Stormflow. *See* Direct runoff.
Storm seepage. That part of precipitation which infiltrates the surface soil, and moves toward the streams as ephemeral, shallow, perched ground water above the main ground-water level. Storm seepage is usually part of the *direct runoff*.
Stream. A general term for a body of flowing water. In hydrology the term is generally applied to the water flowing in a natural *channel* as distinct from a canal. More generally as in the term *stream gaging,* it is applied to the water flowing in any channel, natural or artificial. Streams in natural channels may be classified as follows:
Relation to time.

- **Perennial.** One which flows continuously.
- **Intermittent or seasonal**. One which flows only at certain times of the year when it receives water from springs or from some surface source such as melting snow in mountainous areas.

- **Ephemeral.** One that flows only in direct response to precipitation, and whose channel is at all times above the water table.

Relation to space.

- **Continuous**. One that does not have interruptions in space.
- **Interrupted**. One which contains alternating reaches, that are either perennial, intermittent, or ephemeral.

Relation to ground water.

- **Gaining**. A stream or reach of a stream that receives water from the *zone of saturation*.
- **Losing.** A stream or reach of a stream that contributes water to the *zone of saturation*.
- **Insulated**. A stream or reach of a stream that neither contributes water to the *zone of saturation* nor receives water from it. It is separated from the zones of saturation by an impermeable bed.
- **Perched**. A perched stream is either a losing stream or an insulated stream that is separated from the underlying ground water by a *zone of aeration*.

Streamflow. The discharge that occurs in a natural *channel*. Although the term *discharge* can be applied to the flow of a canal, the word streamflow uniquely describes the discharge in a surface stream course. The term "streamflow" is more general than *runoff*, as streamflow may be applied to discharge whether or not it is affected by *diversion* or *regulation*.
Streamflow depletion. The amount of water that flows into a valley, or onto a particular land area, minus the water that flows out the valley or off from the particular land area.
Stream gaging. The process and art of measuring the depths, areas, velocities, and rates of flow in natural or artificial channels.
Stream-gaging station. A *gaging station* where a record of discharge of a stream is obtained. Within the Geological Survey this term is used only for those gaging stations where a continuous record of discharge is obtained.
Stream order. A method of numbering streams as part of a drainage basin network. The smallest unbranched mapped tributary is called first order, the stream receiving the tributary is called second order, and so on. It is usually necessary to specify the scale of the map used. A first-order stream on a 1:62,500 map, may be a third-order stream on a 1:12,000 map. Tributaries which have no branches are designated as of the first order, streams which receive only first-order tributaries are of the second order, larger branches which receive only first-order and second-order tributaries are designated third order, and so on, the main stream being always of the highest order.
Submeander. Small meander contained with banks of main channel, associated with relatively low discharges.
Subsurface runoff. *See* Storm seepage.
Supplemental irrigation. Commonly, irrigation as carried on in humid areas. The term means that the irrigation water is supplementary to the natural rainfall rather than being the primary source of moisture as in the arid and semiarid West. Supplementary irrigation is used generally to prevent retardation of growth during periods of drought.
Supplemental sources. When irrigation water supplies are obtained from more than one source, the source furnishing the principal supply is commonly designated the primary source, and the sources furnishing the additional supplies, the supplemental sources.
Surface runoff. That part of the runoff which travels over the soil surface to the nearest stream channel. It is also defined as that part of the runoff of a drainage basin that has not passed beneath the surface since precipitation. The term is misused when applied in the sense

of direct runoff. *See also,* Runoff, Overland flow, Direct runoff, Ground-water runoff, *and* Surface water.
Surface water. Water on the surface of the earth.

Tank. An artificial reservoir for stock water; local in Southwest.
Terrace. A berm or discontinuous segments of a berm, in a valley at some height above the *flood plain,* representing a former abandoned flood plain of the stream.
Thermal stratification (of a lake) . Vertical temperature stratification that shows the following: The upper layer of the lake, known as the epilimnion, in which the water temperature is virtually uniform; a stratum next below, known as the thermocline, in which there is a marked drop in temperature per unit of depth; and the lowermost region or stratum, known as the hypolimnion, in which the temperature from its upper limit to the bottom is nearly uniform.
Thermocline. *See* Thermal stratification.
Throughfall. In a vegetated area, the precipitation that falls directly to the ground or the rainwater or snowmelt that drops from twigs or leaves. (*See* Stemflow.)
Time of concentration. The time required for water to flow from the farthest point on the watershed to the gaging station.
Total storage. The volume of a reservoir below the maximum controllable level including dead storage.
Transpiration. The quantity of water absorbed and transpired and used directly in the building of plant tissue, in a specified time. It does not include soil evaporation. The process by which water vapor escapes from the living plant, principally the leaves, and enters the atmosphere. * * * As considered practically, transpiration also includes *guttation*.
Trend. A statistical term referring to the direction or rate of increase or decrease in magnitude of the individual members of a time series of data when random fluctuations of individual members are disregarded.

Underflow. The downstream flow of water through the permeable deposits that underlie a stream and that are more or less limited by rocks of low permeability.
Unit hydrograph. (1) The *hydrograph* of *direct runoff* from a storm uniformly distributed over the *drainage basin* during a specified unit of time; the hydrograph is reduced in vertical scale to correspond to a volume of runoff of 1 inch from the drainage basin. (2) The hydrograph of surface runoff (not including ground-water runoff) on a given basin due to an *effective rainfall* falling for a unit of time.
Usable storage. The volume normally available for release from a reservoir below the stage of the maximum controllable level.

Water balance. *See* Hydrologic budget**.**
Water content of snow. *See* Water equivalent of snow.
Water crop. *See* Water yield.
Water equivalent of snow. Amount of water that would be obtained if the snow should be completely melted. Water content may be merely the amount of liquid water in the snow at the time of observation.
Water loss. The difference between the average precipitation over a drainage basin and the *water yield* from the basin for a given period. The basic concept is that water loss is equal to

evapotranspiration, that is, water that returns to the atmosphere and thus is no longer available for use. However, the term is also applied to differences between measured inflow and outflow even where part of the difference may be seepage.
Water requirement. The quantity of water, regardless of its source, required by a crop in a given period of time, for its normal growth under field conditions. It includes surface evaporation and other economically unavoidable wastes.
Watershed. The divide separating one *drainage basin* from another and in the past has been generally used to convey this meaning. However, over the years, use of the term to signify drainage basin or catchment area has come to predominate, although drainage basin is preferred. *Drainage divide,* or just divide, is used to denote the boundary between one drainage area and another. Used alone, the term "watershed" is ambiguous and should not be used unless the intended meaning is made clear.
Water table. The upper surface of a zone of saturation. No water table exists where that surface is formed by an impermeable body.
Water year. In Geological Survey reports dealing with surface-water supply, the 12-month period, October 1 through September 30. The water year is designated by the calendar year in which it ends and which includes 9 of the 12 months. Thus, the year ended September 30, 1959, is called the "1959 water year."
Water yield (water crop or runout). The runoff from the drainage basin, including *ground-water outflow* that appears in the stream plus ground-water outflow that bypasses the gaging station and leaves the basin underground. Water yield is the *precipitation* minus the *evpotranspiration*.
Withdrawal use of water. The water removed from the ground or diverted from a stream or lake for use.

Year. *See* Climatic year; Water year.

Zone of aeration. The zone above the water table. Water in the zone of aeration does not flow into a well.
Zone of saturation. The zone in which the functional permeable rocks are saturated with water under hydrostatic pressure. Water in the zone of saturation will flow into a well, and is called *ground water*.

Lower Coosa River
Basin Management Plan

May 2005

Alabama
Clean
Water
Partnership

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Table of Contents

List of Figures

Introduction

The goal of the Lower Coosa River Basin Management Plan is to produce *a locally endorsed and supported plan that can be cooperatively implemented through private incentives and by local state government programs to maintain the beneficial uses of water throughout the Lower Coosa River Basin.* The purpose of the plan is to address nonpoint source pollution through the identification of watershed management issues and education of the residents, governments, businesses and industries in the Lower Coosa River Basin of the cumulative impact of their individual actions.

Nonpoint Source Pollution

Pollution is basically the discharge of nutrients, pathogens, toxics or causing thermal changes that vary from the natural background parameters of the receiving stream. Prior to the implementation of the National Pollution Discharge Elimination System (NPDES), there were direct discharges of pollution into surface waters and on the ground that far exceeded the natural parameters of the waterway. The discharges relied on the mere volume of water to dilute the discharge. In addition, discharges were typically downstream of locations where drinking water was extracted so the specific water user was not contaminating their own water supply. There was no regard for the proximity of downstream water withdrawers. Under the NPDES program, point sources of pollution are required to meet certain permit standards, but the discharge may still be at variance with the natural parameters of the stream. The discharge allowed may still depend on the natural cleansing process of the waterway. This is why the old adage, "*dilution is the solution to pollution*" became prominent.

Nonpoint sources of pollution are diverse in character and so distributed throughout the watershed that a change in thinking must be implemented to solve the problem. The best approach to controlling nonpoint pollution is to deal with it at the source and prevent the contaminants from entering the water network. This applies to the pollution of either ground or surface water supplies. Pollution prevention must address both resources because they are integrally connected and are often interchanged by natural processes within the water network.

When pollution occurs in a surface water resource there is a natural cleansing process that occurs within a natural stream. For this reason the process takes a certain distance of stream flow in conjunction with the volume of water to overcome lower levels of pollution. When the same pollution is introduced into groundwater resources there is a much slower travel time and infinitely smaller flows of water. The natural cleansing process takes a significantly extended period. In addition, the artificial clean-up of groundwater pollution is significantly more expensive. Therefore, avoiding pollution of groundwater resources is equally important within the watershed area. Priority is given to eliminating or controlling sources of pollution at the point of origination. Secondary to controlling the source of pollution is the implementation of actions and projects designed to prevent or reduce the transport of pollution contaminants from the point of origin to the water network. As a last resort, measures can be implemented to directly address streams and channels because the pollution contaminants have already entered the water network.

This priority for preventative action is also related to relative cost and the potential transfer of costs. When pollution is addressed at the point of origin the cost of containing the contaminant causing the pollution is usually nominal or the least costly. For example, many actions taken by individual householders incur no cost, but merely represent changes in day-to-day practices that the individual may not have even been aware was causing a pollution problem. When there is a nominal cost involved to control the point of origination the burden of the cost is then borne by the entity responsible for the pollution.

When pollution is transported away from the point of origin, the cost of treatment typically increases because treatment must occur on someone else's property. The acquisition of property rights or ownership is incurred on top of the cost of treatment. The cost of treatment is also likely to be increased because the contaminant has been dispersed over a larger area. Due to the dispersal it is likely that larger volumes of material will have to be treated. That also increases the cost of treatment.

When pollution contaminants reach the water network the cost is increased again. When contamination is introduced in the water network, all the water must be treated when it is withdrawn for consumption or use. In addition, increased water treatment is required before discharges can be made to the water network. These increased costs are usually transferred to users in the form of higher fees. In rare instances when the level of pollution in the waterway is severe, the ability to allow any new discharges may be terminated until other discharges can farther reduce the contaminants. In essence, a development moratorium is self-imposed because local water pollution has not been controlled.

The Planning Process

The planning process for the Lower Coosa River Basin Management Plan began with an inventory and understanding of the existing characteristics of the basin and its watershed components. This was achieved through research and documentation of the existing physical, structural, cultural and demographic features of the Lower Coosa River Basin, which are presented in Part I of this plan. Part II of the plan provides information about the existing water quality of the Lower Coosa River Basin as available from water quality monitoring results and basin assessments. Part III proposes a management strategy to accomplish the goals and objectives of the plan. The management measures presented in Chapter 14 are intended to address nonpoint source issues as well as water quality issues so that the framework of the watershed approach is upheld.

During the planning process, two phases of public education and awareness were conducted in which information was presented to residents of the basin in public meetings. As a part of these public education and awareness meetings, residents were asked to complete surveys, identify local issues, and identify and comment on local water quality management efforts.

The first phase of the education and awareness component of the project was to address elected officials and residents at local government meetings. A short presentation was made at a meeting of each of the 22 local governments located within the Lower Coosa River Basin, and the same presentation also being made at regular meetings of each of the three homeowner and boat owner associations (HOBOs) that are located within the basin. The purpose of these meetings was to educate citizens and local decision-makers regarding development of the plan, make them aware of the issues in water quality protection and in watershed management, provide them with an encapsulated view of the existing conditions within the basin, receive comments and suggestions for water quality protection alternatives, andto encourage participation in the stakeholder process of the Coosa River Clean Water Partnership. In this process, a combined total of approximately 450 stakeholders were addressed in the meetings and provided with a four-page brochure about the Lower Coosa River Basin Management Plan project.

With the brochure, residents were asked to complete a survey identifying water quality issues and/or concerns of both the basin and their local watershed. Response rate to the surveys that were distributed was just under 10 percent, with 43 surveys returned. Responses to the survey indicated that approximately one-third of those in attendance at the meetings knew about the development of the Lower Coosa River Basin Management Plan and understood what nonpoint source pollution is. Responses show that residents thought that most common types of nonpoint source pollution present in the Lower Coosa River Basin are urban runoff, agricultural runoff, failing onsite septic systems, illegal dumping and sedimentation. Residents stated that the most harmful types of nonpoint source pollution are urban runoff and failing septic systems, followed distantly by illegal dumping, sedimentation and silviculture runoff. Locally identified water quality issues in the survey included pollutants, urban growth, high nutrient loads, point source discharges, and stream flow (quantity of water).

In the second phase of the education and awareness component of the Lower Coosa River Basin Management Plan planning process, a series of five public meetings were held in Shelby, Talladega, Chilton, Coosa and Elmore Counties in May and June, 2004. Residents were notified of the meetings by a flyer that was mailed to approximately 2000 residents and through notification in local newspapers. The purpose of the second phase of education and awareness meetings was to review the findings presented in Parts I and II of the plan, present the issues that had been identified, and to receive citizen comments on ways to address nonpoint source pollution, thereby managing the water quality of the Lower Coosa River and its contributing streams.

Following the two series of public meetings, a draft of the Lower Coosa River Basin Management Plan, an executive summary, and an atlas of the watersheds of the basin was prepared and posted on the website of Alabama Clean Water Partnership for public comments. Citizens were notified of the posting through an email list that was compiled from the attendance rosters at the series of public meetings and through presentation to stakeholders at the Coosa River Basin Clean Water Partnership Steering Committee Meeting and the Lower Coosa River Basin Clean Water Partnership Meeting. Following citizen comments, final modifications were made to the plan and it was produced in a final form in June 2005.

Final production of the plan, however, is only the beginning of the plan review and amendment process. It is intended that the Lower Coosa River Basin Management Plan will be reviewed by the Lower Coosa River Clean Water Partnership and the Coosa River Basin Clean Water Partnership Steering Committee annually and major review and revisions should occur at least every five years. The format of the plan lends itself to easy updates and amendments so that the plan can remain current and usable. Additionally, the format of the watershed management protection measures is meant to be actively utilized by stakeholders by maintaining a status log of watershed management activities and “checking off” the actions that have been completed.

Key Elements

To ensure that Section 319 projects make progress towards restoring waters impaired by nonpoint source pollution, watershed protection plans that are developed or implemented with Section 319 funds to address Section 303(d)-listed waters must include at least the nine elements listed in the table on the following page. The Lower Coosa River Basin Management Plan has addressed these key issues to the extent possible at the basinwide level. Additional watershed plans will be needed to identify specific local projects and estimate funding and technical assistance needs, however, the Atlas of Watersheds (Section 3) provides much of the background information that will be needed to complete the development of the local watershed plans and implementation strategies. The location of where information may be found within the Lower Coosa River Basin Management Plan is shown in the right column of the table below, along with recommendations for future studies to fully address the key elements, as outlined by the U.S. Environmental Protection Agency.

The Nine Elements of a Watershed Protection Plan	
Key Element	Work Element Where EPA Key Element Is Addressed
1. An identification of the causes and sources or groups of similar sources that will need to be controlled to achieve the load reductions estimated in this watershed-based plan (and to achieve any other watershed goals identified in the watershed-based plan), as discussed in item (b) immediately below. Sources that need to be controlled should be identified at the significant subcategory level with estimates of the extent to which they are present in the watershed (e.g., X numbers of dairy cattle feedlots needing upgrading, including a rough estimate of the number of cattle per facility; Y acres of row crops needing improved nutrient management or sediment control; or Z linear miles of eroded streambank needing remediation).	Part I: Basin Characteristics Part II: Water Quality Part III, Chapter 12: Priority Watersheds Atlas of Watershed
2. An estimate of the load reductions expected for the management measures described under paragraph (c) below (recognizing the natural variability and the difficulty in precisely predicting the performance of management measures over time). Estimates should be provided at the same level as in item (a) above (e.g., the total load reduction expected for dairy cattle feedlots; row crops; or eroded streambanks).	Subwatershed management plans will need to be completed to fully address this element, however, issues identified in the Atlas of Watersheds provide a starting point for this process.
3. A description of the NPS management measures that will need to be implemented to achieve the load reductions estimated under paragraph (b) above (as well as to achieve other watershed goals identified in this watershed-based plan), and an identification (using a map or a description) of the critical areas in which those measures will be needed to implement this plan.	Part III, Chapter14: Water Quality Improvement Program
4. An estimate of the amounts of technical and financial assistance needed, associated costs, and/or the sources and authorities that will be relied upon, to implement this plan. As sources of funding, States should consider the use of their Section 319 programs, State Revolving Funds, USDA's Environmental Quality Incentives Program and Conservation Reserve Program, and other relevant Federal, State, local and private funds that may be available to assist in implementing this plan.	Subwatershed management plans will need to be completed to fully address this element, however, issues identified in the Atlas of Watersheds provide a starting point for this process. Additionally, watershed management resources have been identified and are included in Appendix E.

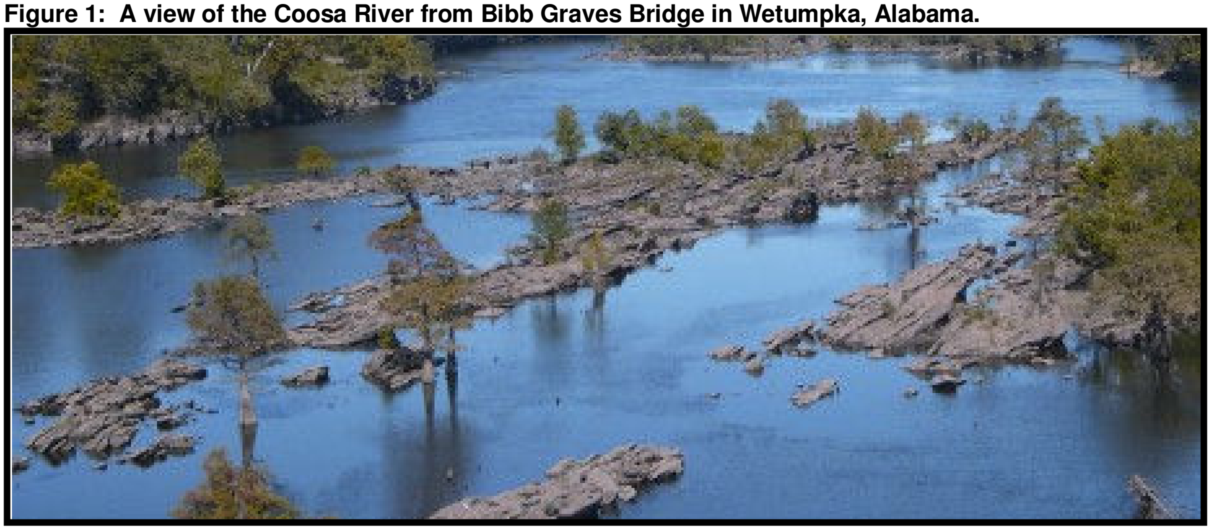
5. An information/education component that will be used to enhance public understanding of the project and encourage their early and continued participation in selecting, designing, and implementing the NPS management measures that will be implemented.	Part III, Chapter 13: Watershed Management Framework, the Executive Summary, and the planning process that was utilized in the development of the Lower Coosa River Basin Management Plan
6. A schedule for implementing the NPS management measures identified in this plan that is reasonably expeditious.	Part III, Chapter14: Water Quality Improvement Program
7. A description of interim, measurable milestones for determining whether NPS management measures or other control actions are being implemented.	Part III, Chapter14: Water Quality Improvement Program
8. A set of criteria that can be used to determine whether loading reductions are being achieved over time and substantial progress is being made towards attaining water quality standards and, if not, the criteria for determining whether this watershed-based plan needs to be revised or, if a NPS TMDL has been established, whether the NPS TMDL needs to be revised.	Subwatershed management plans will need to be completed to fully address this element, however, issues identified in the Atlas of Watersheds provide a starting point for this process.
9. A monitoring component to evaluate the effectiveness of the implementation efforts over time, measured against the criteria established under item (h) immediately above.	Subwatershed management plans will need to be completed to fully address this element, however, issues identified in the Atlas of Watersheds provide a starting point for this process.

Part I
Basin Characteristics

Chapter 1
Location and Setting

The Lower Coosa River Basin is the southernmost watershed of the Coosa River Basin, which begins in Rome, Georgia. The Coosa River is formed at the confluence of the Oostanaula and Etowah Rivers at Rome and flows in a westerly direction for approximately 30 miles through Georgia and enters Alabama about ten miles northeast of Cedar Bluff in Cherokee County. After entering Alabama, the Coosa River flows in a southwesterly direction until it reaches the vicinity of Lay Lake in Coosa County, where it begins to flow to the southeast. The Coosa River wanders through approximately 250 miles within Alabama before joining the Tallapoosa River about ten miles north of Montgomery in Elmore County to form the Alabama River.[1]

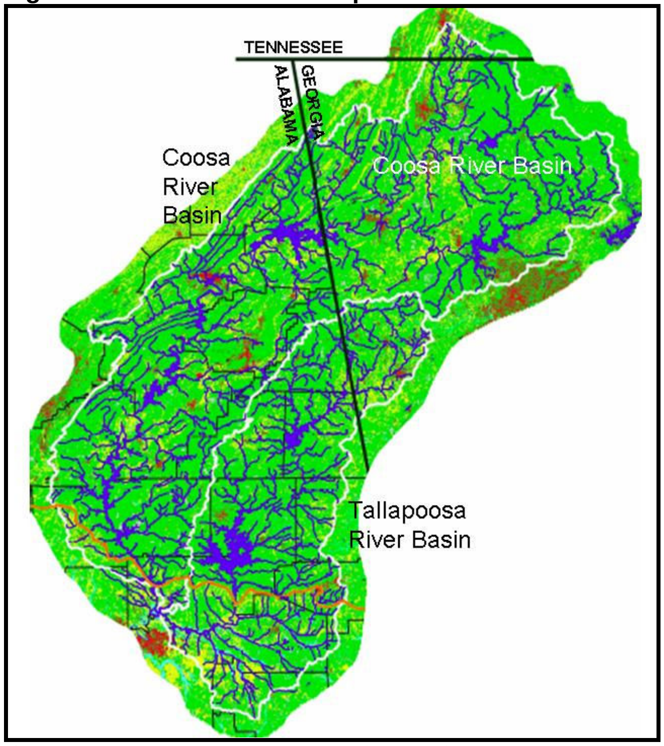
Figure 1: A view of the Coosa River from Bibb Graves Bridge in Wetumpka, Alabama.



Source: Alabama Clean Water Partnership

A total of 10,266 square miles drain to the Coosa River, of which 5,407 square miles are within the State of Alabama. The Coosa River drains portions of 13 Alabama counties, with Talladega County contributing the most land area, at 480,000 acres, and Autauga County contributing the least land area, at 8,255 acres.[1] Using hydrologic unit codes (HUC) (as established by the U.S. Geological Survey and explained in the *Watersheds* section that follows) the Coosa River Basin is subdivided into three smaller basins: the Upper Coosa River Basin (HUC 03150105), the Middle Coosa River Basin (HUC 03150106) and the Lower Coosa River Basin (HUC 03150107). The Upper Coosa River Basin encompasses 1,610 square miles in Alabama, Georgia and Tennessee; the Middle Coosa River Basin encompasses 2,580 square miles in Alabama; and, the Lower Coosa River Basin is 1,910 square miles in size, also located entirely in Alabama.[2]

Figure 2: The Coosa and Tallapoosa River Basins



Source: Alabama Water Watch, Citizen Guide to Alabama Rivers: Alabama, Coosa and Tallapoosa, 2002

As defined for purposes of this study, the Lower Coosa River Basin begins just north of Childersburg at the confluence of the Tallaseehatchee Creek with the Coosa River and stretches to the confluence of the Coosa and Tallapoosa Rivers just south of Wetumpka. It drains portions of seven counties and all or portions of 14 municipalities. Counties located within the Lower Coosa River Basin include Autauga, Chilton, Clay, Coosa, Elmore, Shelby and Talladega. The area of each county that is located within the basin is shown in Figure 3, along with the municipalities of each county that are partially are entirely located with the basin boundaries. Coosa County contributes the most land area to the Lower Coosa River Basin, at 375,792 acres, which is 88.12 percent of the total area of the county. Just over half of Shelby County, 50.39 percent, and just under half of Chilton County, 46.52 percent, are located within the basin. Autauga County contributes the least land area, at 8,255 acres, which is only 2.13 percent of the total area of the county.

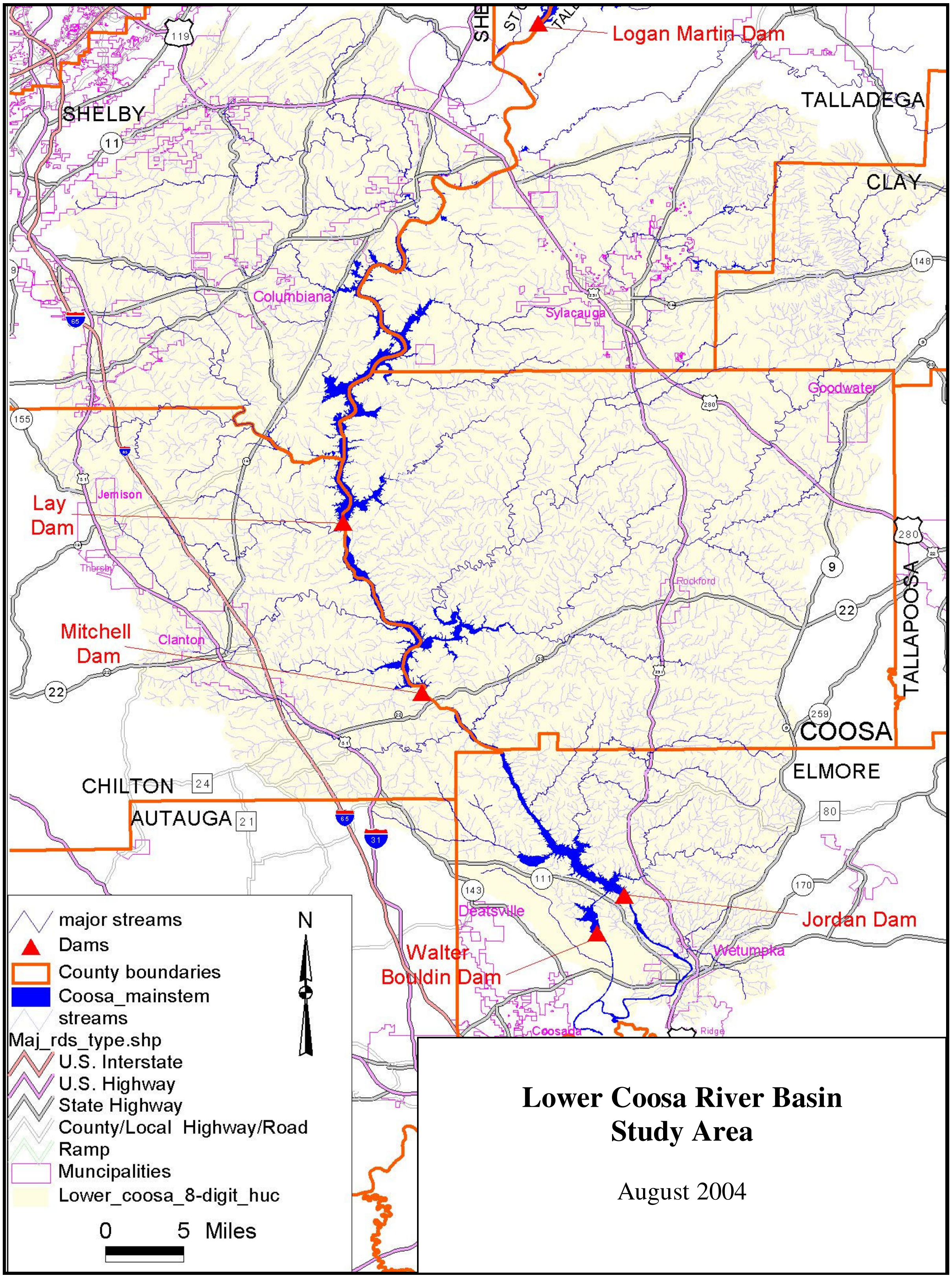
Figure 3:

Area By County Located Within The Lower Coosa River Basin

County	Acres of Land Within Basin	% of County Within Basin	% of Total Basin Area	Municipalities
Autauga	8,255	2.13%	0.66%	
Chilton	208,633	46.52%	16.75%	Clanton, Jemison, Thorsby
Clay	75,600	19.49%	6.06%	
Coosa	375,792	88.12%	30.18%	Goodwater, Rockford
Elmore	135,313	32.17%	10.86%	Wetumpka
Shelby	261,093	50.39%	20.97%	Calera, Chelsea, Columbiana, Harpersville, Pelham, Wilsonville
Talladega	180,909	37.18%	14.52%	Childersburg, Sylacauga

Source: Alabama Soil and Water Conservation Committee. Alabama Watershed Assessment. August 2004. http://www.swcc.state.al.us/watershedmenu.htm

Figure 4:



Source: Alabama Department of Environmental Management. August 2004.

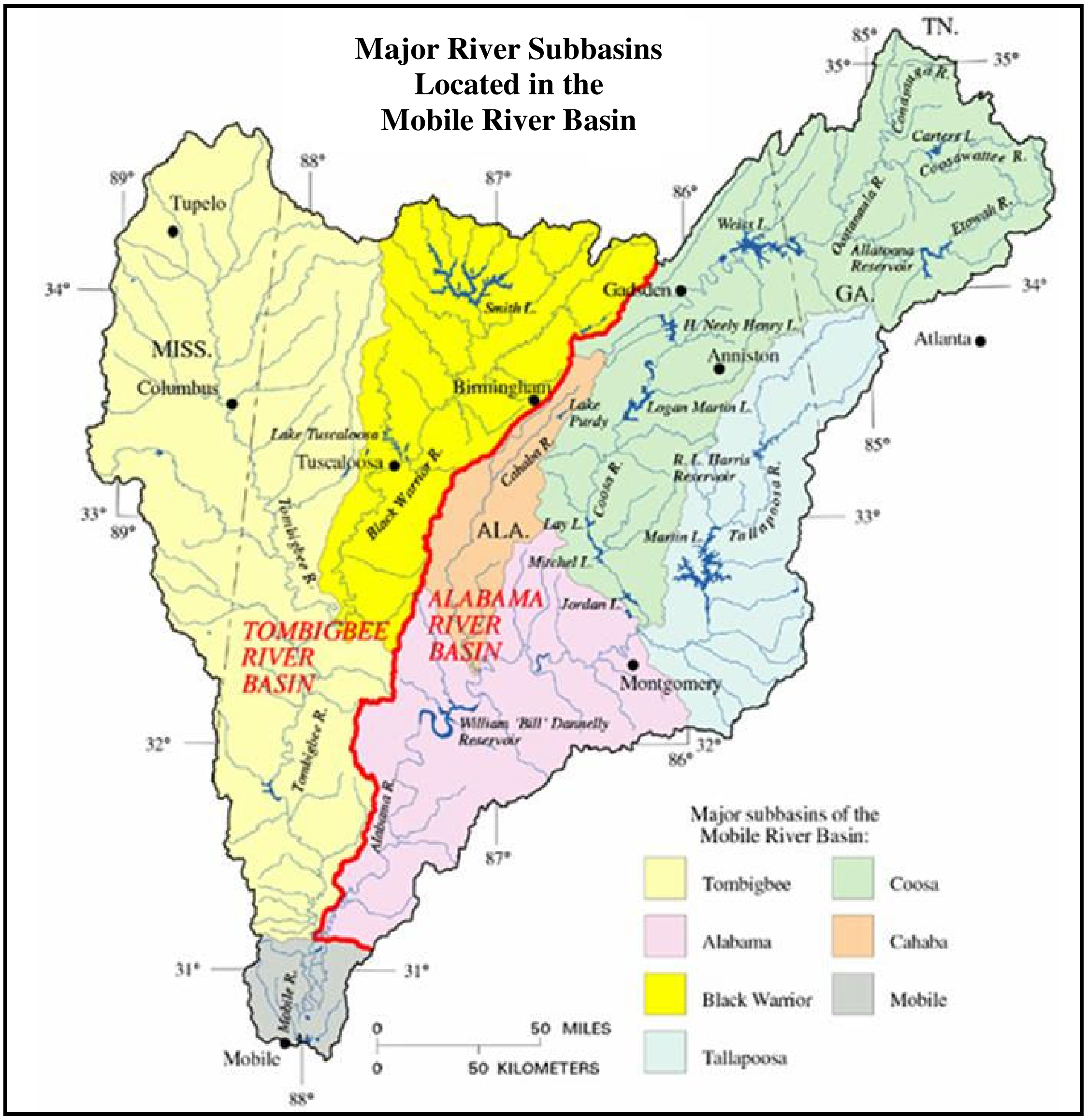
Of the 14 municipalities located within the Lower Coosa Basin , most are found in the northern part of the basin with six municipalities in Shelby County, two in Talladega County and one in the north part of Coosa County. The southern portion is considerably less urbanized with only five municipalities. The smallest town in the basin is Rockford, with a population of 428 as of 2000, while the largest city located entirely in the basin area is Sylacauga, with a 2000 population of 12,616. The City of Pelham, with a population of 14,369, is larger than Sylacauga, however, only the eastern portion of Pelham is located within the Lower Coosa River Basin. Outside of the incorporated areas, the Lower Coosa River Basin is generally characterized by rural lands, the majority of which is used as forest land.

The mean elevation of the Coosa River within this basin is 595.1 feet above sea level, with land elevations ranging from 131.2 feet to 1,878.3 feet above sea level. There are 1,612.5 miles of perennial streams and 1,002.9 miles of intermittent streams within the basin. As of January 2003, there were 4,812 miles of roads, 179.2 miles of railroad and 338.3 miles of pipes and power lines located within the basin boundaries.[3] The transportation system within the Lower Coosa Basin is limited, with only four locations to cross the Coosa River: one in Wetumpka, two near Clanton and one in Childersburg. Interstate-65, which is the only interstate in the basin area, runs along the western border of the basin. U.S. Highways include U.S. Highway 280, which runs southeast-northwest in the northern part of the basin; U.S. Highway 231, which runs north-south through the eastern portion; and a small part of U.S. Highway 31, which is located along the southwestern basin boundary. A significant system of state highways is present which includes Alabama Highways 9, 21, 22, 25, 70, 76, 145, and 148. The state highway system primarily provides access to the larger incorporated cities and towns. The central portion of the Lower Coosa Basin surrounding the Coosa River, particularly in Coosa County, is only accessible by county roads, many of which are unpaved.

Mobile River Basin

The Coosa River basin is one of ten river systems in Alabama that drains to the Mobile River and then into the Gulf of Mexico. The Mobile River Basin is one of the most biologically diverse ecosystems in the nation. The significance of the Lower Coosa River Basin's location within the Mobile River Basin is the Lower Coosa River's role in contributing to, and the protection of, this spectacular ecosystem. According to the *Recovery Plan for Mobile River Basin Aquatic Ecosystem*, "the [Mobile] Basin's endemic (native to a region and found nowhere else) fauna includes 40 fishes, 33 mussels, 110 aquatic snails, as well as turtles, aquatic insects, and crustaceans. The fauna and their habitats have been extensively affected over the years by impoundment, channelization, mining, dredging, and pollution from point (specific) and nonpoint (diffuse) sources. As a result, at least 17 mussels and 37 aquatic snails are presumed extinct, most within the past few decades."[4] Of the endemic species identified, the confines of the Lower Coosa River Basin provides habitat to five species covered under the Mobile Basin Recovery Plan and one specie covered under another recovery plan. Endangered species in the Lower Coosa River Basin are discussed in detail in Chapter 4.

Figure 5:



Source: U.S. Geological Survey, Alabama Office of Water Resources

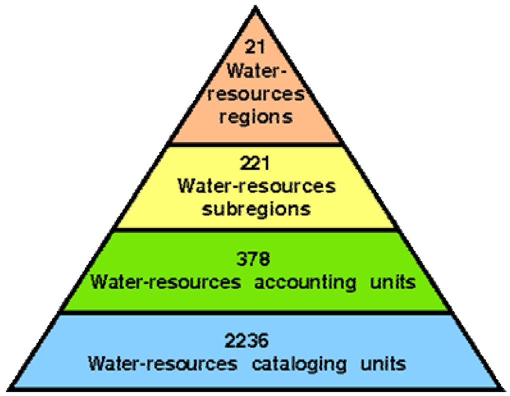
Watersheds

A watershed is the surrounding land area that drains into water body. The size of a watershed can vary depending on the size of the portion of a water body that is being referenced. The U.S. Geological Survey has developed a system of consistent delineation and identification of watersheds throughout the nation which is explained as follows. The United States is divided and subdivided into successively smaller water-resource regions (areas). The regions are arranged within each other, starting from the smallest (water-resources cataloging units) to the largest (water-resources regions). All areas have unique two-digit numbers to identify them. The numbers are progressively appended to specify the more detailed areas. In the United States, there are 21 water resource regions (2 digits), 221 subregions (4 digits), 378 accounting units (6 digits) and 2,236 cataloging units (8 digits).

The 8-digit cataloging unit for the Lower Coosa River is 03-15-01-07, which is also referred to as the hydrologic unit code, or HUC. The cataloging unit is a geographic area representing part or all of a surface drainage basin, a combination of drainage basins, or a distinct hydrologic feature.[5]

Figure 6:

Hierarchy of Water Resource Regions – The Hydrologic Unit Code



USGS Unit	Number Code	Coosa River System Description
Region	**03**	South Atlantic-Gulf Region
Subregion	03**15**	Alabama River Basin
Accounting Unit	0315**01**	Coosa-Tallapoosa Basin
Cataloging Unit	031501**07**	Lower Coosa River Basin
State Subunits - Watersheds	03150107**010**	Tallaseehatchee Creek

Source: USGS. Hydrologic Unit Maps. August 2004. http://water.usgs.gov/GIS/huc_name.txt.

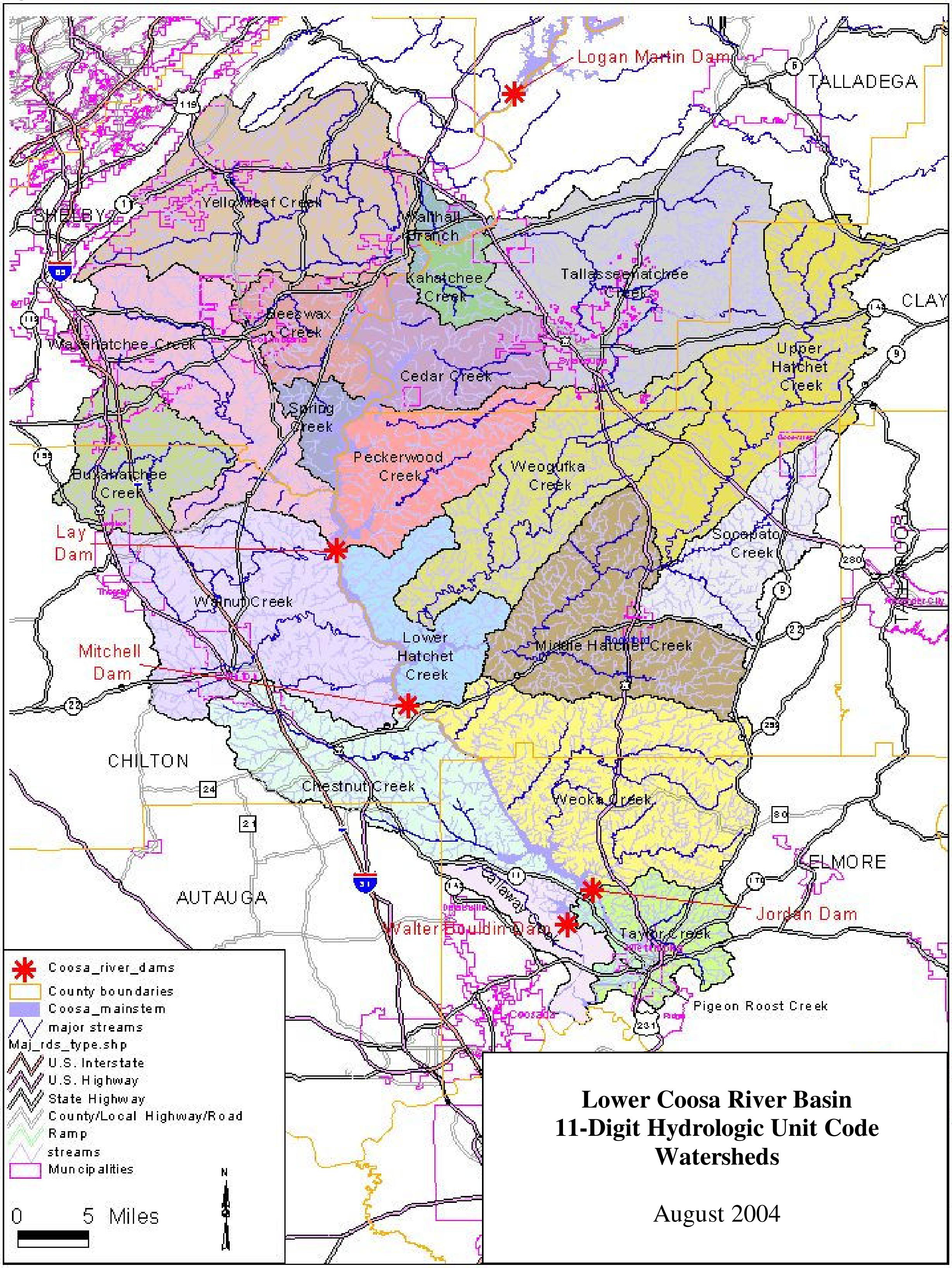
In Alabama, each of the 8-digit HUCs has been appended with an additional 3-digit number to designate smaller watersheds within the cataloging units resulting in an 11-digit HUC to designate the smaller drainage areas around major streams found in the cataloging unit. Alabama's 11-digit HUC map was last updated by USGS in July 1984 and used by the Natural Resource and Conservation Service's (NRCS) Soil and Water Conservation Committee (SWCC) to prepare a report titled *State of Alabama Hydrologic Unit Map With Drainage Area By Counties and Subwatersheds* in January 1995. The 11-digit HUC system is currently undergoing revision to a 12-digit HUC system to designate even smaller watersheds. The 12-digit HUC, however, is not expected to be utilized until early 2005. Therefore, all HUC references in this plan are made on the 8-digit or 11-digit HUC system.

Using the 11-digit HUC, there are 20 watersheds found in the Lower Coosa River Basin. Figure 7 lists the watersheds by number and name and provides the area of each. The location of each watershed is shown on Figure 8. For detailed information on each of the watersheds refer to the *Atlas of Lower Coosa Watersheds*. Walthall Branch is the smallest watershed, at 8,611 acres, comprising only 0.7 percent of the total basin area. The largest watershed is Tallaseehatchee Creek which is 128,147 acres in size and encompasses 10.29 percent of the Lower Coosa River Basin.

Figure 7:

Watersheds of the Lower Coosa River Basin			
11-Digit HUC	**Watershed Name**	**Area in Acres**	**% of Basin**
03150107010	Tallaseehatchee Creek	128,147	10.29%
03150107020	Walthall Branch	8,611	.69%
03150107030	Yellowleaf Creek	118,484	9.51%
03150107040	Kahatchee Creek	15,836	1.27%
03150107050	Beeswax Creek	36,371	2.92%
03150107060	Cedar Creek	41,594	3.34%
03150107070	Peckerwood Creek	53,130	4.27%
03150107080	Spring Creek	14,511	1.16%
03150107090	Buxahatchee Creek	44,551	3.58%
03150107100	Waxahatchee Creek	87,372	7.01%
03150107110	Upper Hatchet Creek	96,450	7.74%
03150107120	Socapatoy Creek	48,708	3.91%
03150107130	Middle Hatchet Creek	84,188	6.76%
03150107140	Weogufka Creek	78,757	6.32%
03150107150	Lower Hatchet Creek	38,844	3.12%
03150107160	Walnut Creek	112,675	9.05%
03150107170	Chestnut Creek	80,961	6.50%
03150107180	Weoka Creek	121,204	9.73%
03150107190	Pigeon Roost Creek	11,288	.91%
03150107200	Taylor Creek	28,913	2.32%
Source: Alabama Soil and Water Conservation Committee. Alabama Watershed Assessment. August 2004. http://www.swcc.state.al.us/watershedmenu.htm			

Figure 8:



Source: Alabama Department of Environmental Management. August 2004.

Climate

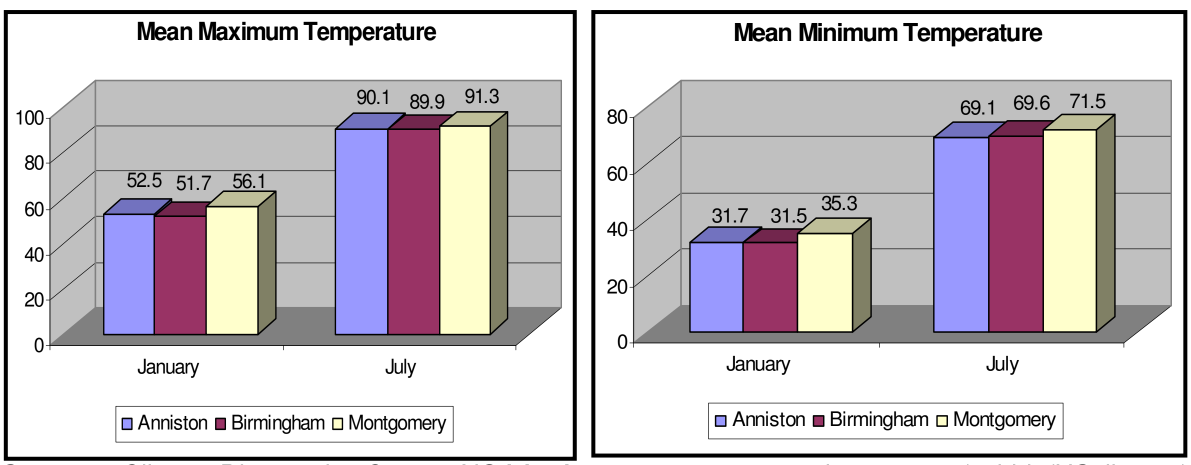
The Lower Coosa River Basin has a temperate to subtropical climate characterized by mild and humid conditions. The area has four distinct seasons with long, warm summers and short, mild winters. The land-surface altitude and distance from the Gulf of Mexico are major factors influencing climate in the basin. In the summer months, the Gulf of Mexico produces warm, humid air masses that move inland and provide precipitation in the form of thunderstorms. Arctic fronts that move south from the mid-western part of the United States contribute most of the precipitation in the winter months.[6]

Precipitation in the Mobile River Basin is mainly rainfall with amounts reasonably distributed throughout the year. A distinct dry period usually occurs during midsummer to late fall, but the pattern may be disrupted by tropical depressions, storms and hurricanes, which enter the Gulf of Mexico and move inland in the late summer and early fall. These storms may produce an overabundance of rainfall and flooding. Snowfall accumulation is rare, with annual averages generally less than an inch.[6]

Coldest months in the Lower Coosa River Basin are generally December, January and February with average temperatures ranging from 41.5° F to 45.7 ° F in the northern part of the basin to 46.1° F to 49.8° F in the southern part of the basin. Warmest temperatures occur in June, July and August, with July being the hottest month. The average temperature in July is 79.8° F in the northern part of the basin and 81.3° F in the southern part of the basin.

Figure 9:

Lower Coosa River Basin Monthly Mean Temperatures
1961 to 1990



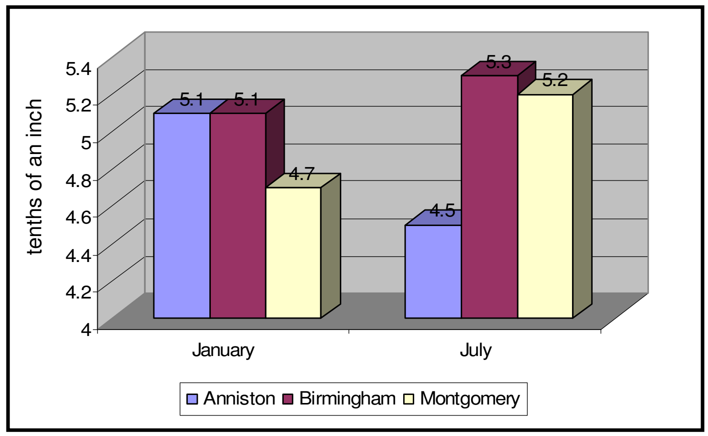
Source: Climate Diagnostics Center, NOAA. August, 2004. www.cdc.noaa.gov/cgi-bin/USclimate/

The National Oceanic and Atmospheric Administration's (NOAA) Climate Diagnostics Center provides climatological data for three weather stations in the vicinity of the Lower Coosa River Basin: one in Anniston, northeast of the basin; one in Birmingham, northwest of the basin; and, one in Montgomery, south of the basin. Climatological data, based on a 30-year period from 1961 to 1990, was obtained from these three stations to provide an overview of area weather, with the Anniston and Birmingham stations being representative of the northern portion of the basin and the Montgomery station being representative of the southern part. There is only slight fluctuation in temperature between the north and south ranges. As shown in Figure 9, the mean monthly maximum temperature in January is between 51.7° F and 56.1° F and between 89.9° F and 91.3° F in July. Mean monthly minimum temperatures range between 31.5° F and 35.3° F in January and 69.7° F and 71.5° F in July.

Morning humidity is generally high throughout the year ranging from about 80 percent in January and February to 90 percent in July, August and September. Afternoon humidity is lower, ranging from about 55 percent in the colder months to about 63 percent during the summer. The area climate does not have a dry season and severe drought is rare. The annual average chance of precipitation is 28.7 percent in Anniston, 31.7 percent in Birmingham, and 29.1 percent in Montgomery. The annual average wind speed is 6.4 miles per hour and the annual average percent of available sun is 58.25 percent. The mean annual precipitation ranges from 52.6 inches in Anniston to 54.6 in Birmingham. Mean annual snowfall is lowest in Montgomery, at 0.4 inches, and is 1.2 inches in Anniston and 1.4 inches in Birmingham.[7]

Figure 10:

Lower Coosa River Basin
Monthly Mean Precipitation
1961 to 1990



Source: Climate Diagnostics Center, NOAA. August, 2004. www.cdc.noaa.gov/cgi-bin/USclimate/

Drought

Although there are a variety of definitions, drought is best defined as "a condition of moisture deficit sufficient to have an adverse effect on vegetation, animals, and man over a sizeable area."[8] In the most general sense, drought originates from a deficiency of precipitation over an extended period of time, resulting in a water shortage for some activity, group, or environmental sector. Although drought occurs over an extended period of time, it is still a temporary aberration. Drought differs from aridity, which is restricted to low rainfall regions and is a permanent feature of the climate in those locations. Drought should not be viewed as merely a physical phenomenon or natural event. Its impacts on society result from the interplay between a natural event (less precipitation than expected resulting from natural climatic variability) and the demand people place on water supply. Three operational definitions of drought are:

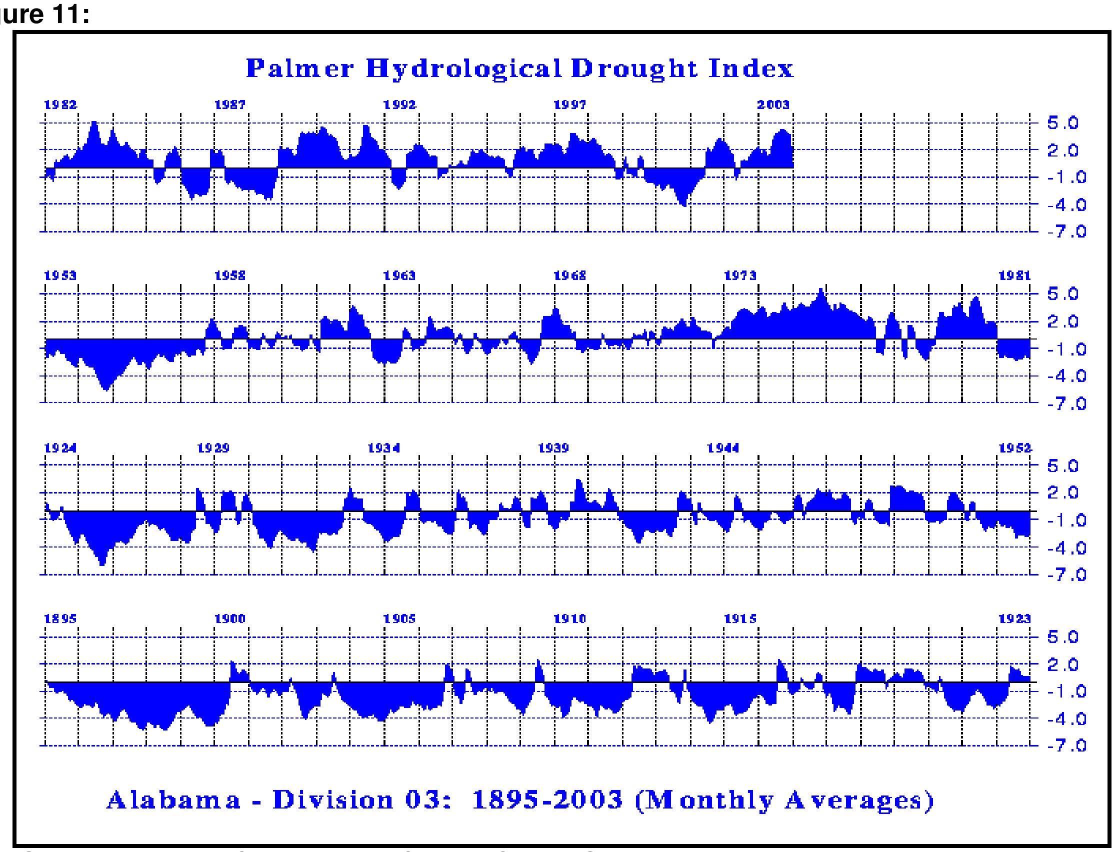
> <u>Meteorological drought:</u>
> A period of abnormally dry weather sufficiently prolonged for the lack of water to cause serious hydrologic imbalance in the affected area.

Agricultural drought:
A climatic occurrence involving a shortage of precipitation sufficient to adversely affect crop production or range production.

Hydrologic drought:
A period of below average water content in streams, reservoirs, ground-water aquifers, lakes and soils.[8]

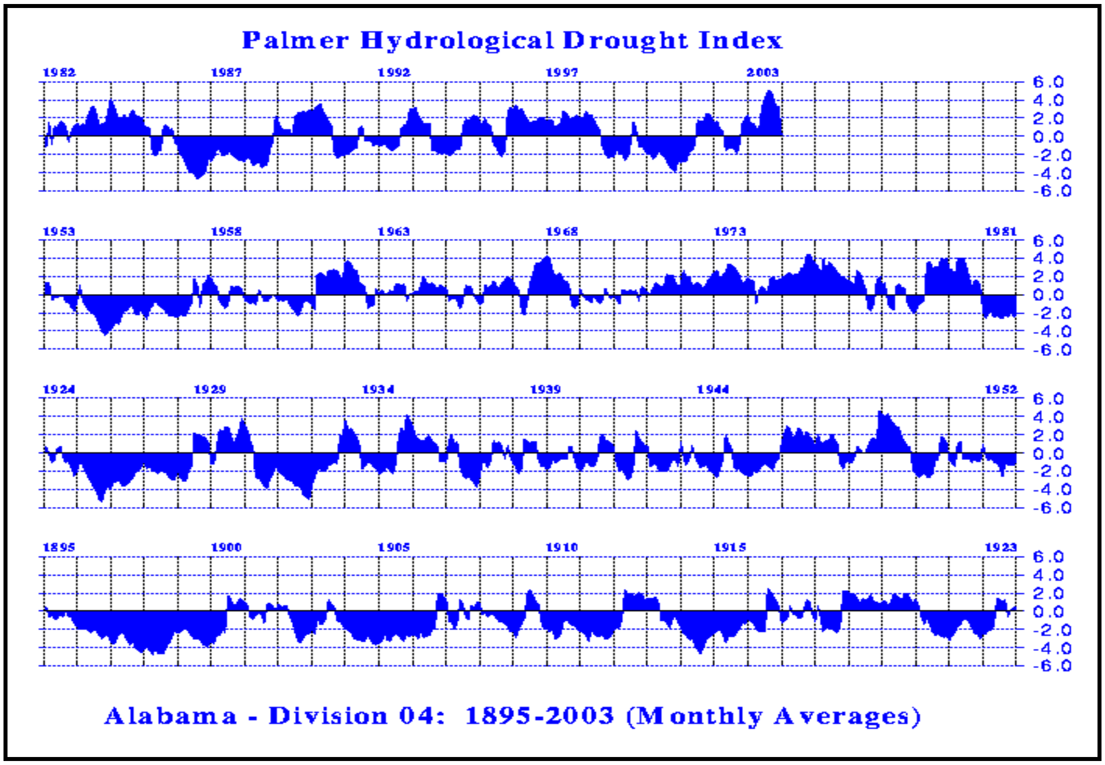
The Lower Coosa River Basin lies within three climatic divisions of the State. Division 3 includes Autauga and Chilton Counties. Division 4 includes Shelby and Talladega Counties. And, Division 5 includes Clay, Coosa and Elmore Counties. Historical drought conditions were collected for all three divisions using graphs of the Palmer Hydrological Drought Index. On the Palmer Index, a factor of 0 is normal, a factor of 4.0 or more is extremely wet, and a factor of -4.0 or less is extreme drought. Figures 11, 12, and 13 show the historical Palmer Hydrological Index for all three climatic divisions of the Lower Coosa River Basin from 1895 to 2003. The Index indicates a trend for decreasing hydrologic drought over the 108 year time frame, with hydrologic droughts becoming noticeably less frequent and less severe since the late 1950s. Prior to 1950, hydrologic drought was very frequent and often lasted two or more years. Between 1983 and 2003, severe hydrologic drought was reported in four years in one or all three of the climatic divisions, in 1986 through 1990 and again in 2000. Moderate hydrologic drought was reported in 1992 in Division 3, in 1990-91, 1993-94 and 1998-99 in Division 4, and in 1993-1995, 1998-99, and in 2002 in Division 5.[9]

Figure 11:



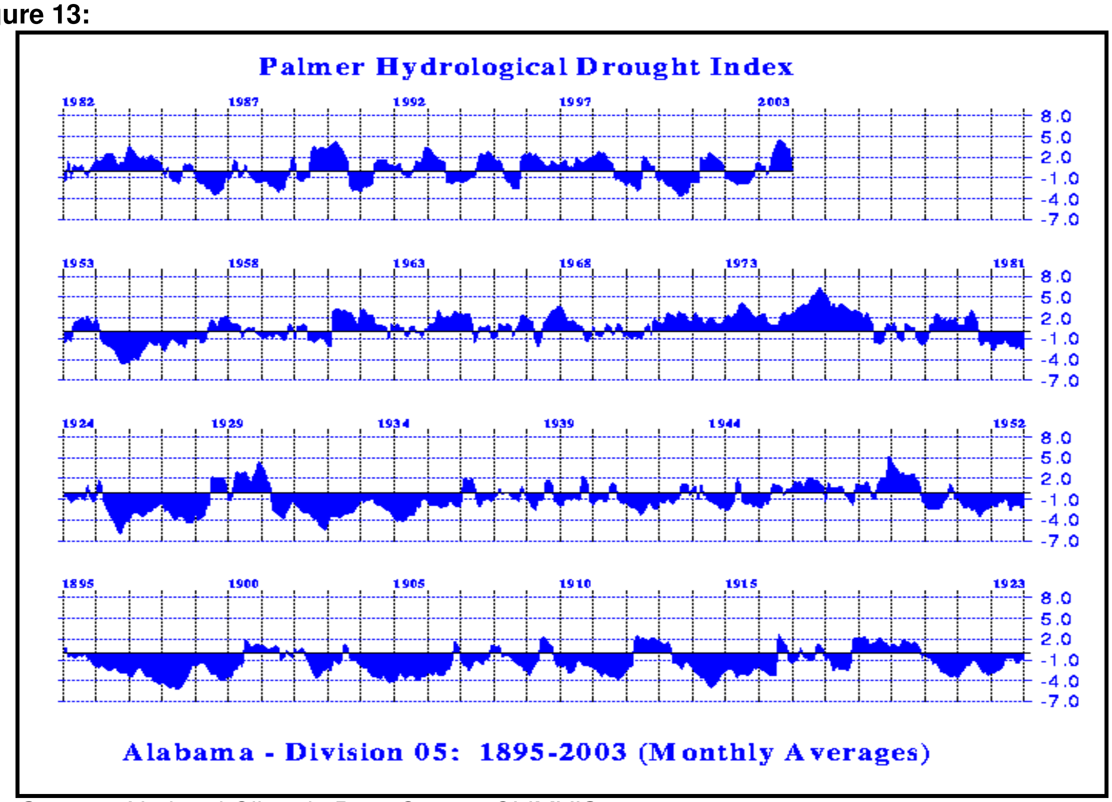
Source: National Climatic Data Center, CLIMVIS

Figure 12:



Source: National Climatic Data Center, CLIMVIS

Figure 13:

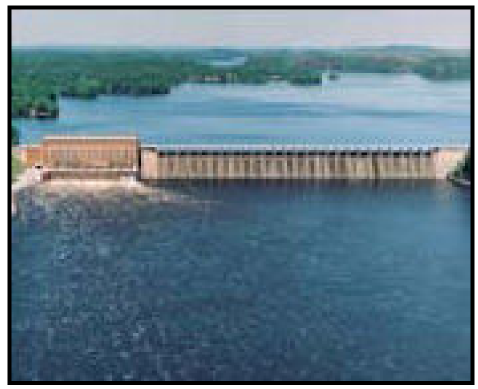


Source: National Climatic Data Center, CLIMVIS

Lakes and Dams

Seven Alabama Power Company dams form continuous impoundments over nearly the entire length of the Coosa River located in Alabama, with each dam discharging into the upper end of the next downstream impoundment. Four of these dams are located in the Lower Coosa River Basin: Lay, Mitchell, Jordan, and Bouldin. The upper three dams located north of the Lower Coosa River Basin (Weiss, H. Neely Henry, and Logan Martin) operate as hydropower peaking facilities, with releases occurring several hours each weekday and with minimal releases on the weekends to maintain minimum flow. The lower four dams (inside the Lower Coosa River Basin) operate generally as run-of-river projects for hydropower production and to maintain stable flows from Jordan Dam over the weekends when the upstream peaking facilities do not operate. Because the reservoirs provide continuous inundation from one dam to the next, the effects of the peaking operation are tempered and attenuated.[10]

Figure 14: Lay Dam and Lake



Source: Alabama Power Company

Construction on Lay Dam, which straddles the Chilton-Coosa County line just south of Shelby County, began in 1910. It was the first of the dams constructed on the Coosa River and the northernmost dam in the series of dams in the Lower Coosa River Basin. Originally known as Lock 12 Dam, it was renamed in 1929 in recognition of Captain William Patrick Lay who was the company's first president. The dam went into service in1914. It was later redeveloped in 1967 as part of an Alabama Company project that included construction of the three dams to the north, H. Neely Henry, Weiss and Logan Martin, and Bouldin Dam to the south. Lay Dam, a gravity concrete type, is 2,260 feet in length and has a maximum height of 129.6 feet. The dam includes six generators, each rating 29,500 kilowatts for a total generating capacity of 177,000 kilowatts. Lay Lake is approximately 12,000 acres in size with an elevation of 396 feet above sea level. The lake is 48.2 miles in length with a shore line of 289 miles and a maximum depth of 88 feet at the dam.

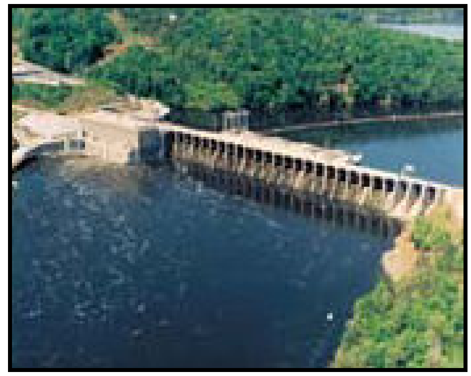
Figure 15: Mitchell Dam

Source: Alabama Power Company

Mitchell Dam, which also straddles the Chilton-Coosa County line, is located near Verbena at what was once known as Duncan's Riffle. It was Alabama Power Company's second dam on the Coosa River with construction of units one through three beginning in 1921. One unit was added in 1948, and in 1977, three more units were added. In 1985 a new powerhouse was constructed at the dam and the first three generating units were taken out of service. Mitchell Dam was named for James Mitchell, the company's president from 1912 to 1920. Mitchell Dam is also a gravity concrete type dam that is 1,277 feet long with a maximum height of 106 feet. Of the four generators now in service at the dam, one rates

20,000 kilowatts and the other three rate 50,000 kilowatts each, for a total generating capacity of 170,000 kilowatts. Lake Mitchell is the smallest of the three reservoirs in the Lower Coosa River Basin at 5,850 acres. It is 312 feet above sea level, 14 miles long and has 147 miles of shoreline with a maximum depth at the dam of 90 feet. Mitchell Dam also includes a fishing facility, located below the dam, which is open to the public all year with other facilities that include parking, restrooms, picnic tables and an overlook.

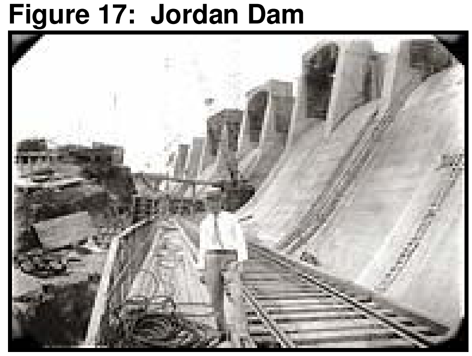
Figure 16: Mitchell Dam and Lake



Source: Alabama Power Company

Construction on Jordan Dam began in 1926 and it went into service on December 31, 1928. At the time of its construction, it was the largest power project built by private funds in the south. Its name is the maiden name of the mother of two brothers, Reuben and Sidney Mitchell, who played a major role in the early development of the Alabama Power Company. Jordan Dam is located about 14 miles north of Wetumpka at the beginning of what was once known as "Devils Staircase." This was the wildest part of the Coosa River, with the 14-mile stretch cascading over and around falls creating a roar of water that could be heard a mile from the river. The City of Wetumpka also takes its name from this area, as Wetumpka is an Indian word meaning "rumbling waters." A gravity concrete type dam, Jordan Dam is 252 feet in length and has a maximum depth of 110 feet. The dam has a total generating capacity of 100,000 kilowatts with four generators rating 25,000 kilowatts each.

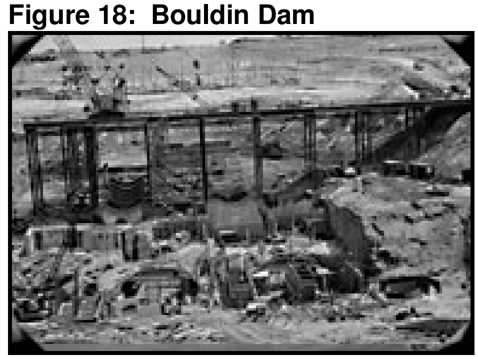
Figure 17: Jordan Dam



Source: Alabama Power Company

The last of Alabama Power Company's dams on the Coosa River to be constructed was Walter Bouldin Dam, which was built on a canal connected to Lake Jordan 40 years after Jordan Dam was complete. Construction began on Bouldin Dam in 1963 and it went into service on July 27, 1967. It has the largest generating capacity of any of the company's 14 hydro facilities. Each of the three generators at Bouldin Dam rates 75,000 kilowatts for a total generating capacity of 25,000 kilowatts. Bouldin Dam is gravity concrete and earth fill type dam. The length of the earth dikes are 10,950 feet and the length of the concrete is 228 feet. The maximum

Figure 18: Bouldin Dam



Source: Alabama Power Company

height is 120 feet. The length of the forbay reservoir is three miles. Lake Jordan is the reservoir for both Jordan and Bouldin Dams. It is 6,800 acres in size, 18.4 miles long and has 118 miles of shoreline. Maximum depth at Jordan Dam is 110 feet and at Bouldin Dam is 52 feet. Lake Jordan has an elevation of 252 feet above sea level.[11] Besides Alabama Power Company's hydro power dams located on the main stem of the Coosa River, there are approximately 84 other dams located within the basin on the streams and creeks that are tributaries to the Lower Coosa. These are primarily private dams for personal use on private property.

Significant and Historical Features

According to the Geographic Names Information System (GNIS), developed by the USGS in cooperation with the U.S. Board on Geographic Names (BGN), there are 2,203 named places in the Lower Coosa River Basin. The GNIS is our nation's official repository of domestic geographic names information. Figure 19 lists the type and number of each feature that is included in the GNIS database, and includes the number of those features that are historical features. Due to the sheer volume of named places in the basin, each of these will not be itemized in this plan. Instead, only significant, or major, physical, geographical and historical features will be described, beginning at the north end of the basin and working south. Following the description of the basin's significant features is a list of sites included on Alabama's Register of Landmarks and Heritage and the National Register of Historic Places. The lists of named places and historic sites are included as a reference to what sort of resources are located within the basin as a basis for making land use and water quality mitigation recommendations. The intent is to provide a balanced plan that ensures water quality while working within the parameters of what is already in place.

Figure 19:

Named Places Within the Lower Coosa River Basin

Type	Total Number	Number Historic	Type	Total Number	Number Historic
Airports	7		Lake	10	
Bar	7	3	Locales	166	
Basin	1		Mine	29	
Bend	7		Park	13	
Building	13		Post Office	26	10
Canal	1		Range	1	
Cemetery	263		Reservoirs	100	
Churches	386		Ridge	13	
Civil Division	23		Schools	121	43
Cliffs	2		Spring	13	
Crossing	21		Stream	292	
Dam	91		Summit	39	
Falls	3		Swamp	2	
Forest	1		Tower	15	
Gap	19		Valley	3	
Hospital	7	3			
Island	15	4			

Source: Montana State University Environmental Statistics Group, Geographical Locator, GNIS, Last Updated May 31, 2002, www.esg.montana.edu

Figure 20:

Sites in the Lower Coosa River Basin
Listed On The Alabama Register of Landmarks and Heritage

Site	County	Date Constructed	Date Listed
Confederate Memorial Cemetery, Mountain Creek	Chilton	1903-1933	1976
Lay Dam, Coosa River, near Clanton	Chilton	1910-1914	1976
Matthews-Reynolds Home, Clanton	Chilton	1908-09	1975
Mims Ferry, Coosa River	Chilton-Coosa	1895; 1957	1975
Tomlinson House, Jemison	Chilton	1893	1986
Midway School, Hollins	Clay	1917	1996
Carmichael Place, Goodwater	Clay	1887	1994
Old Rockford Elementary School, Rockford	Coosa	1927	1999
James Powell House, Rockford	Coosa		1996
Rockford Women's Club House, Rockford	Coosa	1932	1996
Weogufka State Park	Coosa		
Florence Bateman House, Wetumpka	Elmore	1842	1977
Francis Beaulieu House	Elmore	1816	1977
Bibb-Graves Bridge, Wetumpka	Elmore	1931	1977
Busch Log Cabin, Wetumpka	Elmore	1935	1991
Crommelin's Landing, Wetumpka	Elmore	1820	1977
Edward Rock Dogtrot House, Wetumpka	Elmore	1830	1977
Elmore County Courthouse, Wetumpka	Elmore	1931	1977
Elmore County Training School, Wetumpka	Elmore	1924	2002
First Baptist Church, Wetumpka	Elmore	1846	1977
Gantt Dogtrot House, Titus	Elmore		1977
Hagerty-Turner-Yung House, Wetumpka	Elmore	1840-1860	1999
Crommelin House, Wetumpka	Elmore	1905	1977
John Howle House, Wetumpka	Elmore	1904-1905	1986
Jasmine Hill Gardens, Wetumpka	Elmore	1820	1977
Jordan Dam, Wetumpka	Elmore	1927	1976
McCowen House, Wetumpka	Elmore	1904-1905	1977
Museum of Music, Wetumpka	Elmore		1977
Old Calaboose, Wetumpka	Elmore	1840	1976
Old Wetumpka Post Office, Wetumpka	Elmore	1937	1999
Swayback Bridge, Wetumpka	Elmore	1931	1977
Titus Historic District, Titus	Elmore	1800	1978
Tuskeena Street District, Wetumpka	Elmore		1977
Tom Wall House, Wetumpka	Elmore	1830	1980
Wetumpka Lock, Coosa River, Wetumpka	Elmore	1896	1977
Christian Wingard Home Place, Wetumpka	Elmore	1937	1995
The Brick House, Shelby	Shelby		1988
Calera Presbyterian Church, Calera	Shelby	1885	1997
Carter Residence, Calera	Shelby	1915	1977
Chancellor House, Harpersville	Shelby	1935	1978
Cowart Drug Store, Calera	Shelby	1885	1977
John E. Densler House, Wilsonville	Shelby	1879	2000
Klein-Wallace Home, Harpersville	Shelby	1841	1978
Mt. Calvary Baptist Church, Chelsea	Shelby	1905	1985
Old Shelby Hotel, Shelby	Shelby	1900	1977
People's Hotel, Calera (demolished)	Shelby	1909	1976
Rock House, Harpersville	Shelby	1835	1992
Scott-Bradford Home, Harpersville	Shelby	1824-1830s	1978

Continuation of Sites in the Lower Coosa River Basin Listed On The Alabama Register of Landmarks and Heritage			
Site	**County**	**Date Constructed**	**Date Listed**
Woods-Cleveland-Cooling House, Wilton	Shelby	1845	1978
Butler-Harris-Rainwater House, Childersburg	Talladega	1890s	1994
DeSoto Caverns, Childersburg	Talladega	Prehistoric	1976
Fairfax Station, Winterboro	Talladega	1850	1995
Fort Williams Cemetery, Coosa River, Fayetteville	Talladega	1813	1976
Birdie Guy House, Sylacauga	Talladega	Late 1800s	1980
Hightower Brothers Livery Stable, Sylacauga	Talladega	1914-1946	1996
Lanning-Livingston Home, Sylacauga	Talladega	1901	1980
Marble City Cemetery, Sylacauga	Talladega	1898	1995
Porch-Drake House, Sylacauga	Talladega	1914-1915	1978
Robinson (Baker) House, Childersburg	Talladega	1885	1976
Smith (Towassa) House, Sylacauga	Talladega	1909	1998
Sylacauga Cemetery, Sylacauga	Talladega	1832-1900	1975
Source: Alabama Register of Landmarks and Heritage, August 2004, www.preserveala.org			

Figure 21:

Sites In the Lower Coosa River Basin Listed On The National Register of Historic Places		
Site	**County**	**Date Listed**
Gragg Field Historic District, Clanton	Chilton	2004
Verbena	Chilton	1976
Coosa County Jail, Rockford	Coosa	1974
Alabama State Penitentiary, Wetumpka	Elmore	1973
East Wetumpka Commercial District, Wetumpka	Elmore	1992
First Presbyterian Church of Wetumpka, Wetumpka	Elmore	1976
First United Methodist Church, Wetumpka	Elmore	1973
Fort Toulouse, Wetumpka	Elmore	1966
Hickory Ground, Wetumpka	Elmore	1980
Wetumpka L&N Depot, Wetumpka	Elmore	1975
Chancellor House, Harpersville	Shelby	2001
Columbiana City Hall, Columbiana	Shelby	1974
Benjamin H. Averiett House, Sylacauga	Talladega	1986
William Averiett House, Sylacauga	Talladega	1986
Charles Butler House, Childersburg	Talladega	1996
Goodwin—Hamilton House, Sylacauga	Talladega	1986
Hightower Brothers Livery Stable, Sylacauga	Talladega	1997
Kymulga Mill and Covered Bridge, Childersburg	Talladega	1976
Sylacauga Historic Commercial District, Sylacauga	Talladega	2004
William Watters House, Sylacauga	Talladega	1987
Welch-Averiett House, Sylacauga	Talladega	1986
Source: National Park Service, National Register of Historic Places. August 2004. www.cr.nps.gov		

The Childersburg area is now recognized as the oldest settlement in the United States as it was visited by Hernando DeSoto in 1540, which was 25 year prior to the founding of St. Augustine, which is believed to be the oldest city in the U.S. Known as Old Coosa, it was the political power base of the great Indian Chieftain Tuscaloosa, who also kept a military base at Maubila (near Mobile). DeSoto's exploring army of 2,600 men, after exploring the area, took Tuscaloosa prisoner and forced him to go to Maubila for the big battle where

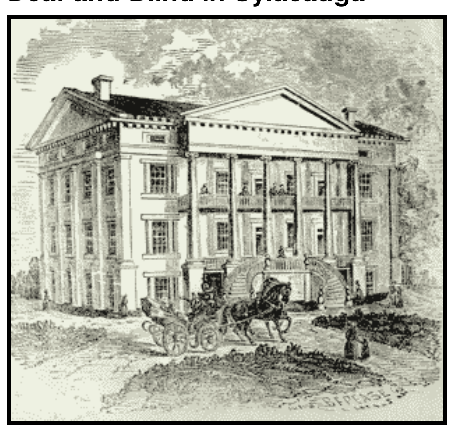
11,000 Coosa Indians were slain. This battle apparently destroyed the Tuscaloosa empire forever.[10] Two features near Childersburg are DeSoto Caverns Park and the Kymulga Covered Bridge. DeSoto Caverns Park is the location of the first recorded cave in the United States. In 1796, Benjamin Hawkins, General Superintendent and US Agent for all tribes south of the Ohio River, visited the cave and described its natural beauty to then President George Washington. DeSoto Caverns Park is now a privately-owned tourist attraction featuring speleothem formations that include soda straws, stalactites, stalagmites, flowstones, and draperies. DeSoto Caverns Park is open to the public with an entrance fee to the cavern and theme park Once an Indian burial ground, the cave was a gunpowder mining center and was mined for saltpeter, a vital element in the process, during the Civil War. The cave has also been mined for onyx. DeSoto Caverns was opened as a “show cave” in 1965.[12] Also near Childersburg is the Kymulga Grist Mill Park, which includes the Kymulga Covered Bridge, which was built in 1861. The 105-foot bridge crosses Talladega Creek in the old Kymulga community. Kymulga Bridge was built just before the Civil War and a gristmill was constructed there during the war. Both the bridge and the mill have been restored in recent years and are open to the public. The park includes two miles of scenic nature trails. The Kymulga Grist Mill and Bridge were listed on the National Register of Historic Place in 1976.[13]

Figure 22: Desoto Caverns Park and Kymulga Bridge (below)

Source: City of Childersburg and Chamber of Commerce, August 2004, http://childersburg.com

The Talladega Division of the Talladega National Forest is located in the northeast portion of the Lower Coosa River Basin near Sylacauga. The Talladega National Forest stretches from Piedmont to Sylacauga, encompassing approximately 7,500 acres of camping, hiking, and backpacking resources, as well as innumerable opportunities for communing with nature’s splendor. A portion of the Talladega National Forest covers the southernmost extension of the Appalachian Mountain Range.

Figure 23: Alabama Institute for Deaf and Blind in Sylacauga



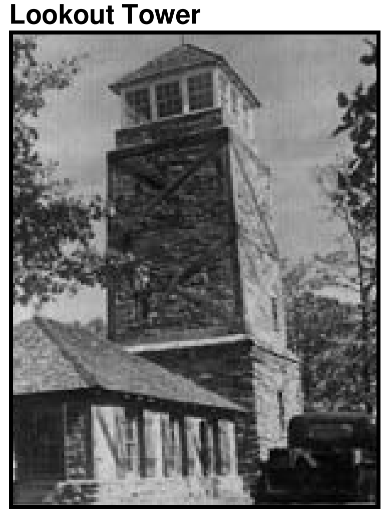
Source: Alabama Institute for Deaf and Blind, August 2004, http://www.aidb.org

The Alabama Institute for Deaf and Blind, located in Sylacauga is the world's most comprehensive education and rehabilitation system serving children and adults who are deaf, blind and multidisabled. Children ages 3 to 21 are served through Alabama School for the Deaf, the Alabama School for the Blind and the Helen Keller School of Alabama, accredited residential programs. E.H. Gentry Technical Facility is an accredited two-year technical school for sensory impaired adults. Alabama Institute for the Deaf and Blind was started by Dr. Joseph Henry Johnson and began with the enrollment of two students and grew to 22 by the end of the first year. Today, Alabama Institute for Deaf and Blind serves more than 11,600 people and their families each year. The first home for Alabama Institute for Deaf and Blind was the former East Alabama Masonic Female Institute. The spacious four story building featured sun-drenched classrooms and dormitory rooms on the first and second floor, teachers' accommodations in the attic, and a stable in the basement. Now named Manning Hall, it is home to AIDB's administrative offices, the Warren Museum, archives and a library.[14]

The Heart of Dixie Railroad Museum, the official railroad museum of the state of Alabama, is located in Calera. The museum features operating standard gauge and narrow gauge trains, two restored depots, an indoor collection of railroad artifacts and memorabilia, and an outdoor collection of railroad cars, locomotives, and cabooses, and old-fashioned train rides through scenic forests. The Heart of Dixie Railroad Museum is dedicated to the preservation, restoration, and operation of historically significant railway equipment.[15]

Weogufka State Forest is located in northwest Coosa County and includes Flagg Mountain, which at 1,152 feet above sea level, is one of the southernmost mountains above one thousand feet. The area includes hiking trails and the Flagg Mountain Lookout Tower, which has been listed on the National Historic Lookout Register. Built in 1935, the 50-foot stone lookout tower is a unique structure with walls that are two- to three-feet thick. The tower was staffed by the Alabama Forestry Commission until 1989 and has been leased to the Coosa County Cooperative for restoration.[16]

Figure 24: Flagg Mountain Lookout Tower



Source: National Historic Lookout Register, August 2004, www.firetower.org

The Water Course: An Alabama Center for Water and Environmental Education is a project of the Alabama Power Foundation featuring interactive exhibits that whet the imagination of visitors and encourage them to learn about Alabama waterways, environment, and impact of state's geography on everyday lifestyles.[17]

The Confederate Memorial Park, located in the Marbury community in Autauga County, is the site of Alabama's only home for Confederate veterans, serving between 650 and 800 residents between 1902 and 1939. The facility includes two cemeteries containing 313 graves. The museum houses Civil War uniforms, weapons and equipment, plus many relics from soldiers' homes. The site also includes walking and driving tours, a nature trail and picnic areas.[18]

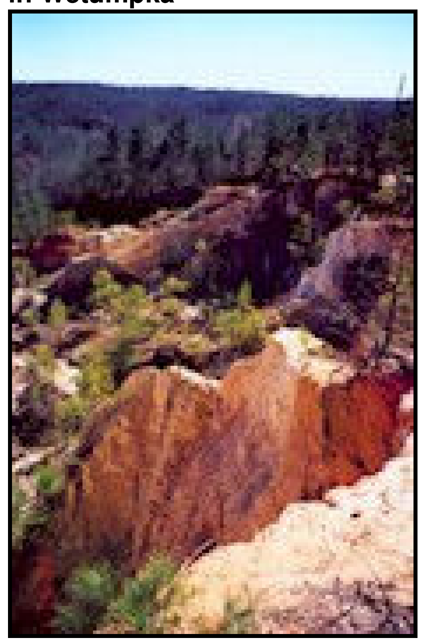
Built in 1931, Bibb-Graves Bridge in Wetumpka is the last bridge spanning the Coosa River before it joins with the Tallapoosa River and forms the Alabama River just south of Fort

Toulouse / Fort Jackson. Listed on the Alabama Register of Landmarks and Heritage in 1977, the bridge was designed by state bridge engineer Edward Houk and named after Alabama's first Governor Bibb Graves. A focal point for the City of Wetumpka, Bibb Graves Bridge is reported to be one of only two bridges south of the Mason-Dixon line to be suspended by reinforced concrete.[18]

Figure 25: Bibb-Graves Bridge in Wetumpka

Source: Wetumpka Chamber of Commerce, August 2004, www.wetumpkachamber.com

Figure 26: Bald Knob Mountain in Wetumpka



Source: Wetumpka Chamber of Commerce, August 2004, www.wetumpkachamber.com

At the southern extent of the Lower Coosa River Basin are the foothills of the Appalachian Mountains ending in Bald Knob Mountain in Wetumpka. The area is also home to the Wetumpka Astrobleme or "star-wound." The Wetumpka Astrobleme is an impact crater formed by a cosmic event that occurred some 80 to 83 millions years ago. It is one of the few above-ground impact crater locations in the United States and one of only about six in the entire World. Even more unusual is the fact that the structure is actually exposed. Despite the weathering that has occurred through millions of years, the crater walls are still prominent, so the rim was obviously much higher at one time. The projectile of the meteor impact was probably traveling between 10 and 20 miles per second. So this means the impact would have produced winds in excess of 500 miles per hour, and the meteor most likely struck at a 30-45 degree angle as it came from the northeast. Geologists determined that it came from the northeast by the angle at which the rocks are slanted within the impact area which includes the current flow path of the Coosa River. This can be seen looking from both directions on the Bibb Graves Bridge. Geologists also theorize that the strike area would have been under a shallow sea, perhaps 300 to 400 feet of water, which covered most of southern Alabama at the time of the impact. One distinctively unique feature is the impact crater's horseshoe-shaped ridge of rock which is not submerged in water or covered or eroded beyond visibility.[19]

Located at the confluence of the Coosa and Tallapoosa Rivers is Fort Toulouse / Fort Jackson State Historic Site, which has been a part of over 6,000 years of history. The park is open year round to the public and includes an A.D. 11 Mississippian Indian mound, a recreation of the 1751 French Fort Toulouse, and the partially restored 1814 American Fort Jackson. It was here that the Treaty of Fort Jackson was signed, marking the formal end of the bitter Creek war phase of the War of 1812. Fort Toulouse / Fort Jackson are also home to many natural wonders. William Bartram, a famed 18th-century botanist and friend of Benjamin Franklin, visited the site in 1776 creating notes and drawings of the area's flora and fauna.

The Graves House, a Carolina Tidewater Cottage built between 1825 and 1830 in Lowndes County, Alabama, was moved to the site and serves as the visitor center and museum. Books and souvenirs may be purchased and site artifacts may be viewed at the visitor center. The park also features a 39-unit RV campground, a boat launch, a picnic pavilion and open picnic areas and Bartram Nature Trail.[20]

Source Documents:

1. *Water Quality Management Plan: Coosa River Basin.* Alabama Water Improvement Commission. July 1976.

2. U.S. Geological Survey. August 2004. http://water.usgs.gov/GIS/huc_name.txt

3. Montana State University Environmental Statistics Group. September 4, 1999, Last updated January 23, 2003. Accessed August 2004. http://www.esg.montana.edu/gl/huc/03150107.html.

4. *Recovery Plan for Mobile River Basin Aquatic Ecosystem.* U.S. Fish and Wildlife Service, Southeast Region, Atlanta, Georgia. November 17, 2004.

5. *USGS Water Resources Region Descriptions*. U.S. Geological Survey. August 2004. http://water.usgs.gov/watuse/wuwrregions.html

6. Gregory C. Johnson, Robert E. Kidd, Celeste A. Journey, Humbert Zappia, and J. Brian Atkins. *Environmental Setting and Water-Quality Issues of the Mobile River Basin, Alabama, Georgia, Mississippi, and Tennessee.* U.S. Geological Survey. Water-Resources Investigations Report 02-4162**.** Montgomery, Alabama. 2002.

7. Climate Diagnostics Center, NOAA. August, 2004. www.cdc.noaa.gov/cgi-bin/USclimate/

8. U.S. Geological Survey, Alabama Office of Water Resources. Definitions of Drought. http://md.water.usgs.gov/drought/define.html

9. National Climatic Data Center, CLIMVIS - Climate Visualization System. http://climvis.ncdc.noaa.gov/onlineprod/drought/main.html

10. *Water Allocation for the Alabama-Coosa-Tallapoosa (ACT) River Basin.* Main Report. U.S. Army Corps of Engineers, Mobile District. September 1998.

12. Alabama Power Company. August 2004. www.southerncompany.com

13. DeSoto Caverns Park. August 2004. www.desotocavernspark.com

14. The City of Childersburg and The Chamber of Commerce. August 2004. http://childersburg.com/attractions

15. The Alabama Institute for Deaf and Blind. August 2004. http://www.aidb.org

16. Heart of Dixie Museum. August 2004. www.heartofdixiemuseum.org

17. National Historic Lookout Register. August 2004. www.firetower.org

18. Alabama Bureau of Tourism and Travel. August, 2004. http://www.800alabama.com/alabama-attractions

19. The Wetumpka Chamber of Commerce. August 2004. www.wetumpkachamber.com

20. Alabama Historic Commission. August 2004. www.preserveala.org

Chapter 2
Physical Characteristics

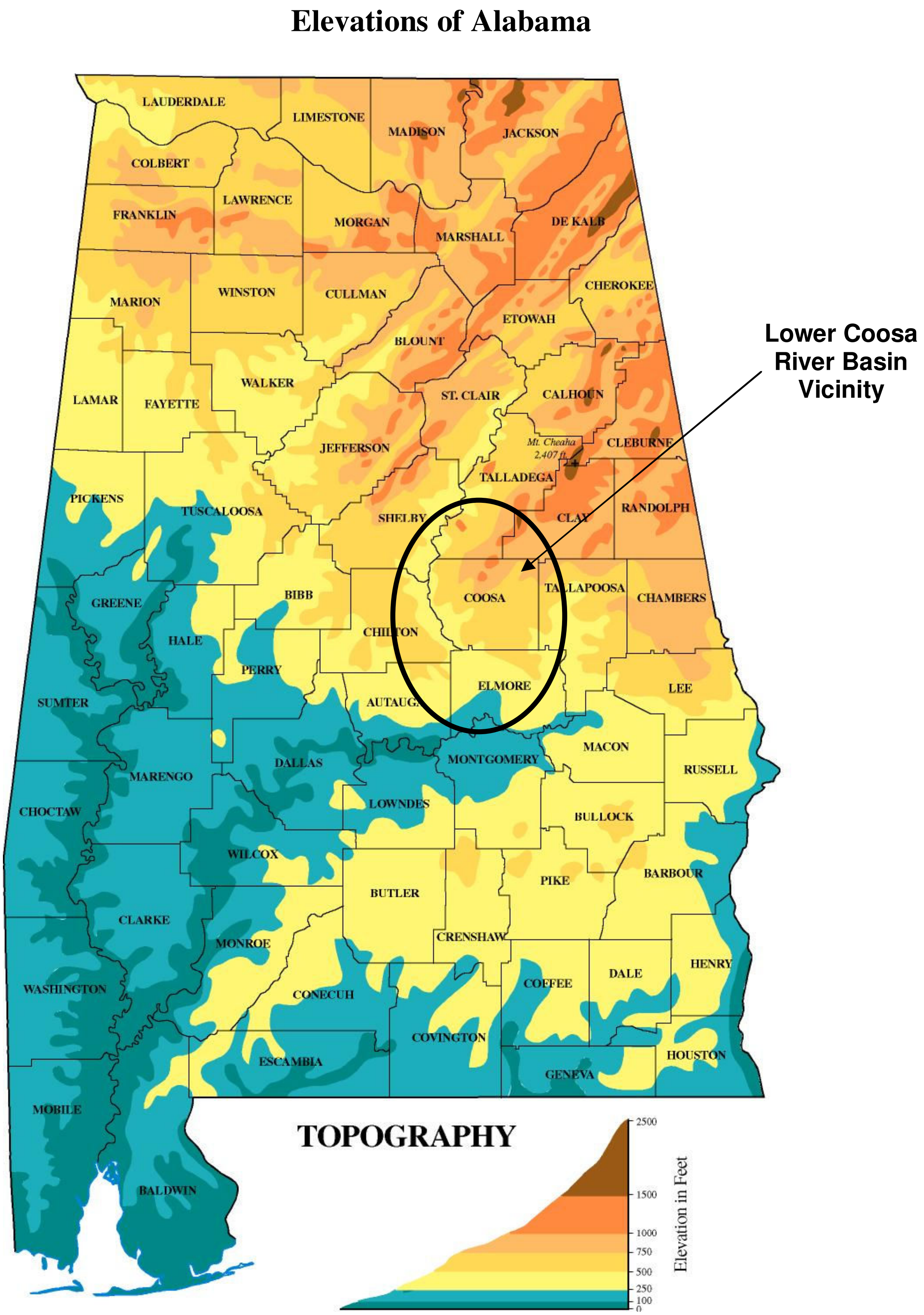
The existing physical features, or characteristics, of the Lower Coosa River Basin are a major factor in watershed management and in planning and guiding future types of development in the basin area. These are characteristics that are not easily changed, i.e., they are inherent to the land. Therefore, all future management strategies, as well as all future development plans, should be developed around what is already there, taking care to recognize areas that are sensitive to structural development and limiting growth in these areas, while maximizing those areas that are highly suitable for structural development.

Physical characteristics that will be discussed in this chapter include topography, geology, minerals, flood plains, soils, and wetlands. Each of these characteristics will be discussed generally in this chapter to provide a broad perspective description of the physical conditions present in the entire Lower Coosa River Basin. More detailed information on some of the characteristics – soils, floodplains and wetlands – is provided in a separate companion document entitled *Atlas of Lower Coosa River Watersheds*. The more detailed information found there is intended to give local residents the working knowledge necessary to successfully implement the watershed management measures pertaining to their watershed.

Topography

The topography of the Lower Coosa River Basin reflects the larger physiographic provinces, or divisions, within Alabama. The Southern Coastal Plain province covers the majority of Elmore County, the entire northeast corner of Autauga County, and the majority of southwest Chilton County. The Southern Piedmont province covers a small portion of northern Elmore County, all of Coosa County, the northeast corner of Chilton County, a small portion of the southeast corner of Shelby County and small tips along the south and eastern part of Talladega County. The Southern Appalachian Ridge and Valley province covers the majority of Talladega County west to the Coosa River and Shelby County east to the Coosa River. Only a small part of northwest Shelby County is located in the southern part of the Sand Mountain Ridgeline.

Figure 27:



Source: University of Alabama, Department of Geography. Alabama Maps. http://alabamamaps.ua.edu/alabama/physical/index.html

The northern portion of the Lower Coosa River Basin, primarily influenced by the Southern Appalachian Valley and Ridge province, is often referred to as the Coosa Valley. The area contains a series of wide, gently rolling valleys and steep, rough ridges aligned from the southwest to the northeast. These valleys and ridges influence transportation, agriculture and streams. Elevations in the valleys range from 500 feet to 700 feet above sea level and the higher ridges extend to 1,500 feet or more above sea level.

The southern portion of the Lower Coosa River Basin is primarily influenced by the Southern Piedmont province. The area can be characterized as moderately rolling uplands. Elevations range from 700 feet to 1,000 feet above sea level. Both the slope and elevation of land decrease moving farther south in the Southern Piedmont area.

The Southern Piedmont province is distinctly separated from the Southern Coastal Plain province by the fall line hill area. The fall line varies from 15 miles to 50 miles in width and broad ridge areas separate valleys that range from 100 feet to 200 feet deep when compared to adjacent ridge areas. In the southern portion of the Lower Coosa River Basin, the fall line dissects the Coosa River north of Wetumpka and swoops northwesterly into Chilton County.

The southernmost part of the Lower Coosa River Basin opens into the Southern Coastal Plain province. These upper portions of the Coastal Plain exhibit more roughly rolling land, with elevations varying from 300 feet to 600 feet above sea level.[1]

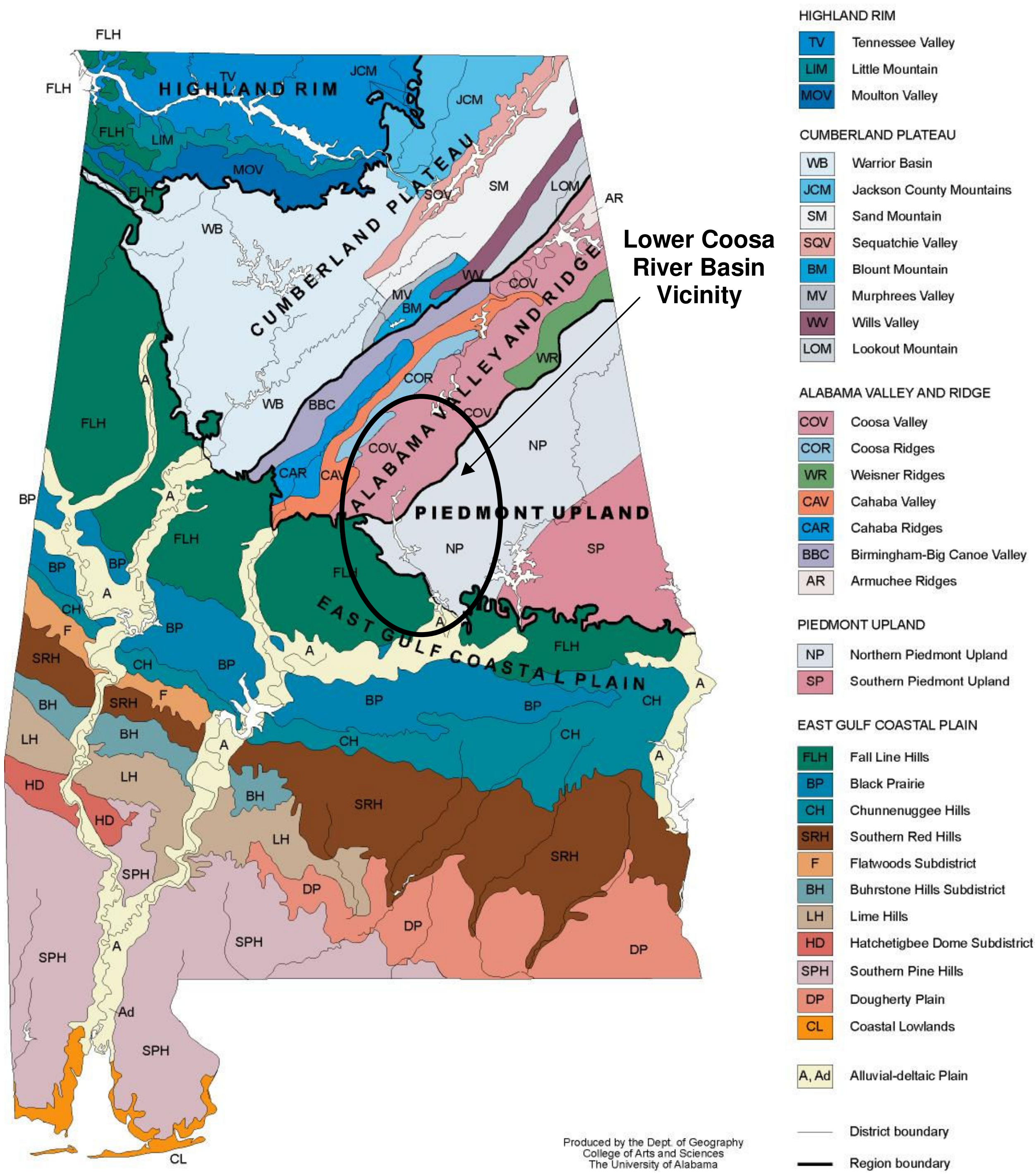
Geology

The Lower Coosa River Basin lies in three of Alabama's five physiographic provinces: the Eastern Valley and Ridge Province, the Northern Piedmont Province, and the Coastal Plain Province. The Shelby County and the western Talladega County portions of the basin lie within the Eastern Valley and Ridge Province; southwestern Talladega County, Coosa County, eastern Chilton County and northern Elmore County lie within the Northern Piedmont Province; and central Chilton County, northeastern Autauga County, and southern Elmore County lie in the Coastal Plain. The following information regarding the geologic formations found in these provinces was compiled from the Geologic Map of Alabama produced by the Geologic Survey of Alabama in 1988.

Major geological formations in the Valley and Ridge portion of the basin include the Parkwood formation and Floyd Shale in Shelby County, and the Knox group in Talladega County, both of which are part of the Mississippian Geologic System. The Parkwood formation is interbedded medium to dark-gray shale and light to medium-gray sandstone. Locally, it contains dusky-red and grayish-green mudstone, argillaceous limestone, and clayey coal. The Floyd shale is a dark-gray shale, sideritic in part with thin beds of sandstone, limestone and chert present locally. The Knox Group is comprised of light-gray to light-brown locally sandy dolomite, dolomitic limestone, and limestone and characterized by abundant light-colored chert. Other formations in the Valley and Ridge Province portion of the basin include Newala Limestone, Tuscumbia Limestone and Fort Payne Chert, and Athens Shale.

Figure 28:

Physiographic Regions of Alabama



Source: University of Alabama, Department of Geography. Alabama Maps. http://alabamamaps.ua.edu/alabama/physical/index.html

Major formations in the Northern Piedmont Province include Waxahatchee Slate in Shelby County; Wash Creek Slate and the Lay Dam Formation in Talladega County; the Lay Dam Formation and Jemison Chert and Chulafinnee Schist in Clay County; the Lay Dam Formation, the Wedowee Group, and the Higgins Ferry Group in Chilton County; Jemison Chert and Chulafinnee Schist, Pinchoulee Gneiss and the Higgins Ferry Group in Coosa County; and in Elmore County, Elkahatchee Quartz Diorite Gneiss, the Emuckfaw Group, and Kowaliga Gneiss.

The Waxahatchee Slate is a dark-gray to grayish-green thin-bedded, micaceous metasiltsone, slate and fine-grained quartzite. The Wash Creek Slate is a grayish-green to black micaceous, partly carbonaceous to graphitic slate and metasiltstone containing interbedded light-gray to light-brown fine to coarse-grained metasandstone. The Lay Dam Formation is interbedded dark-green phyllite, medium-gray to light-brown and black metasiltone, with dark-green feldspathic metagraywacke, and white to light-gray and dark-gray to medium to coarse-grained arkosic quartzite and metaconglomerate. In Clay County, the upper part of the Lay Dam Formation includes black graphitic sericite phyllite and slate reportedly containing plant fossils. There is also an unnamed diamictite facies of the Lay Dam Formation in Chilton and Clay Counties that consist of cobbles and boulders of carbonate, politic rocks, quartzite, chert, felsic plutonic rocks, and gneiss in a metagraywacke matrix.

The Jemison Chert and Chulafinnee Schist are grayish-white to yellowish-orange massive, thick-bedded, fine-grained, locally argillaceous, locally fossiliferous metachert and light to dark greenish-gray fine to medium-grained fissile quartz-sericite chlorite phyllite and schist which locally includes thin chlorite phyllite and quartzose phyllite beds.

The Wedowee Group undifferentiated includes the Cragford Phyllite and Cutnose Gneiss. Cragford Phyllite is interbedded fine-grained graphite-chlorite-sericite schist and phyllite, garnet-sericite schist and phyllite, graphite-quartz-sericite phyllite, locally feldspathic biotite gneiss, calc-silicate rock, and quartzite. Cutnose Gneiss is cyclically interbedded fine-grained quartz-biotite feldspathic gneiss, graphite-chlorite-sericite schist, with locally thin interbeds of graphite-quartz-sericite-phyllite, and quartzite.

The Higgins Ferry Group consists of thinly layered, coarse to fine-grained biotite-feldspar-quartz gneiss, sericite-feldspar-muscovite schist and biotite-garnet felspathic gneiss with locally common pegmatites. Pinchoulee Gneiss is a medium to fine-grained mimatitic, local garnetiferouse bitite-feldspar gneiss, commonly saturated with granitic pods.

The Emuckfaw Group includes interbedded muscovite, with and without garnet-biotite schist, metagraywacke, calc-silicate rock and quartzite, and rare thin amphibolite. It includes thin layers of aluminous graphitic schist, locally sheared to mylonite schist.

The Elkahatchee Quartz Diorite Gneiss is a mesocratic to melanocratic, fine to coarse-grained, massive to strongly foiated, locally sheared quartz diorite gneiss. The Kowaliga Gneiss is coarse-grained granodiorite to quartz monzonite with large plagioclase augen, generally sheared along margins.

Other geologic formations in the Northern Piedmont Province present to a lesser extent include brewer phyllite and the Stumps Creek Formation in Shelby County; gooch branch chert, jumbo dolomite, Fayetteville phyllite, and metaclastic rocks of an unknown affinity in Talladega County; hillabee greenstone, Mitchell Dam amphibolite, and Rockford granite in Clay County; garnet quartzite from the Higgins Ferry Group and Mitchell Dam amphibolite in Chilton County; kalona quartzite member of the Wash Creek Slate formation, Wash Creek slate, Stumps Creek Formation, jumbo dolomite, hillabee greenstone, the Wedowee Group, Mitchell Dam amphibolite, Hanover schist, Rockford granite, and Hissop granite in Coosa County; and in Elmore County, the Wedowee Group and Zana granite.

Major formations in the Coastal Plain Province include the Coker Formation in Chilton and Elmore and Autauga Counties, and high terrace deposits in Elmore and Autauga Counties. The Coker Formation is light-gray to moderate-reddish-orange poorly sorted, clayey, gravelly fine to very coarse sand with interbeds of grayish-green to moderate-red sandy clay and well-sorted medum quartz sand. Gravels consist mostly of quartz and quartzite and range in size from very fine pebble to large cobbles. In southeastern Elmore County, the formation includes marine sediments consisting of glauconitic, fossiliferous, quartzose fine to medium sand, and medium-gray carbonaceous, silty clay. The high terrace deposits are varicolored lenticular beds of poorly sorted sand, ferruginous sand, silt, clay, and gravelly sand. The sand primarily consists of very fine to very coarse poorly sorted quartz grains, gravel composed of quartz, quartzite, and chert pebbles. Other geologic formations in the Coastal Plain Province present to a lesser extent include Alluvial and low terrace deposits in both Chilton and Elmore Counties and the Gordo Formation in Chilton County. [2]

Minerals

The State of Alabama is ranked 17th among all 50 states in total nonfuel mineral production value, of which Alabama accounted for more than 2 percent of the U.S. total, according to the USGS 2003 Minerals Yearbook. In 2003, the estimated value of nonfuel mineral production for Alabama was $863 million, based upon preliminary USGS data, representing a 2 percent increase from 2002, following a 10.4 percent decrease from 2001 and 2002. The top four nonfuel mineral commodities produced in Alabama in 2003 continued to be cement (portland and masonry), crushed stone, lime and construction sand and gravel. Together, these four minerals made up more than 93 percent of the State's total nonfuel mineral production value.[3]

The counties that comprise the Lower Coosa River Basin do not have abundant mineral resources and there are no fuel minerals present in the basin at all. Minerals produced in the counties of the Lower Coosa River Basin include crushed stone, which is produced in Coosa, Shelby and Talladega Counties; clay, which is produced in Chilton, Elmore and Shelby Counties; industrial sand and gravel, which is produced in Chilton and Elmore Counties; and construction sand and gravel, which is produced in Autauga County.[3]

Only Coosa County has any significant mineral resources, beyond what is listed previously in the mineral production. Deposits of graphite lie across Coosa County, stretching from the southwest near Lake Mitchell to the northeast near Goodwater. To the southeast of the graphite deposits, but to a lesser extent, are mica deposits. There are 14 abandoned mica mines following the deposit formations. There is a small sand and gravel deposit just east of the Coosa River near the Elmore-Coosa County line and there are several small gold and pyrite deposits along the east side of the Coosa River near Lake Mitchell and one located northwest of Flagg Mountain. Other mineral resources in the Lower Coosa River Basin include a sand and gravel quarry in Chilton County, two limestone and marble mines (one of which is a strip mine) and a barite mine in Talladega County.[4]

Soils

General soil information for the Lower Coosa River Basin is provided using large land divisions called *Major Land Resource Areas* (MLRAs), which are defined by the Natural Resource and Conservation Service (NRCS) as geographically associated land resource units. Identification of these large areas is important in statewide agricultural planning and has value in interstate, regional, and national planning. *Land Resource Units* (LRU's) are the basic units from which MLRA's are determined. They are also the basic units for state land resource maps. They are coextensive with state general soil map units, but some general soil map units are subdivided into land resource units because of significant geographic differences in climate, water resources, and land use. More detailed soil information at the watershed level is available in a separate companion document entitled *Atlas of Lower Coosa Watersheds*.[5]

The dominant physical characteristics of the major land resource areas are land use, elevation and topography, climate, water, soils, and potential natural vegetation. As used by the NRCS in describing MRLAs, these physical characteristics are defined as follows:

> *Land use*. The relative extent of the federally or privately owned land is indicated if significant. The extent of the land used for cropland, pasture, range, forests, industrial and urban developments, and other special purposes is indicated. These fractions or percentages are for the entire resource area unless specifically stated otherwise. Also included is a list of the principal crops grown and the type of farming practiced.
>
> *Elevation and topography*. A range in height above sea level and significant exceptions, if applicable, are provided for the area as a whole. The topography of the area, including natural and cultural features, is described.
>
> *Climate*. Climatic data discussed are: (1) A range of the annual precipitation for the driest parts of the area to the wettest and the seasonal distribution of precipitation and (2) a range of the average annual temperature and the average freeze-free period characteristic of different parts of the resource area.
>
> *Water*. Information is provided concerning surface streamflow and ground water and the source of water for municipal use and for irrigation. Also, land resource areas dependent on other areas for water supply and those that furnish water to other areas are specified.

Soils. The dominant soils of the major land resource area are identified according to the principal suborders, great groups, and representative soil series.

Potential natural vegetation. The plant species that the major land resource area can support are identified by their common names.

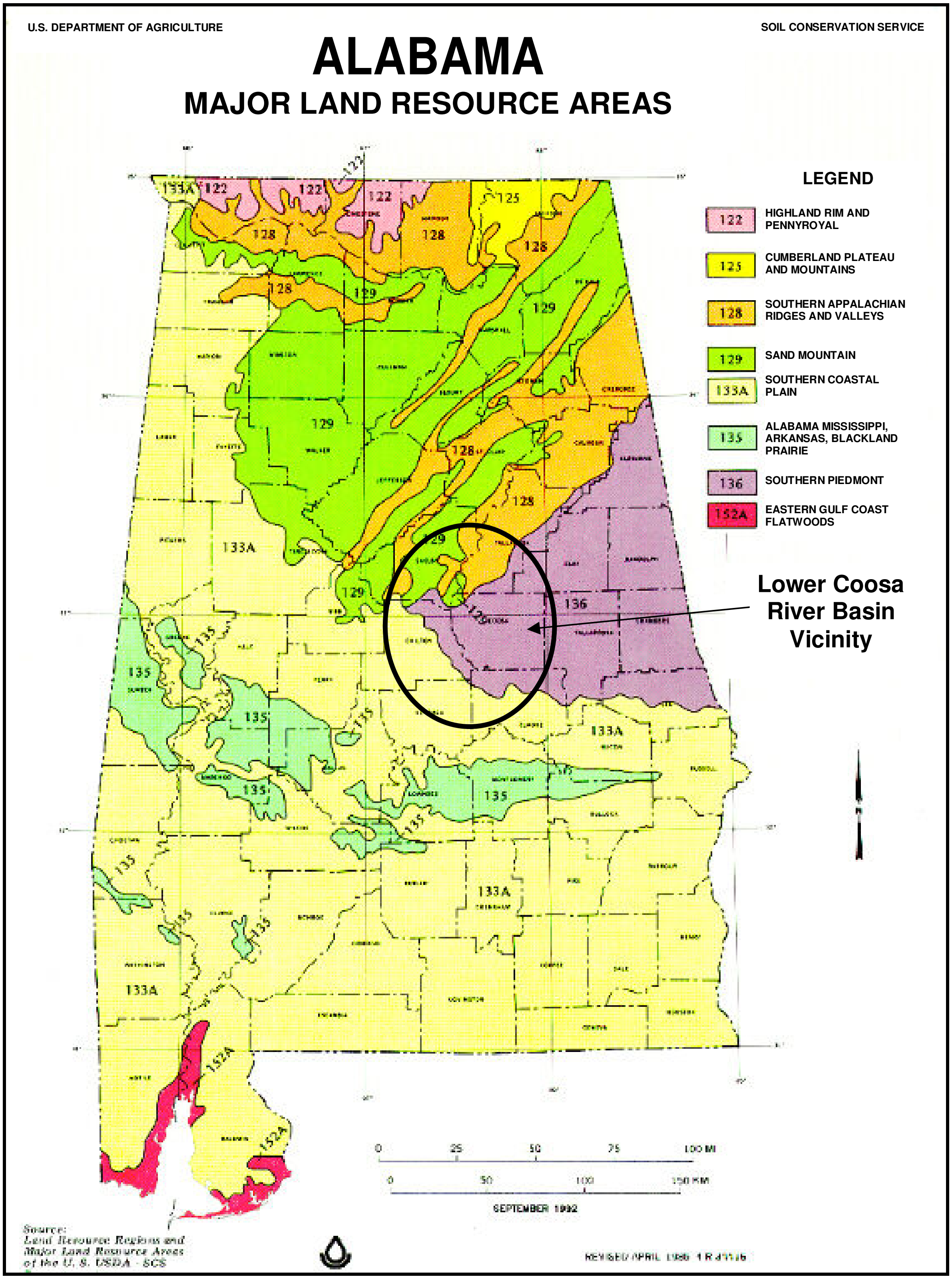
Within the Lower Coosa River Basin, there are four Major Land Resource Areas, which are the Southern Appalachian Ridges and Valleys, the Sand Mountain, the Southern Coastal Plain, and the Southern Piedmont. The northern part of the basin lies in the Southern Appalachian Ridges and Valleys, Sand Mountain and Southern Piedmont MRLAs with the western Shelby County portion of the basin lying in the Sand Mountain MRLA, the eastern Shelby County and the western Talladega portion in the Southern Appalachian Ridges and Valleys MRLA, and the eastern Talladega County portion lying in the Southern Piedmont MRLA. In the central portion of the basin, western Chilton County lies in the Southern Coastal Plains MRLA and eastern Chilton County and all of Coosa County are in the Southern Piedmont MRLA. The southern part of the basin lies primarily in the Southern Coastal Plain MRLA, however, the northern part of Elmore County is in the Southern Piedmont MRLA.

Alabama has seven major soil areas which are consistent with the boundaries of the MRLAs. See Figure 29 and Figure 30. Most of the soils within each area were formed from materials with similar characteristics. Detailed soil surveys show that each area has several major soil series. A soil series is a part of the landscape with similarities among its properties such as color, texture, arrangement of soil horizons, and depth to bedrock. The NRCS description of each of the MRLAs that are found in the Lower Coosa River Basin follows, along with a description of the major soil area as provided by the Alabama Cooperative Extension System.

MRLA 128–Southern Appalachian Ridges and Valleys. Found in Alabama, Georgia, Tennessee, Virginia, and West Virginia, the Southern Appalachian Ridges and Valleys MRLA encompasses approximately 26,810 square miles in the southeastern United States. Most of this area consists of small and medium-size farms. About 40 percent is forests of mixed hardwoods, most of which, except for a few wooded mountain ridges, are in small farm woodcuts. A large acreage in Virginia is in the George Washington and Thomas Jefferson National Forests. Hay, pasture, and some grain for beef cattle and dairy cattle are the principal crops. Burley tobacco is the important cash crop in the southern two-thirds of the area (excluding Georgia). Some cotton is grown south of Chattanooga. Small acreages of corn and soybeans are grown throughout the area, mainly on narrow strips of bottom land and on adjacent low terraces.

Most of the soils are Udults and, to a lesser extent, Ochrepts. They have an udic moisture regime and a thermic or mesic temperature regime. The soils dominantly are well drained, strongly acid, and highly leached and have a clay-enriched subsoil. They range from shallow on the sandstone and shale ridges to very deep in the valleys and on the large limestone formations. Paleudults (Dunmore, Decatur, Dewey, Frederick, and Fullerton series, commonly cherty) are on the numerous and extensive areas underlain by limestone that traverse the region in a southwest-northeast direction. Hapludults (Sequoia series) are

Figure 29:



Source: Natural Resource and Conservation Service. Major Land Resources Areas in Alabama. http://www.mo15.nrcs.usda.gov/technical/mlra_al.html dominant in the valleys underlain by acid shale. Steep, shallow to moderately deep, shaly and stony Dystrochrepts (Muskingum, Weikert, Wallen, Litz, Lehew, and Calvin series) are on the sides of the steep ridges. Shallow, shaly Eutrochrepts (Dandridge series) are on the shale formation that extends along the eastern side of the area. Hapludolls (Huntington and Staser series) and Eutrochrepts (Chagrin, Hamblen, Lobdell, Sullivan and Lindside series) occupy the narrow strips of bottom land. The proportion of poorly drained soils, mainly Aquepts and Aquults, is very small.[6]

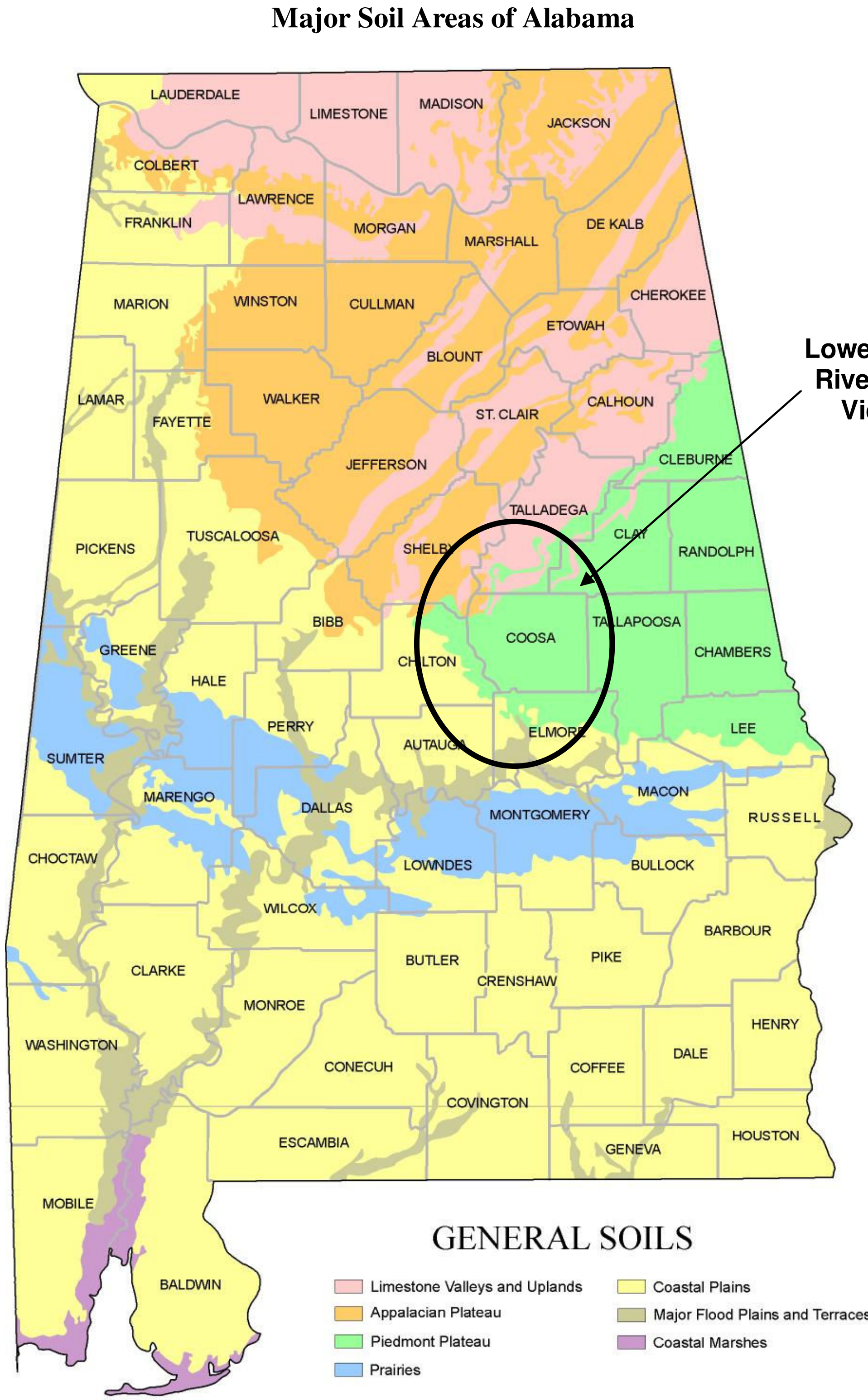
The Southern Appalachian Ridges and Valleys MRLA corresponds to the Limestone Valleys and Uplands Major Soil Area of Alabama. Soils in these areas were formed mainly in residuum weathered from limestones. Soils of the Tennessee and Coosa river valleys were weathered from pure limestones and are mainly red clayey soils with silt loam surface textures. Decatur and Dewey soils are extensive throughout the valleys. Topography is generally level to indulating. Elevation is about 600 feet. Most of the land is open and cropped to cotton or soybeans. Most of the soils of the uplands are derived from cherty limestones. Bodine and Fullerton soils are very extensive in many of these landscapes. They typically have cherty loamy and cherty clayey subsoils and cherty silt loam surface layers. Elevation is about 700 feet, and topography ranges from level to very steep. Cotton and soybeans are major row crops. Much of the area is used for pasture or forest.[7]

MRLA 129–Sand Mountain. Found in Alabama and Georgia, the Sand Mountain MRLA encompasses approximately 6,770 square miles. This area is about 70 percent woodland, 18 percent cropland, and 9 percent pastureland. About 3 percent is used for coal mining, urban development, or other purposes. About 83 to 88 percent of the woodland is privately owned, 10 to 15 percent industry owned, and about 2 percent federally owned. Timber production is mostly in the southern half of the area. Poultry production is the major farm enterprise. Corn, cotton, and vegetables are the major cash crops. Controlling erosion on soils that are cropped is the primary concern of management. Pastures are grazed mainly by beef cattle and are important disposal areas for poultry wastes.

The dominant soils are Udults and Ochrepts. They have an udic moisture regime, a thermic temperature regime, and mixed mineralogy. They are over sandstone and shale and are mostly moderately fine textured to fine textured. Moderately deep, nearly level to steep Hapludults (Hartsells, Linker, and Townley series) are on broad plateaus, ridgetops, mountaintops, or upper side slopes. Deep Hapludults (Enders series) and Fragiudults (Wynnville series) are on some of the more level upland sites. Shallow, gravelly and very gravelly, nearly level to steep Dystrochrepts (Hector and Montevallo series) are on narrow upper valley slopes and ridgetops. Areas of rock outcrop are common on these sites. Deep Hapludults (Albertville series) and Paleudults (Allen series) are on lower side slopes and terraces.[6]

The Sand Mountain MRLA corresponds to the Appalachian Plateau Major Soil Area. The Appalachian Plateau comprises Cumberland, Sand, Lookout, Gunter, Brindlee, Chandler and smaller mountains. Most of the soils are derived from sandstone or shale.

Figure 30:



Source: University of Alabama, Department of Geography. Alabama Maps. http://alabamamaps.ua.edu/alabama/physical/index.html

The more level areas are dominated by Nauvoo, Hartsells and Wynnville soils which were formed in residuum from sandstone. They have loamy subsoils and fine sandy loam surface layers. Most slopes are less than 10 percent. Elevation is about 1,300 feet. Corn, soybeans, potatoes and tomatoes are major crops. Poultry is very important in this area.

The more rugged portions of the Appalachian Plateau are dominated by soils such as Montevallo and Townley, which were formed in residuum from shale. These soils have either a very channery loamy, or a clayey subsoil and silt loam surface layers. Most areas are too steeply sloping for agriculture. Elevations range from 300 to 700 feet.[7]

MRLA 133A–Southern Coastal Plain. Found in Alabama, Florida, Georgia, Mississippi, North Carolina, South Carolina, Tennessee, and Virginia, the Southern Coastal Plain MRLA encompasses approximately 110,060 square miles. This area is about 69 percent woodland, 17 percent cropland, and 11 percent pastureland. About 3 percent of the area is used for rangeland, urban development, or other purposes. The woodland is 65 to 75 percent privately owned and 25 to 35 percent industry owned. A small percentage is federally owned. Timber production is important. Cash crops include soybeans, corn, peanuts, and cotton. Major vegetable crops, melons, tobacco, and pecans are important in some parts. Recently, livestock farming has increased. Pastures are used mostly for beef cattle, but some dairy cattle and hogs are raised. Controlling soil erosion and improving drainage on low wetland areas are major concerns of management.

The dominant soils are Udults. They are deep and have a thermic temperature regime, an udic moisture regime, a loamy or sandy surface layer, and a loamy or clayey subsoil. Well drained and moderately well drained, nearly level to strongly sloping Paleudults and Kandiudults (Bama, Dothan, Malbis, Norfolk, Orangeburg, Red Bay and Ruston series) are on uplands. Well drained, gently sloping to steep Hapludults and Kanhapludults (Cowarts, Smithdale, Springhill, Luverne, Saffell, and Sweatman in the south and Suffolk, Emporia, Rumford, Kenansville, and Craven in the north) are on uplands. Associated with these soils in less sloping areas are the moderately well drained and somewhat poorly drained, loamy Fragiudults (Ora, Bourne, Pheba, and Savannah series), Fragiudalfs (Dulac and Providence series), Paleudults (Izagora, Clarendon, and Goldsboro series) and the well drained to moderately well drained, clayey Paleudults and Kandiudults (Faceville, Greenville, Marlboro, and Shubuta series). Other well drained and somewhat excessively drained, nearly level to steep Paleudults and Kandiudults (Darco, Fuquay, Lucy, Troup, and Wagram series), which have a thick sandy surface layer, are on uplands. Less extensive but locally important soils are the nearly level to moderately steep Quartzipsamments (Alaga, Kershaw, and Lakeland series) on uplands (mostly in the south), Paleudalfs (Atwood, Boswell, Millwood, and Susquehanna series) and Glossaqualfs (Caddo, Guyton, Mollville, Waller, and Wrightsville series) (in the southwest), Paleudalfs (Lexington series) on some loess-capped hilltops in the north-central part of the area, and nearly level Endoaquults (Amy, Myatt, Rembert, and Weston series), Ablauts (Chantey and Leaf series), and Paleaquults (Byars, Coxville, Pantego, and Plummer series) on low wetland. Floodplain soils include Udifluvents (Collins, Iuka, and Ochlockonee series), Fluvaquents (Bibb, Kinston, Mantachie, and Waverly series), and Dystrochrepts (Chenneby, Ouachita, and Riverview series).[6]

The Southern Coastal Plain MRLA corresponds to the Coastal Plains Major Soil Area in Alabama. Most of the soils in this area are derived from marine and fluvial sediments eroded from the Appalachian and Piedmont plateaus. The area consists of the Upper and Lower Coastal Plains. Smithdale, Luverne and Savannah soils are extensive in the Upper Coastal Plains. They have either loamy or clayey subsoils and sandy loam or loam surface layers. Savannah soils have fragipans. Topography is level to very steep. Narrow ridgetops and broad terraces are cultivated, but most of the area is in forest. Elevations range from 200 to 1,000 feet.

Dothan and Orangeburg soils are very extensive in the eastern part of the Lower Coastal Plains. They have loamy subsoils and sandy loam or loamy sand surface layers. Smithdale and Troup soils are very extensive in the western part. These soils have loamy subsoils and loamy sand or sand surface layers. Most slopes are less than 10 percent. Major crops are corn, peanuts, soybeans and horticultural crops. Timber products and hogs are very important. Elevations range from sea level to 500 feet.[7]

MRLA 136–Southern Piedmont. Found in Alabama, Georgia, North Carolina, South Carolina, and Virginia, the Southern Piedmont MRLA encompasses approximately 62,330 square miles. Most of this area is in small farms, but a sizable acreage is controlled by woodland companies. Land adjacent to major cities is used for residences and associated urban development. Although most of the land was once cultivated, much has reverted to mixed stands of pine and hardwoods. Most of the open land is pasture, but some crops, such as soybeans, small grain, corn, cotton, wheat, and, to a lesser extent, tobacco, are grown. Dairy cattle and poultry are important locally.

The dominant soils are Udults. They have a clayey or loamy subsoil, a thermic temperature regime, a udic moisture regime, and kaolinitic or mixed mineralogy. Well drained very gently sloping to gently sloping Kanhapludults (Cecil, Madison, and Appling series) and Kandiudults (Davidson series) are on uplands. Well drained Kanhapludults, Dystrochrepts and Hapludalfs (Pacolet, Cecil, Gwinnett, Louisa, Louisburg, and Wilkes series) are on the steeper slopes. In some localities, these soils contain coarse fragments. Dystrochrepts (Chewacla series) Udifluvents (Congaree and Cartecay series), and Fluvaquents (Wehadkee series) are in alluvial deposits.[6]

The Southern Piedmont MRLA corresponds to the Piedmont Plateau Major Soil Area. Most of the soils in this area are derived from granite, hornblende, and mica schists. Madison, Pacolet and Cecil soils, which have red clayey subsoils and sandy loam and clay loam surface layers, are very extensive. Elevations in most areas range from 700 to 1,000 feet, although in the Talladega Hills, elevations range from 900 to 2,407 feet (highest point in Alabama). Topography is rolling to steep. Most rolling areas were once cultivated but are now in pasture or forest.[7]

Soil Associations. Soil associations, or soil bodies, represent areas that have similarity in kinds of soils, topography, geology, and, in many instances, land use. The soil associations are named in terms of the dominant kinds of soils (soil series) included in their boundaries. The soils associations are grouped within one of the seven physiographic provinces discussed in the topography and geology sections. There are 12 soil associations found in the Lower Coosa River Basin, which are listed in Figure 31 in relation to the county and physiographic where they are located. Figure 32 provides information on the general characteristics of each of the soil associations.[8]

Figure 31:

Soil Associations in the Lower Coosa River Basin

County	Physiographic Province				
	Valley and Ridgelands	Appalachian Plateau	Piedmont Plateau	Coastal Plains	Major Flood Plains and Terraces
Shelby	Decatur-Dewey-Allen	Montevallo-Townley-Enders			
	Minvale-Bodine-Fullerton				
Talladega	Cheaha-Leesburg	Montevallo-Townley-Enders	Tallapoosa-Tatum		
	Decatur-Dewey-Allen				
	Minvale-Bodine-Fullerton				
Clay	Cheaha-Leesburg		Tallapoosa-Tatum		
Chilton			Tallapoosa-Tatum	Savannah-Ruston-Stough	
				Smithdale-Troup-Lucedale-Luverne	
Coosa			Cecil-Grover-Madison		
			Tallapoosa-Tatum		
Autauga				Smithdale-Troup-Lucedale-Luverne	
Elmore			Cecil-Grover-Madison	Dothan-Fuquay-Wagram	Cahaba-Chewacla-Myatt
			Tallapoosa-Tatum	Lucedale-Bama	
				Smithdale-Troup-Lucedale-Luverne	
				Troup-Luverne-Dothan-Orangeburg	

Source: Environmental Data Inventory State of Alabama. U.S. Army Corps of Engineers, Mobile District and the State of Alabama Office of State Planning and Federal Programs, State Planning Division. January 1, 1981. Pages 53-55.

Figure 32:

General Characteristics of Soil Associations in the Lower Coosa River Basin

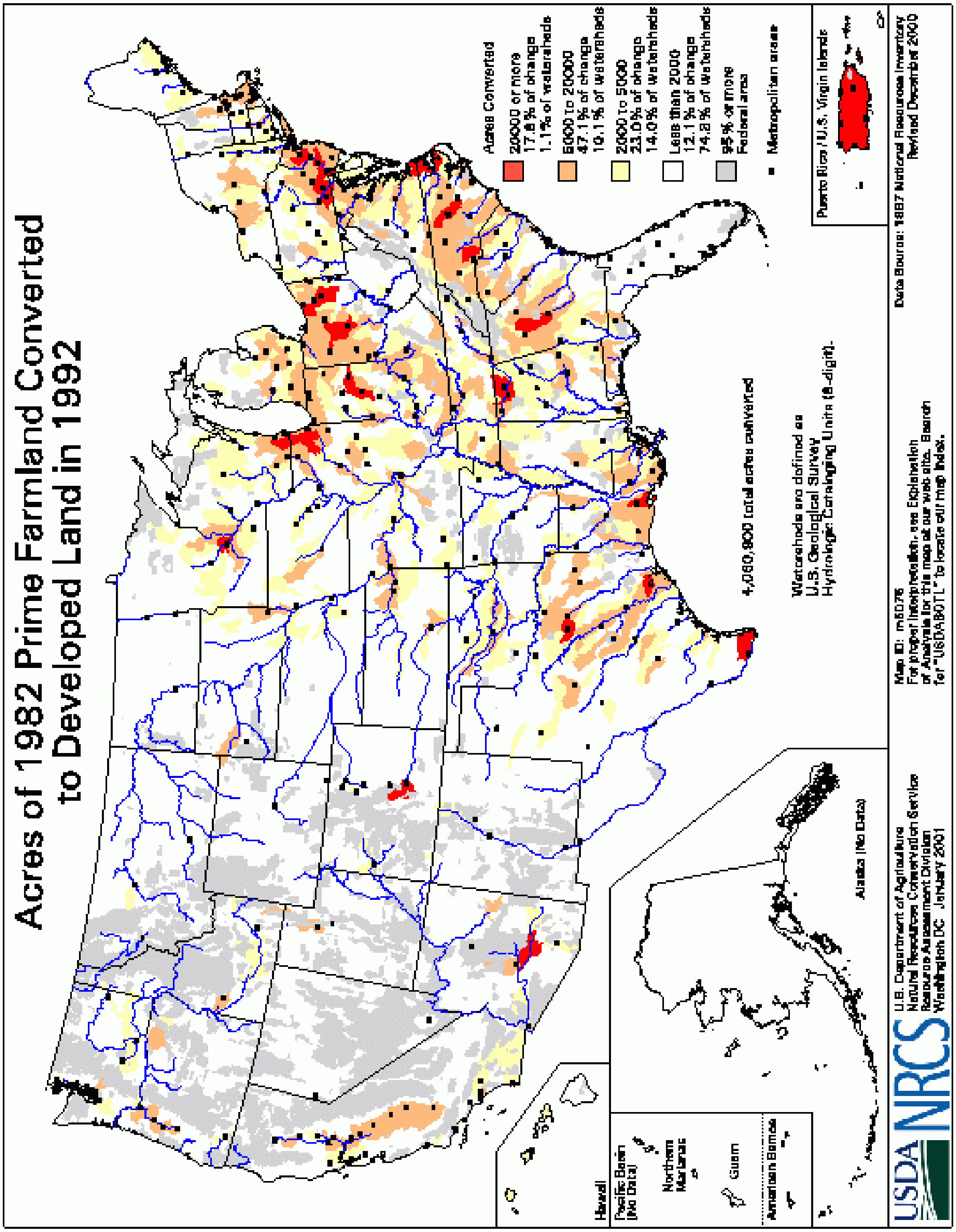
#	Association	Slope and Landscape	Soil Series	Depth	Bedrock	Drainage	Surface Texture
2	Cheaha-Leesburg	Very steep, wooded mountainous uplands – trees are mostly Eastern Red Cedar and Mixed Hardwood	Cheaha	Moderately Deep	Hard Sandstone	Well Drained	Stony, loamy
			Leesburg	Deep	----	Well Drained	Gravelly, loamy
6	Decatur-Dewey-Allen	Nearly level to gently sloping cultivated fields and pastures joined by steep wooded slopes	Decatur	Deep	----	Well Drained	Loamy
			Dewey	Deep	----	Well Drained	Loamy
			Allen	Deep	----	Well Drained	Loamy
10	Minvale-Bodine-Fullerton	Rolling pastureland along steep woodland	Minvale	Deep	----	Well Drained	Cherty, loamy
			Bodine	Deep	----	Excessively Drained	Cherty, loamy
			Fullerton	Deep	----	Well Drained	Cherty, loamy
16	Montevallo-Townley-Enders	Steep and very steep wooded mountainous slopes with Virginia Pine being dominant	Montevallo	Shallow	Shale	Well Drained	Shaly, loamy
			Townley	Mod. Deep	Shale	Well Drained	Loamy
			Enders	Deep	----	Well Drained	Gravelly, loamy
18	Cecil-Grover-Madison	Hilly woodlands of mixed pines and hardwoods	Cecil	Deep	----	Well Drained	Loamy
			Grover	Deep	----	Well Drained	Loamy
			Madison	Mod. Deep	Mica Schist	Well Drained	Loamy
25	Tallapoosa-Tatum	Steep and very steep, mixed hardwood and pine woodlands	Tallapoosa	Shallow	Mica Schist	Well Drained	Loamy
			Tatum	Deep	-----	Well Drained	Loamy
30	Dothan-Fuquay-Wagram	Nearly level to sloping pine woodlands, plus large open areas used for pastures and some cultivated fields on the really level slopes	Dothan	Deep	-----	Well Drained	Loamy
			Fuquay	Deep	-----	Well Drained	Sandy
			Wagram	Deep	-----	Well Drained	Sandy
39	Lucedale-Bama	Nearly level cultivated fields and pastureland with some areas of pine woodland	Lucedale	Deep	-----	Well Drained	Loamy
			Bama	Deep	-----	Well Drained	Loamy
41	Savannah-Ruston-Stough	Nearly level cultivated fields	Savannah	Deep, with Fragipans about 28"	----	Moderately Well Drained	Loamy
			Ruston	Deep	----	Well Drained	Loamy
			Stough	Deep	----	Excessively Drained	Loamy
44	Smithdale-Troup-Lucedale-Luverne	Rolling to hilly woodlands that are dominated by pine	Smithdale	Deep	----	Well Drained	Loamy
			Troup	Deep	----	Well Drained	Sandy
			Lucedale	Deep	----	Well Drained	Loamy
			Luverne	Mod. Deep	----	Well Drained	Loamy
47	Troup-Luverne-Dothan-Orangeburg	Narrow ridge tops and moderately steep side slopes with pine trees being the dominant vegetation, scattered open areas – level ones are cultivated	Troup	Deep	----	Well Drained	Sandy
			Luverne	Mod. Deep	----	Well Drained	Loamy
			Dothan	Deep	----	Well Drained	Loamy
			Orangeburg	Deep	----	Well Drained	Loamy
53	Cahaba-Chewacla-Myatt	Level and nearly level cultivated fields and bottomland, hardwood Woods along streams	Cahaba	Deep	----	Well Drained	Loamy
			Chewacla	Deep	----	Poorly Drained	Loamy
			Myatt	Deep	----	Poorly Drained	Loamy

Source: Environmental Data Inventory State of Alabama. U.S. Army Corps of Engineers, Mobile District and the State of Alabama Office of State Planning and Federal Programs, State Planning Division. January 1, 1981. Pages 53-55.

Prime Farmland. Only a small portion of the Lower Coosa River Basin is considered to be prime farmland, which is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is also available for these uses. It has the soil quality, growing season, and moisture supply needed to produce economically sustained high yields of crops when treated and managed according to acceptable farming methods, including water management. In general, prime farmlands have an adequate and dependable water supply from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, acceptable salt and sodium content, and few or no rocks. They are permeable to water and air. Prime farmlands are not excessively erodible or saturated with water for a long period of time, and they either do not flood frequently or are protected from flooding.[8]

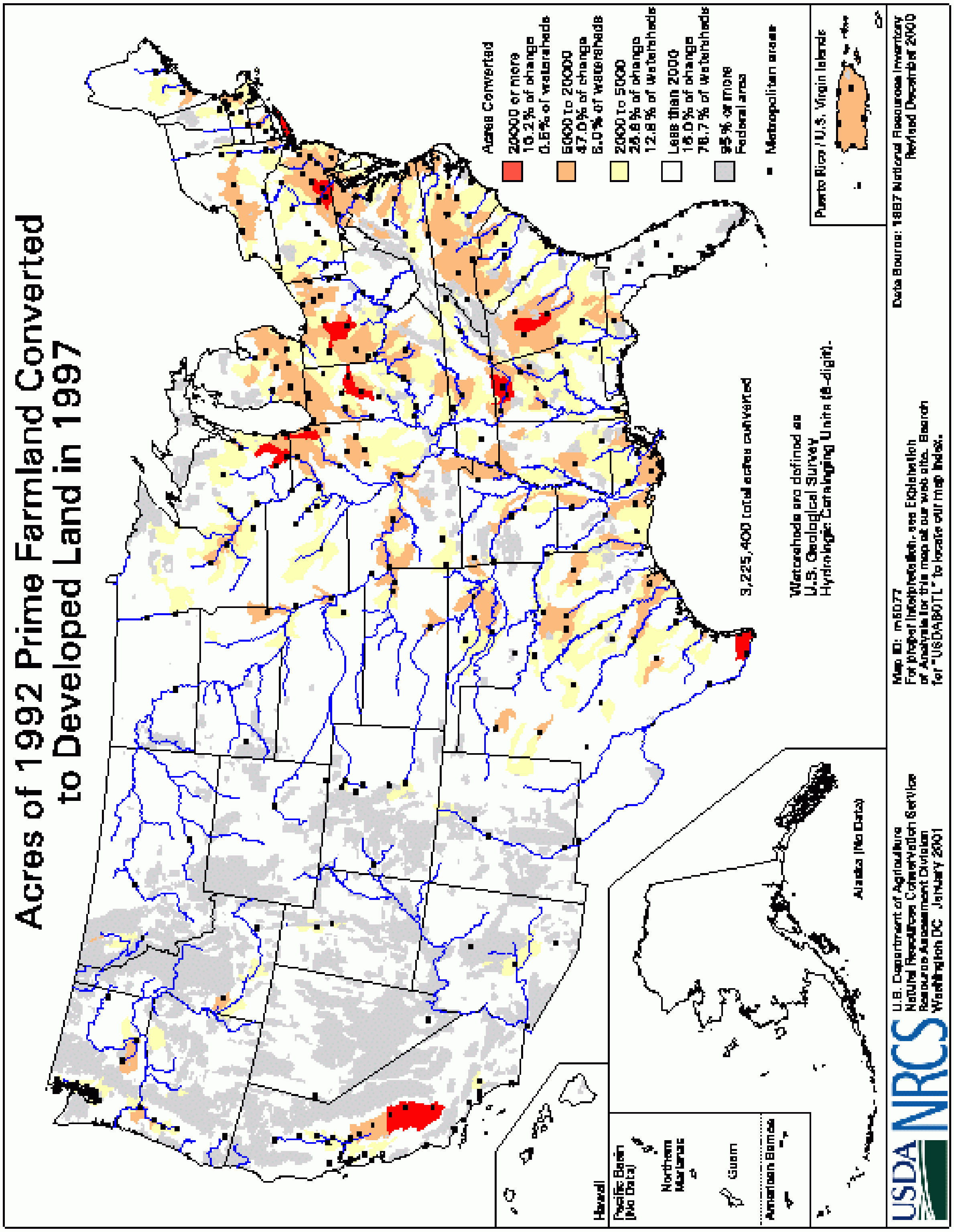
Prime farmland is found in the southern half of Elmore County, through central Chilton County roughly following Interstate-65, and following the Coosa River in Shelby and Talladega Counties. As with the State of Alabama, considerable prime farmland has been lost to development in the Lower Coosa River Basin in the last 20 years. According to data available from the Natural Resource and Conservation Service, approximately 14 percent of the nonfederal rural land that was considered prime farmland in the Lower Coosa River Basin in 1982 had been converted to developed land in 1992; and, between 1992 and 1997, another 12.8 percent of the prime farmland in the basin had been converted to developed land, representing a total loss of more than a quarter of the total prime farmland in the basin in a 15-year period. Likewise, Alabama ranked 10th in the nation in the average annual loss of prime farmland to development between 1992 and 1997.[9]

Figure 33:



Source: USDA Natural Resource and Conservation Service, Technical Resources. August 2004. Http://www.nrcs.usda.gov/technical/land/meta/m4983.html

Figure 34:



Source: USDA Natural Resource and Conservation Service, Technical Resources. August 2004. Http://www.nrcs.usda.gov/technical/land/meta/m4983.html

Hydrologic System

The Coosa River is, by far, the predominant hydrologic feature of the Lower Coosa River Basin. The river, however, is accented by the development of three recreational impoundments for hydropower use: Lay Lake, Lake Mitchell and Lake Jordan. The hydrologic system within the Lower Coosa River Basin is comprised of numerous streams, creeks, gullies and wetlands feeding into the major streams of the 20 watersheds that form the basin, of which 23 have been classified for specific water uses. One is classified for agricultural and industrial water supply; nine are classified for fish and wildlife; three are classified for swimming and other whole body water-contact sports and fish and wildlife; and, five are classified for public water supply, swimming and other whole body water-contact sports, and fish and wildlife. The remaining four streams are classified as Outstanding Alabama Waterways, of which two are classified for use as fish and wildlife, one is for swimming and fish and wildlife, and one is for public water supply and fish and wildlife. Two stream segments have also been listed as a National Outstanding Water Resource by the National Park Service. Those streams which are not classified by name are generally considered to be acceptable for a "Fish and Wildlife" classification. Water use classification within the Lower Coosa River Basin is discussed in detail in Part II of this plan.

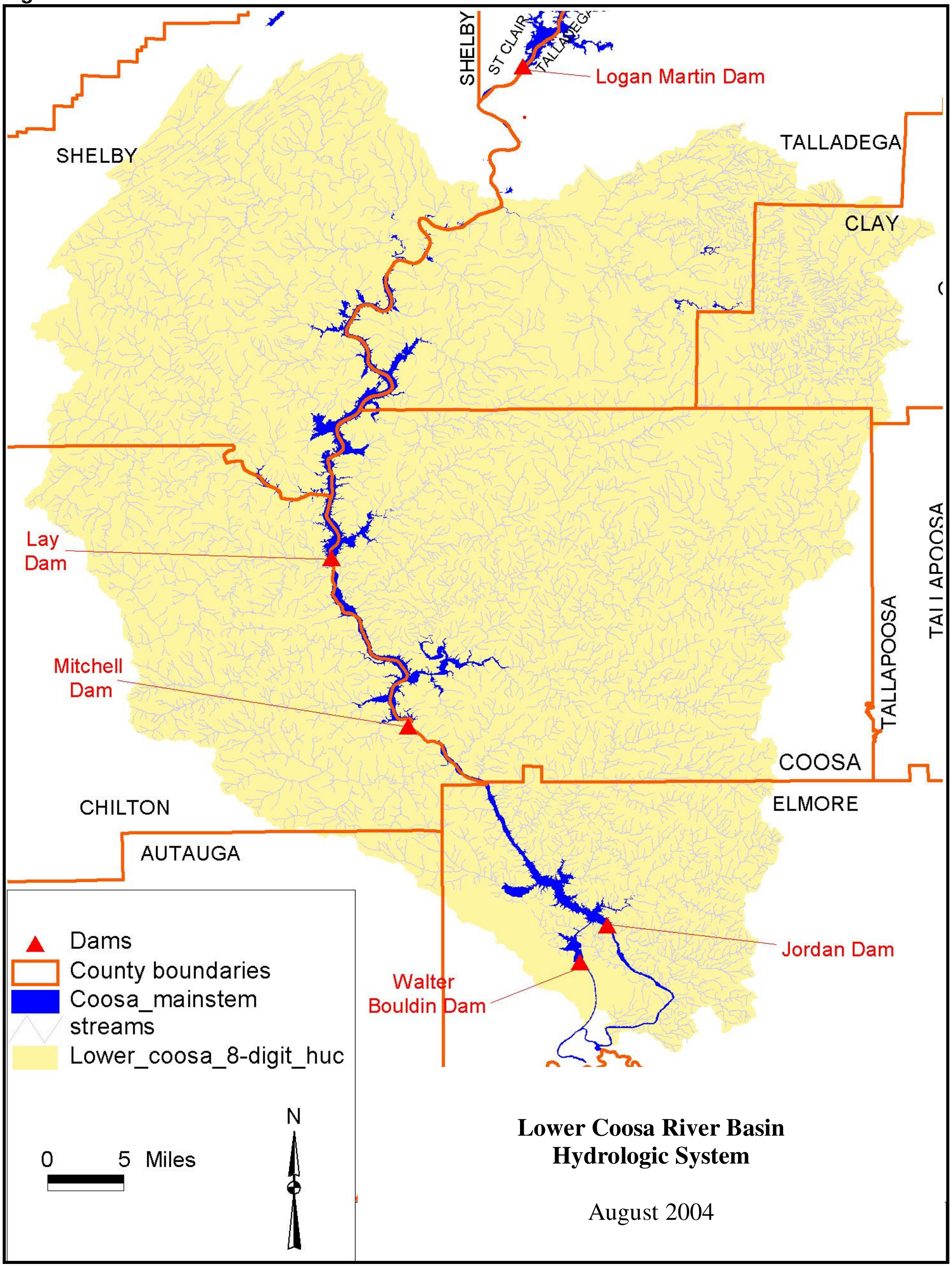
As stated previously, there are 20 watersheds within the Lower Coosa River Basin. Of the 20 watersheds, there are areas that primarily influence the Coosa River; there are watersheds with primary tributaries supported by a local stream network; and finally, there are watersheds that are interconnected as a system that must be viewed as a unit rather than only as watersheds.

Some of the watersheds are small and have low-order streams flowing directly into the Coosa River. For example, the Walthall Branch (020) watershed has a long dimension of the watershed that is coincident with the bank of the Coosa River. There is both sheetflow and low-order streams that flow directly into the Coosa River in addition to the outflow from Walthall Branch.

Larger watersheds, such as Walnut Creek (160), have some smaller areas that drain directly to the Coosa River. However, the dominant portion of the larger watershed is drained by stream networks flowing to tributaries, such as Walnut Creek, which is the primary tributary discharging into the Coosa River.

A limited number of the watersheds form larger tributary watersheds because one watershed discharges into or flows through another watershed. The Buxahatchee Creek watershed (090) drains into the Waxahatchee Creek watershed (100) and then discharges into the Coosa River. The Socapatoy Creek watershed (120) and the three parts of Hatchet Creek - Upper (110), Middle (130) and Lower (150) flow into or through other areas before discharging into the Coosa River. Prior to the impoundment of Lake Mitchell, the Weogufka watershed (140) also discharged through the Lower Hatchet Creek watershed, but now flows directly into the Coosa River.

Figure 35:



Source: Alabama Department of Environmental Management. August 2004.

Wetlands. Wetlands are those areas where the water table is at, near, or above the land surface for a significant part of the year. The two subclassifications of wetlands are forested and nonforested wetlands. The hydrologic regime is such that aquatic vegetation usually is established, although alluvial and tidal flats may be nonvegetated. Wetlands frequently are associated with topographic lows, even in mountainous regions. Wetlands include wet meadows or perched bogs in high mountain valleys and seasonally wet or flooded basins, playas, or potholes with no surface water outflow. Shallow water areas where aquatic vegetation is submerged are classed as open water and are not included in most wetland categories. Extensive parts of some river floodplains qualify as wetlands, as do regularly flooded irrigation overflow areas. These do not, however, include agricultural land where seasonal wetness or short-term flooding may provide an important component of the total annual soil moisture necessary for crop production. Areas in which soil wetness or flooding is so short-lived that no typical wetlands vegetation is developed belong in other categories. [8]

Review of numerous land use, land cover and other maps revealed that little to no wetlands areas (by definition) exist in the Lower Coosa River Basin.

Source Documents

1. Alabama Water Commission. Water Quality Management Plan – Coosa River Basin. July 1976.

2. Earnest A. Mancini, State Geologist and Oil and Gas Supervisor. *Geologic Map of Alabama.* Geologic Survey of Alabama. Special Map 220. 1988.

3. *The Mineral Industry of Alabama.* USGS. Minerals Yearbook 2003. http://minerals.er.usgs.gov/minerals/pubs/state/al.html

4. *Environmental Data Inventory State of Alabama.* U.S. Army Corps of Engineers, Mobile District and the State of Alabama Office of State Planning and Federal Programs, State Planning Division. January 1, 1981.

5. Natural Resource and Conservation Service. Major Land Resource Areas, Definitions. http://soils.usda.gov/survey/geography/mlra/mlra_definitions.html

6. Natural Resource and Conservation Service. Major Land Resources Areas in Alabama. http://www.mo15.nrcs.usda.gov/technical/mlra_al.html

7. Mitchell, Jr., Charles C., Agronomist-Soils, and Meetze, John C., State Soil Scientist, USDS-SCS. *Soils of Alabama.* Alabama Cooperative Extension System, Circular ANR-340 (July 1990). http://www.aces.edu/department/grain/ANR340.htm

8. *Environmental Data Inventory State of Alabama.* U.S. Army Corps of Engineers, Mobile District and the State of Alabama Office of State Planning and Federal Programs, State Planning Division. January 1, 1981.

9. USDA Natural Resource and Conservation Service. Technical Resources. http://www.nrcs.usda.gov/technical/land/meta/m4983.html

Chapter 3
Demographics

Demographic information presented in this chapter was collected and compiled using data from the U.S. Bureau of Census, except as noted or referenced. For the detailed 2000 information, data was collected at the block group level and then combined to derive data for each watershed. The basin information is simply a compilation of the 20 individual watersheds. Because census block groups do not always follow the watershed boundaries, it was necessary to sometimes make judgments on the amount of land area that is located within a watershed. The population of the block group was then divided proportionately among the watersheds based on geographical areas. While this method of estimating population is not 100 percent accurate because of the variance in population density among census block groups and watersheds, it does provide a reasonable estimate of population along with the level of information detail necessary to establish an overall demographic profile of the Lower Coosa River Basin. Information presented in this chapter is for the entire Lower Coosa River Basin, with some comparisons between watersheds. Detailed data for each of the 20 watersheds located within the basin can be found in the *Atlas of Watersheds*.

Figure 36:

County Population, 2000

County	2000 Population	Population Density	
		Per Square Mile	Per Acre
Autauga County	43,671	73.3	0.115
Chilton County	39,593	57.1	0.089
Clay County	14,254	23.6	0.037
Coosa County	12,202	18.7	0.029
Elmore County	65,874	106.0	0.414
Shelby County	143,293	180.3	0.282
Talladega County	80,321	108.6	0.170

Source: U.S. Bureau of Census, 2000

There are 21 governmental jurisdictions located with the Lower Coosa River Basin, including portions of seven counties and portions or all of 14 municipalities. The seven counties are Autauga, Chilton, Clay, Coosa, Elmore, Shelby and Talladega. The 14 municipalities are Calera, Chelsea, Childersburg, Clanton, Columbiana, Goodwater, Harpersville, Jemison, Pelham, Rockford, Sylacauga, Thorsby, Wetumpka, and Wilsonville. The following jurisdictional information helps to understand the population base from which the Lower Coosa River Basin is derived. The total population of the seven counties is 399,208 persons as of the 2000 Census. Population within the counties ranges from 12,202 in Coosa County to 143,293 in Shelby County. Of the total population of the seven counties, 16 percent (64,161 persons) are located within the boundaries of one of the incorporated municipalities.

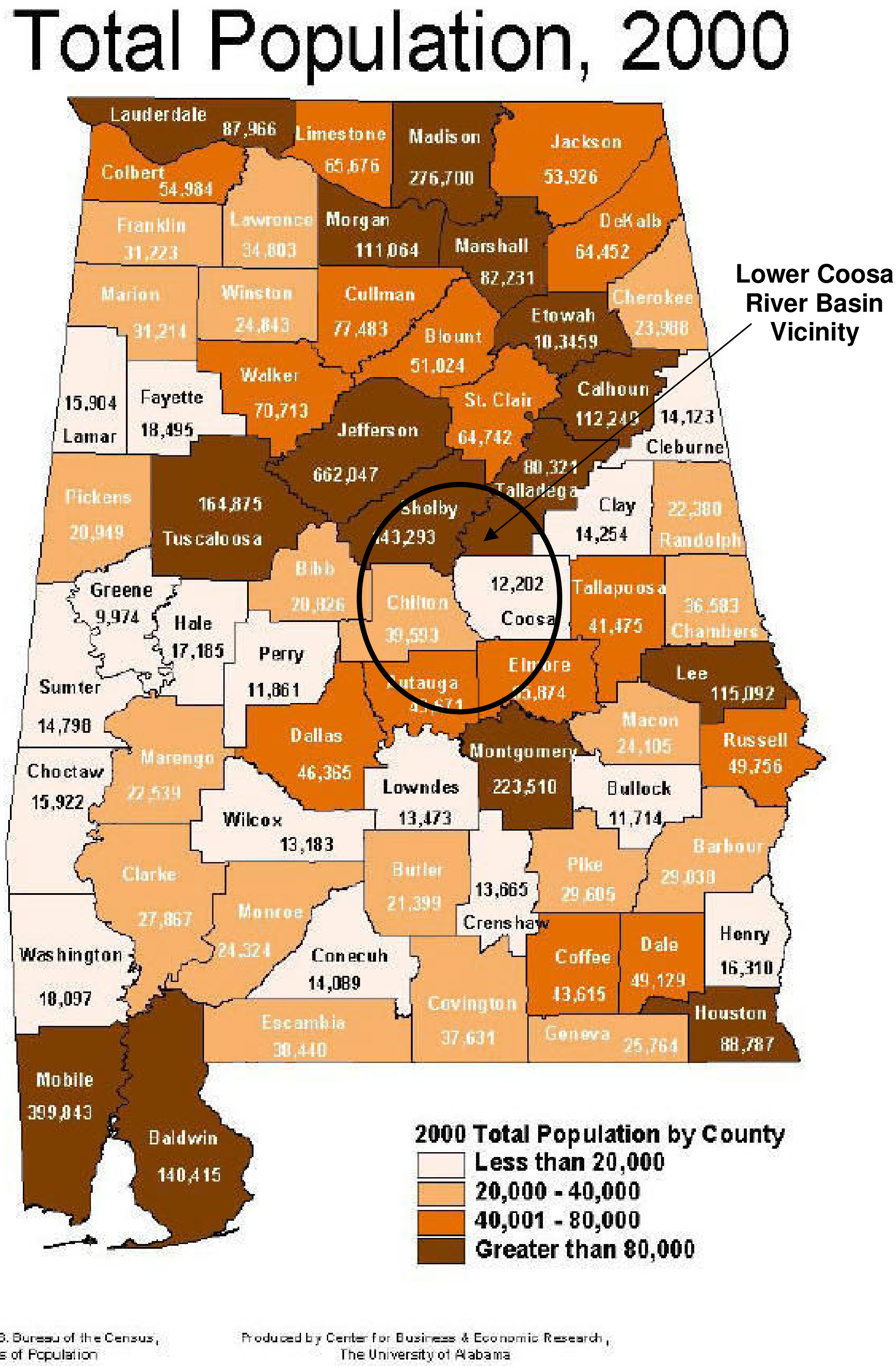
Figure 37:

Municipal Population, 2000					
Municipality	**2000 Population**	**Density Per Square Mile of Land Area**	**Municipality**	**2000 Population**	**Density Per Square Mile of Land Area**
Calera	3,158	244.9	Jemison	2,248	279.6
Chelsea	2,949	293.6	Pelham	14,369	378.2
Childersburg	4,927	637.2	Rockford	428	129.6
Clanton	7,800	383.8	Sylacauga	12,616	681.0
Columbiana	3,316	218.5	Thorsby	1,820	355.5
Goodwater	1,633	249.6	Wetumpka	5,726	672.9
Harpersville	1,620	102.0	Wilsonville	1,551	157.5
Source: U.S. Bureau of Census, 2000					

Lying between Birmingham and Montgomery, the Lower Coosa River Basin is adjacent to two heavily populated areas that have seen significant population growth in the last 20 years. With its regional location, the Lower Coosa River Basin is home to many commuting workers. The total population map of the State of Alabama (Figure 38) shows Shelby and Talladega Counties as two of 15 counties in the state with a population over 80,000 and Autauga and Elmore Counties as two of 15 counties with a population between 40,001 and 80,000. Only Clay and Coosa Counties are a part of the total 17 counties that have a population of less than 20,000.

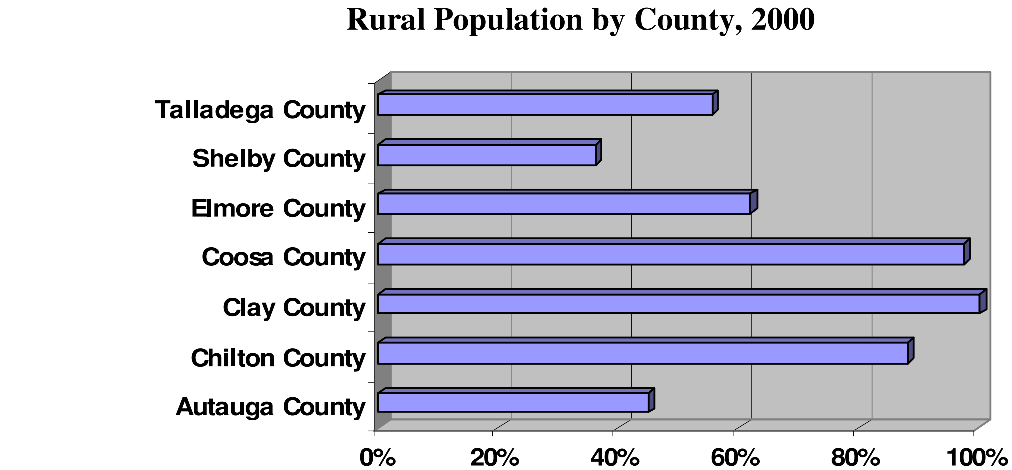
Of the total 2000 population of the seven counties, just under half, 45.48 percent, live in urban areas with the majority of the population, at 54.52 percent living in rural areas. In Clay County, 100 percent of the population is rural and in Coosa County 97.40 percent of the population is rural. In contrast, in Shelby County only 36.10 percent of the population is rural. The combined racial composition of the seven counties is 81.40 percent white, 17.08 percent black and 1.52 percent of another race, with the largest percentage being Asian, at .55 percent. Median age for both males and females in the counties ranges from 35 in Autauga, Elmore and Shelby Counties to 39 in Clay County. In all of the counties, the median age for females is two to five years older than the median age for males. Within the seven counties, there are a total of 149,779 households. The average household size ranges from 2.43 in Clay County to 2.71 in Autauga County. Average family size is slightly larger, ranging from 2.93 in Clay County to 3.12 in Autauga County. There are a total of 111,267 families within the counties with 84.59 percent of the total population living in families.

Figure 38:



Source: Center for Business and Economic Research, University of Alabama.

Figure 39:



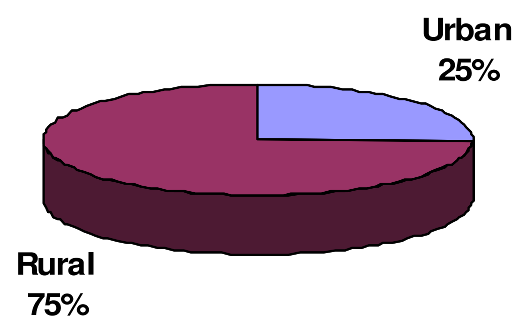
Source: U.S. Bureau of Census, 2000. Summary File 1

Population

The population of the Lower Coosa River Basin, at 109,710 persons, is just over one-of the total population of the seven counties that make up the basin. Of the total basin population, only 25.45 percent is urban and 74.55 percent is rural, in comparison to a rural population of 54.52 percent for the counties combined. The largest part of the basin's rural population is nonfarm, at 97.93 percent.

Figure 40:

2000 Rural Population of the Lower Coosa River Basin



Half of the 20 watersheds in the basin have less than 1.00 percent urban population with six of those having no urban population at all. Those watersheds with a population that is more than 50 percent urban include Tallaseehatchee Creek at 60.58 percent, Kahatchee Creek at 60.58 percent, and Pigeon Roost Creek at 65.22 percent. The geographic area of these three urban watersheds is only 12.47 percent of the basin area.

The racial composition of the population of the basin overall is primarily white, at 79.31 percent, with blacks comprising 18.82 percent. Other populations comprise less than 1.00 percent of the population each with American Indian / Alaskan Native at 0.41 percent, Asian at 0.25 percent, Native Hawaiian at 0.01 percent and some other race at 0.38 percent. Persons of two or more races comprise 0.82 percent of the total population of the basin.

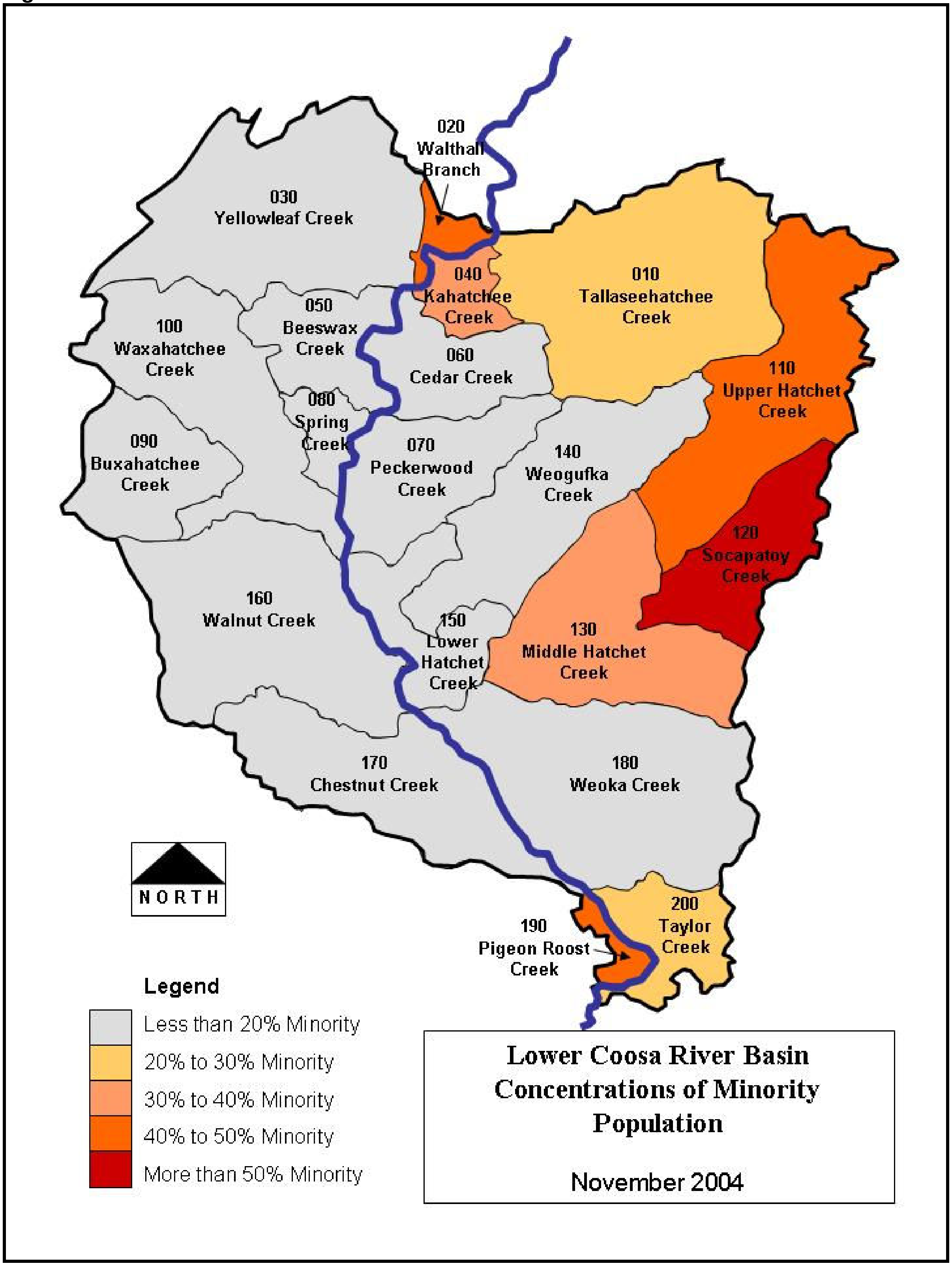
Figure 41:

Racial Composition of Lower Coosa River Basin and Watersheds, 2000				
HUC	**Watershed**	**% White**	**% Black**	**% Other**
010	Tallaseehatchee Creek	71.29	27.22	1.49
020	Walthall Branch	59.65	40.23	0.12
030	Yellowleaf Creek	95.73	2.57	1.70
040	Kahatachee Creek	62.87	35.71	1.42
050	Beeswax Creek	93.62	4.72	1.66
060	Cedar Creek	87.52	11.32	1.16
070	Peckerwood Creek	92.39	5.55	2.06
080	Spring Creek	95.26	4.07	0.67
090	Buxahatchee Creek	87.21	9.29	3.50
100	Waxahatchee Creek	83.11	14.23	2.66
110	Upper Hatchet Creek	54.68	43.70	1.62
120	Socapatoy Creek	47.27	51.98	0.75
130	Middle Hatchet Creek	70.26	28.07	2.42
140	Weogufka Creek	84.53	14.68	0.79
150	Lower Hatchet Creek	87.85	10.49	1.66
160	Walnut Creek	83.15	14.33	2.52
170	Chestnut Creek	85.44	12.88	1.68
180	Weoka Creek	81.71	16.12	2.17
190	Pigeon Roost Creek	56.12	41.20	2.68
200	Taylor Creek	70.08	26.84	3.08
	Lower Coosa River Basin	79.31	18.82	1.87
Source: U.S. Bureau of the Census, 2000 and Delaney Consultant Services, Inc.				

The percentages of the black and white population in the Lower Coosa River Basin, overall, are not necessarily reflective of the racial composition of each of the watersheds. While the majority of the basin population is either white or black, some of the watersheds have a significantly higher proportion of white or black population than others. All of the watersheds have less than 4.00 percent population of races other than black or white, with the highest percentage found in the Buxahatchee Creek watershed, at 3.50 percent. Most of the watersheds have a majority white population. Only one watershed has a majority black population, which is the Socapatoy Creek watershed at 51.98 percent. Other watersheds with a significant black population (higher than the overall basin percentage of 18.82 percent) include Tallaseehatchee Creek at 27.22 percent, Yellowleaf Creek at 40.23 percent, Kahatchee Creek at 35.71 percent, Upper Hatchet Creek at 43.70 percent, Middle Hatchet Creek at 28.07 percent, Pigeon Roost Creek at 41.20 percent, and Taylor Creek at 26.84 percent. The concentrations of minority population are found along the northeastern and southern edges of the basin as shown in Figure 42.

Those watersheds with a white population higher than the overall basin percentage of 79.31 percent include Yellowleaf Creek at 95.73 percent, Beeswax Creek at 93.62 percent, Cedar Creek at 87.52 percent, Peckerwood Creek at 92.39 percent, Spring Creek at 95.26 percent, Buxahatchee Creek at 87.21 percent, Waxahatchee Creek at 83.11 percent, Weogufka Creek at 84.53 percent, Lower Hatchet Creek at 87.85 percent, Walnut Creek at 83.15 percent, Chestnut Creek at 85.44 percent, and Weoka Creek at 81.71 percent.

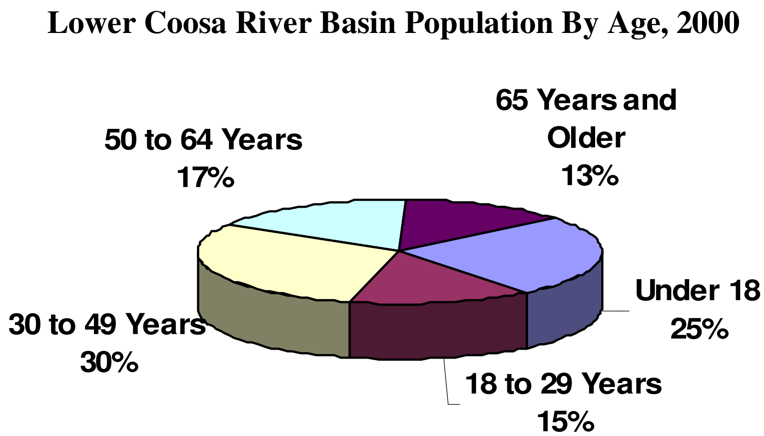
Figure 42:



Source: U.S. Bureau of Census, 2000 and Delaney Consultant Services, Inc.

Of the total basin population, 52 percent are females and 48 percent are males. About one-fourth of the population is under the age of 18 and 13.41 percent is age 65 years and older. These two groups comprise the “at risk” population because of the high number of persons in this group that are dependent upon someone else for care. The general working age population, age 18 to 64, comprises approximately 61.38 percent of the total population of the basin.

Figure 43:



A large majority of the basin population lives in family households, at 86.41 percent, while 11.28 percent live in non-family households. Of the remaining 2.31 percent that live in group quarters rather than in households, 91.98 percent are institutionalized and 8.01 percent are non-institutionalized.

Of the 109,710 persons living in the Lower Coosa River Basin, 99.19 percent are native to the United States and 0.81 percent are foreign born. Of those persons who are foreign born, 48.14 are naturalized citizens and 51.90 are not U.S. citizens. The majority of the native population was born in Alabama (82.47 percent) or elsewhere in the South (10.37 percent). Those persons who were born in other regions of the United States comprise 6.35 percent of the population, with 1.65 percent born in the Northeast, 3.54 percent born in the Midwest, 1.45 percent born in the West and 0.53 percent born overseas.

In general, the population of the Lower Coosa River Basin if fairly stable, with 60.26 percent living in the same house for the last five years when the 2000 Census was taken. Of the 39.74 percent that had changed houses in the five year period prior to the 2000 Census, 21.45 percent lived in the same county and 12.30 percent lived in a different county in Alabama, 5.40 percent lived in another state, and 0.59 percent lived somewhere other than the United States. Of those persons who moved to a location in the Lower Coosa River Basin from another state, 63.09 moved from another state in the South, 16.74 percent moved from the Midwest, 13.65 moved from the West, and 6.52 moved from the Northeast.

Economics

The 1999 per capita income of the Lower Coosa River Basin was $16,881, which is lower than the 1999 per capita income of the State, at $18,189. The 1999 median household and median family incomes of the population of the basin, however, is slightly higher than that of the State. The median household income of the basin is $34,975 as compared to $34,135 for the State; and the median family income of the basin is $41,843, as compared to $41,657 for the State. Poverty status was determined for 97.84 percent of the basin population, of which 14.73 percent were determined to have an income below poverty level in 1999 and 83.11 percent were determined to have an income at or above poverty level in 1999.

The population of the basin that is age 20 and older is 73,135 persons, which is approximately two-thirds of the total basin population. Of the population 25 and older, 1.24 percent have no education and 27.62 percent do not have a high school diploma. Of the remaining 71.14 percent of the population, 35.36 percent have a high school diploma (which includes graduate equivalency), 19.06 percent have some college education, but no degree, 4.39 percent have an associate degree, 12.33 percent have a bachelor's degree or a graduate level degree. Educational attainment of the basin population is reflective of the counties that make up the basin. Only Shelby County has a population in which more than 80 percent have a high school diploma or higher.

Figure 44:

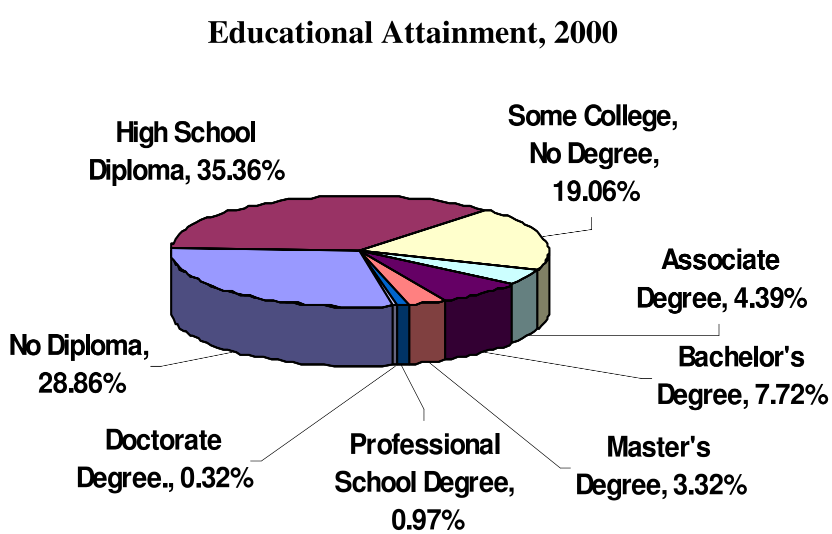
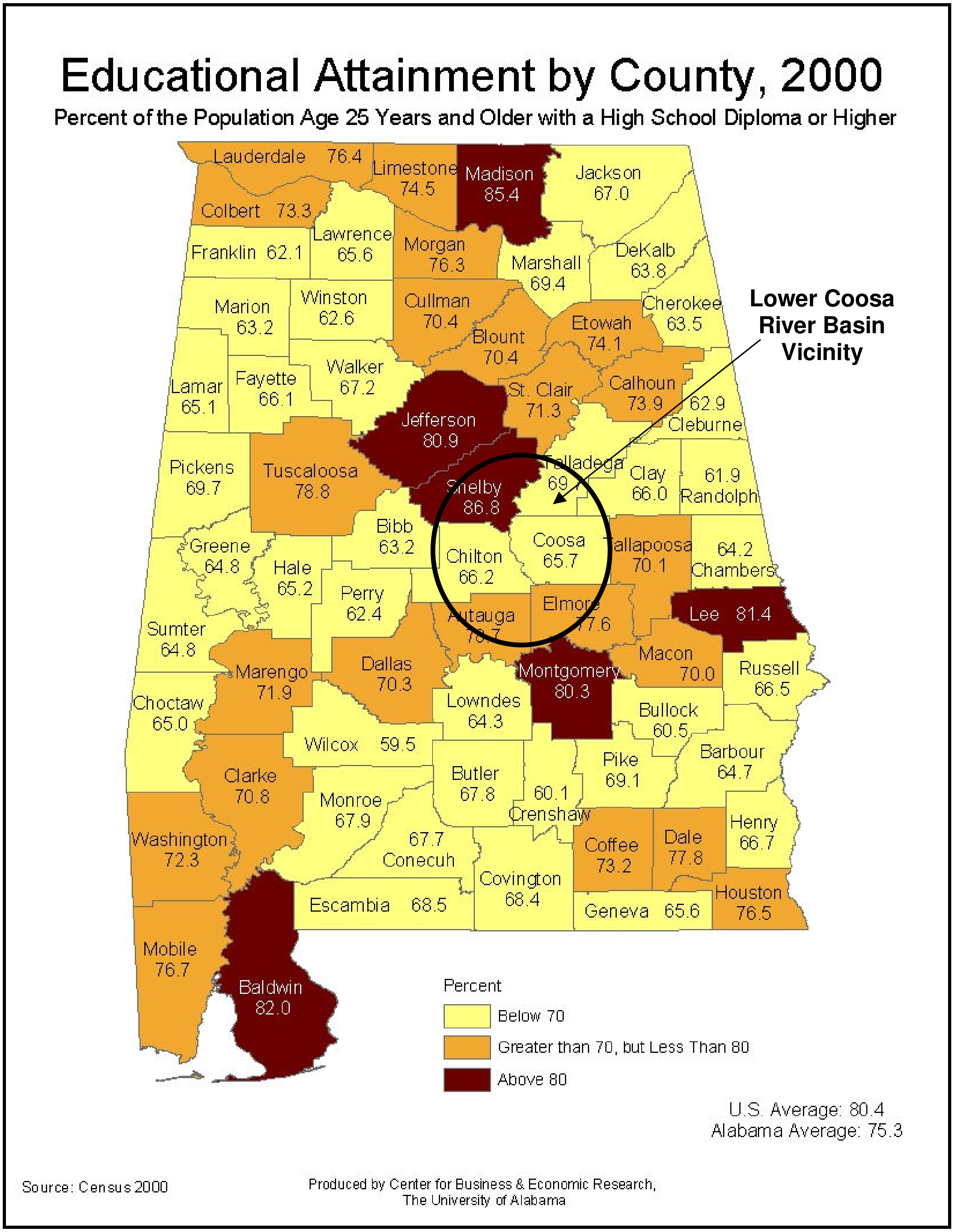


Figure 45:



Source: Center for Business and Economic Research, University of Alabama.

Within the Lower Coosa River Basin, there are 49,873 persons in the labor force, which is 58.50 percent of the population age 16 and over. Of those persons in the labor force, 99.68 are in the civilian labor force and 0.31 percent in the armed forces. Of the civilian labor force, 94.16 are employed and 5.84 percent are unemployed. The unemployment rate in the basin for females is higher, at 6.37 percent, than the unemployment rate for males, at 5.39 percent. In contrast, the overall unemployment rate for the basin is slightly lower than that of the State, at 6.2 percent.

Figure 46:

Unemployment in the Lower Coosa River Basin and Watersheds, 2000

HUC	Watershed	Percent Unemployed
010	Tallaseehatchee Creek	8.04%
020	Walthall Branch	5.80%
030	Yellowleaf Creek	2.78%
040	Kahatachee Creek	9.68%
050	Beeswax Creek	4.89%
060	Cedar Creek	5.32%
070	Peckerwood Creek	6.25%
080	Spring Creek	8.33%
090	Buxahatchee Creek	4.66%
100	Waxahatchee Creek	5.33%
110	Upper Hatchet Creek	8.36%
120	Socapatoy Creek	6.44%
130	Middle Hatchet Creek	5.12%
140	Weogufka Creek	5.95%
150	Lower Hatchet Creek	8.86%
160	Walnut Creek	5.20%
170	Chestnut Creek	5.15%
180	Weoka Creek	3.57%
190	Pigeon Roost Creek	9.35%
200	Taylor Creek	4.12%
	Lower Coosa River Basin	5.84%

Source: U.S. Bureau of the Census, 2000 and Delaney Consultant Services, Inc

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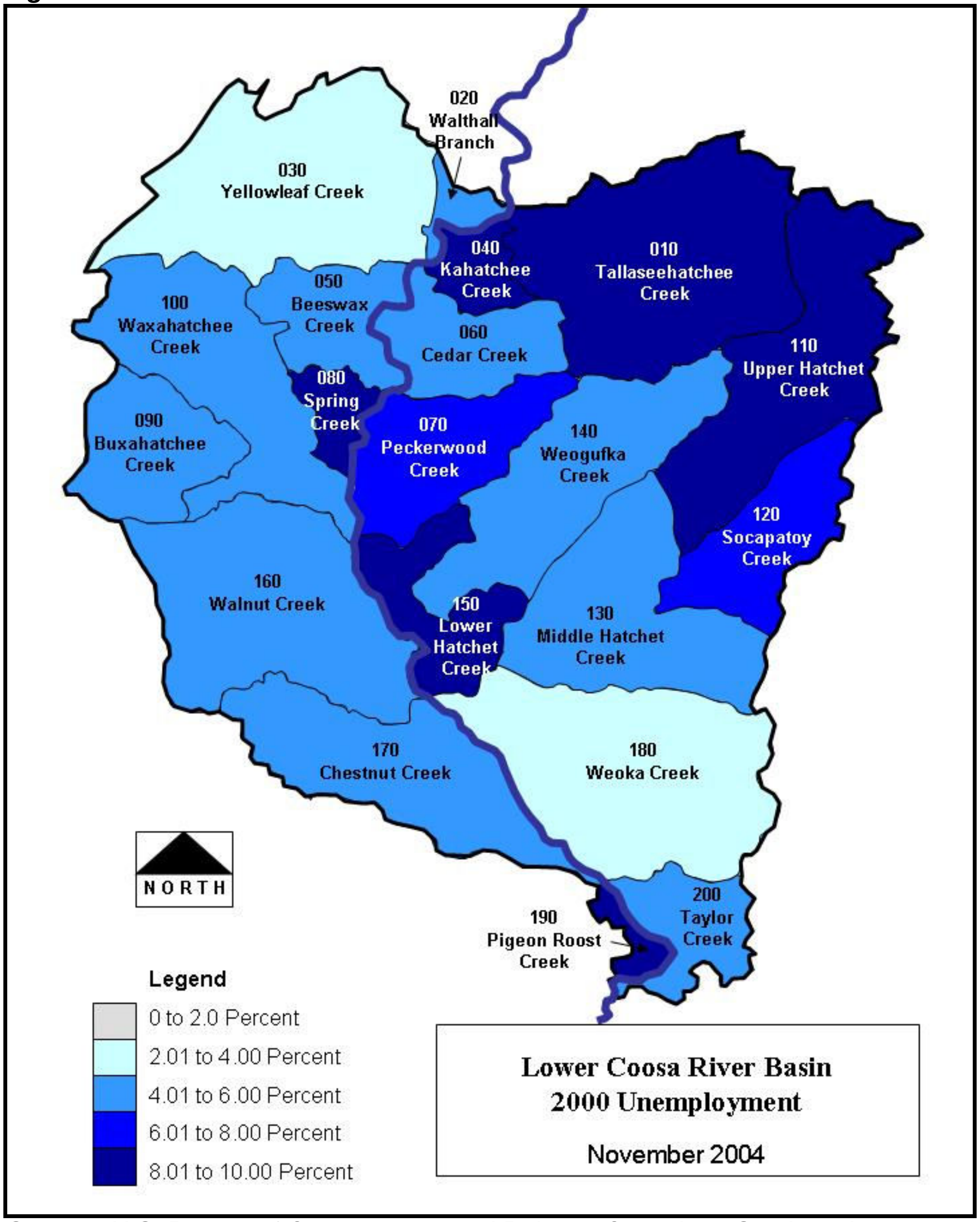
Unemployment is highest in the Kahatchee Creek watershed at 9.68 percent and lowest in the Yellowleaf Creek watershed at 2.78 percent. Other watersheds with an unemployment rate higher than 8.0 percent include Pigeon Roost Creek at 9.35 percent, Lower Hatchet Creek at 8.86 percent, Upper Hatchet Creek at 8.36 percent, Spring Creek at 8.33 percent, and Tallaseehatchee Creek at 8.04 percent. Two additional watersheds have an unemployment rate between 6.01 and 8.00 percent, which is generally considered to be high. Half of the watersheds have an average unemployment rate between 4.01 percent and 6.00 percent, and two watersheds have a low unemployment rate of less 4.0 percent or less. Geographically, neither low nor high unemployment rates are concentrated in one area of the basin as shown in Figure 47.

Figure 47:



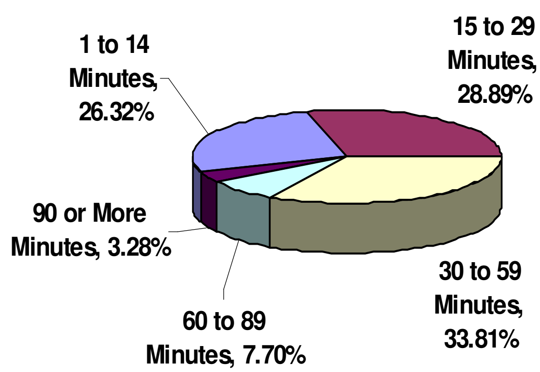
Source: U.S. Bureau of Census, 2000 and Delaney Consultant Services, Inc.

In a comparison of employment within industry segments in the Lower Coosa River Basin and in the State of Alabama, it was shown that manufacturing and education, health and social services are the two largest employment sectors for the labor force of both the basin and the State. Over one-third of the labor force in the basin (36.52 percent) and the State (37.7 percent) are employed in one of these industries. Retail trade follows with employment of more than 10 percent of the labor force at both the basin and state levels. The construction industry also employs more than 10 percent of the labor force at the basin level (10.75 percent), but only 7.6 percent at the State level. The industry segment with the lowest percentage of the labor force in both the Lower Coosa River Basin and the State of Alabama is information, at 2.11 percent and 2.2 percent, respectively.

Figure 48:

Employment by Industry, 2000		
Industry	**Lower Coosa River Basin**	**State of Alabama**
Agriculture; forestry; fishing, hunting; and mining	2.43%	1.9%
Construction	10.75%	7.6%
Manufacturing	20.48%	18.4%
Wholesale trade	3.46%	3.6%
Retail trade	12.02%	12.2%
Transportation and warehousing; and utilities	5.85%	5.3%
Information	2.11%	2.2%
Finance and insurance; and real estate	5.79%	5.8%
Professional; scientific; management; administrative; and waste management	5.43%	7.1%
Educational services; health and social services	16.04%	19.3%
Arts; entertainment; recreation; accommodation; food services	5.60%	6.4%
Other services	5.27%	5.1%
Public administration	4.70%	5.2%
Source: U.S. Bureau of Census, Profile of General Demographic Characteristics: 2000 for the State of Alabama, U.S. Bureau of Census, 2000, Summary Files, and Delaney Consultant Services, Inc.		

Figure 49:
Travel Time To Work, 2000



Of the total workers in the Lower Coosa River Basin, age 16 and over, almost all work in Alabama (99.19 percent), however, only just over half, at 57.44 percent, work inside their county of residence. The great majority of the workers utilize a car, truck or van as their means of transportation to and from work and most, at 86.44 percent, drive alone. Carpooling is utilized by 13.56 percent of the workers and 2.07 percent work at home. Public transportation is only utilized by 0.18 percent of the working population. Lack of proximity to work locations is also evident in commuting times. Almost half of the workers spend more than 14 minutes in getting to or from work, with 28.89 percent traveling for 15 to 29 minutes one way, 33.8 percent traveling for 30 to 59 minutes one way, 10.98 percent having a travel time of one hour or more to get to or from work.

Housing

As of 2000, there are a total of 49,042 housing units in the Lower Coosa River Basin, of which 24.73 percent are located in urban areas and 75.27 are located in rural areas, which corresponds to the percentage of urban and rural population. Of the urban housing units, only 2.70 percent are located in urbanized areas and the remaining 97.30 percent are located in urban clusters. As with the rural population, the majority of the rural housing, at 98.31 percent, is non-farm.

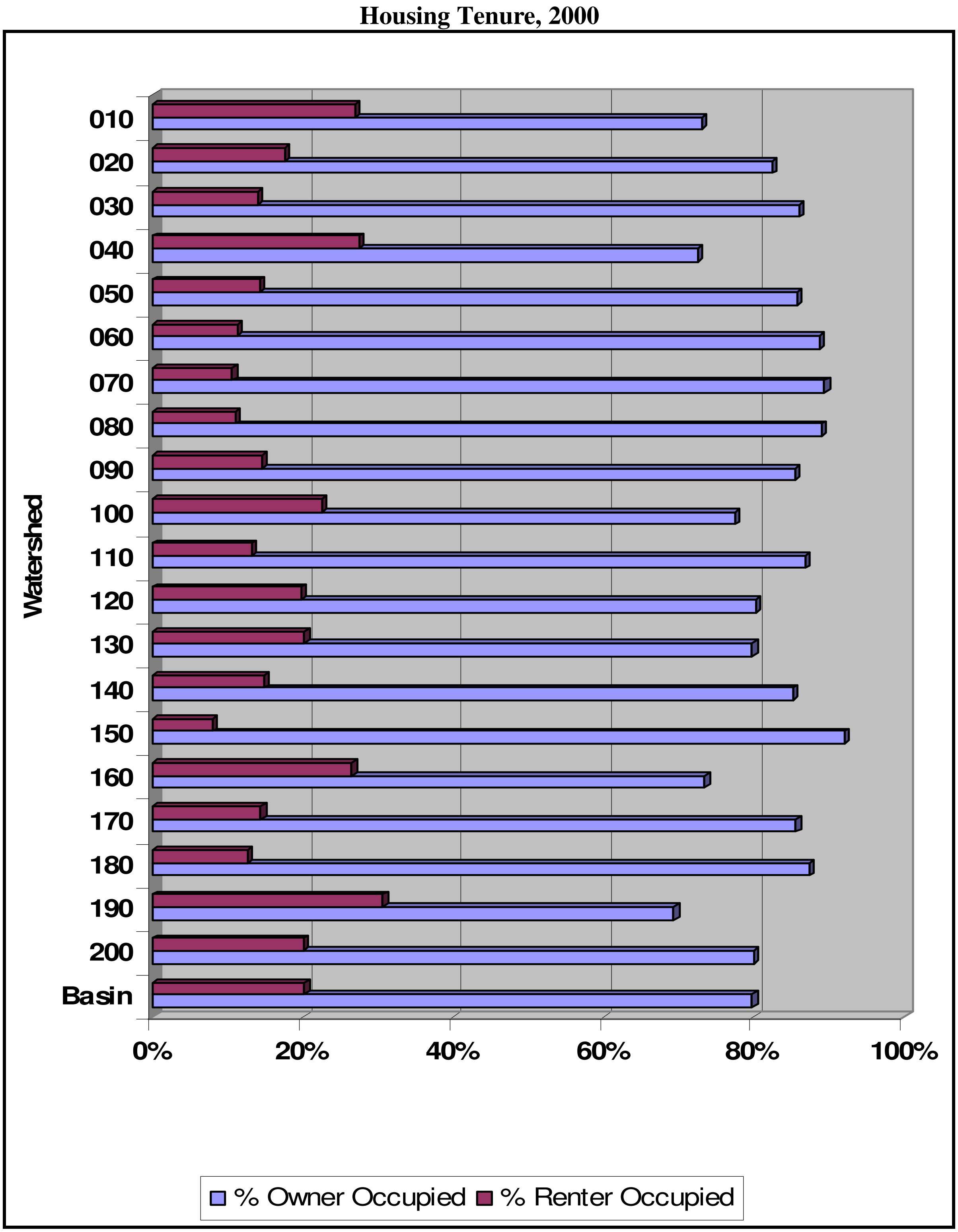
Within the basin boundaries, there are 42,404 occupied housing units, which is 86.46 percent of the total, and 6,639 vacant housing units, or 13.54 percent of the total housing stock. A large majority of the occupied housing units, at 79.81 percent, are owner-occupied while 20.19 percent are renter-occupied. Owner-occupancy is slightly higher in the Lower Coosa River Basin than in the State of Alabama, at 72.5 percent. Among the watersheds of the basin, owner-occupancy is highest in the Peckerwood Creek watershed, at 89.40 percent, and in the Spring Creek watershed, at 89.03 percent. Rental occupancy is highest in the Pigeon Roost Creek watershed, at 30.66 percent, and in the Kahatchee Creek watershed, at 27.41 percent.

Household size of owner-occupied housing is slightly larger than renter-occupied housing, with 81.97 percent of the population living in owner-occupied units and 18.03 percent living in renter-occupied units. The average household size of owner-occupied housing units is three persons per unit and the average household size of renter-occupied units is two persons per unit.

The racial occupancy of occupied housing units is similar between owner-occupied housing units and renter-occupied units primarily due to the racial composition of the basin population, overall. The occupancy of owner-occupied housing by whites, at 84.39 percent, is slightly higher than the proportion of white population in the basin, at 79.31 percent. Conversely, the occupancy of owner-occupied units by blacks, at 14.53 percent, and persons of other races, at 1.05 percent, is slightly lower than the corresponding proportions of black population in the basin at 18.82 percent and persons of other races at 1.87 percent. The reverse is true of renter-occupied housing units, with whites occupying 71.72 percent, blacks occupying 25.52 percent, and persons of other races occupying 2.76 percent.

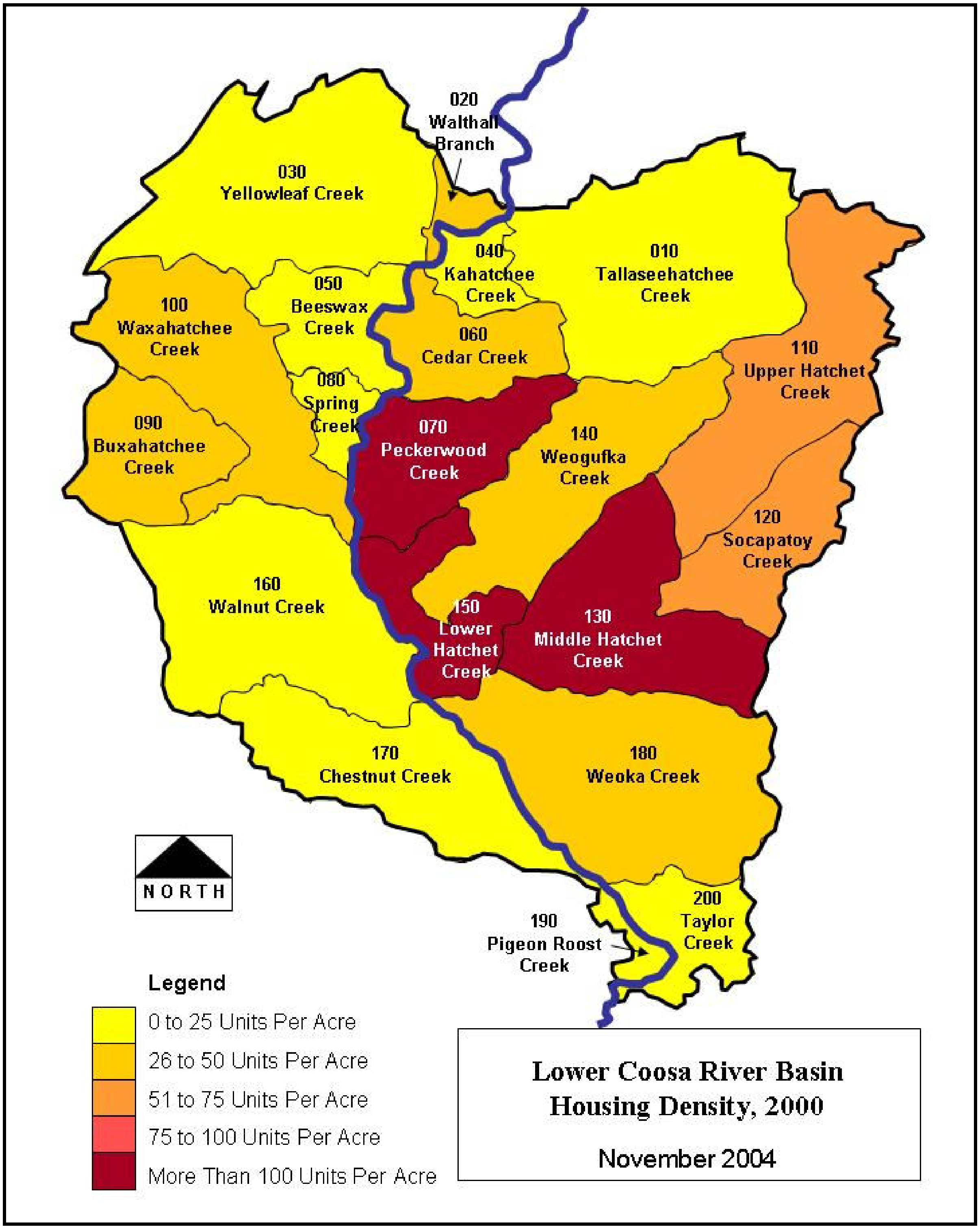
In a comparison of the 20 watersheds within the Lower Coosa River Basin, the Tallaseehatchee Creek watershed has, by far, the most housing units at 12,011 units, followed distantly by the Walnut Creek watershed at 5,238 units, the Yellowleaf Creek watershed at 4,907 units, and the Chestnut Creek watershed at 4,468 units. The remaining watersheds have less than 3,000 units each. Because of the variances in the geographic size of the watersheds, housing density does not correspond with the number of housing units per watershed. The Tallaseehatchee Creek watershed, which has the most housing units, has a housing density of only 10.67 units per acre. The highest housing densities are found in the Lower Hatchet Creek watershed at 140.33 units per acre, the Peckerwood Creek watershed at 110.88 units per acre, and the Middle Hatchet Creek watershed at 103.42 units per acre. Housing density in these three watersheds, however, is extreme. Housing density in the remaining watersheds is considerably less. Eight of the watersheds have a housing density of less than 25 units per acre; seven have a housing density between 25 and 50 units per acre; and, two have a housing density between 50 and 75 units per acre. Housing density for that basin overall is 25.50 units per acre. Figure 50 provides a comparison among the watersheds of housing tenure, while Figure 51 is a map showing housing density in the watersheds.

Figure 50:



Source: U.S. Bureau of Census, 2000 and Delaney Consultant Services, Inc.

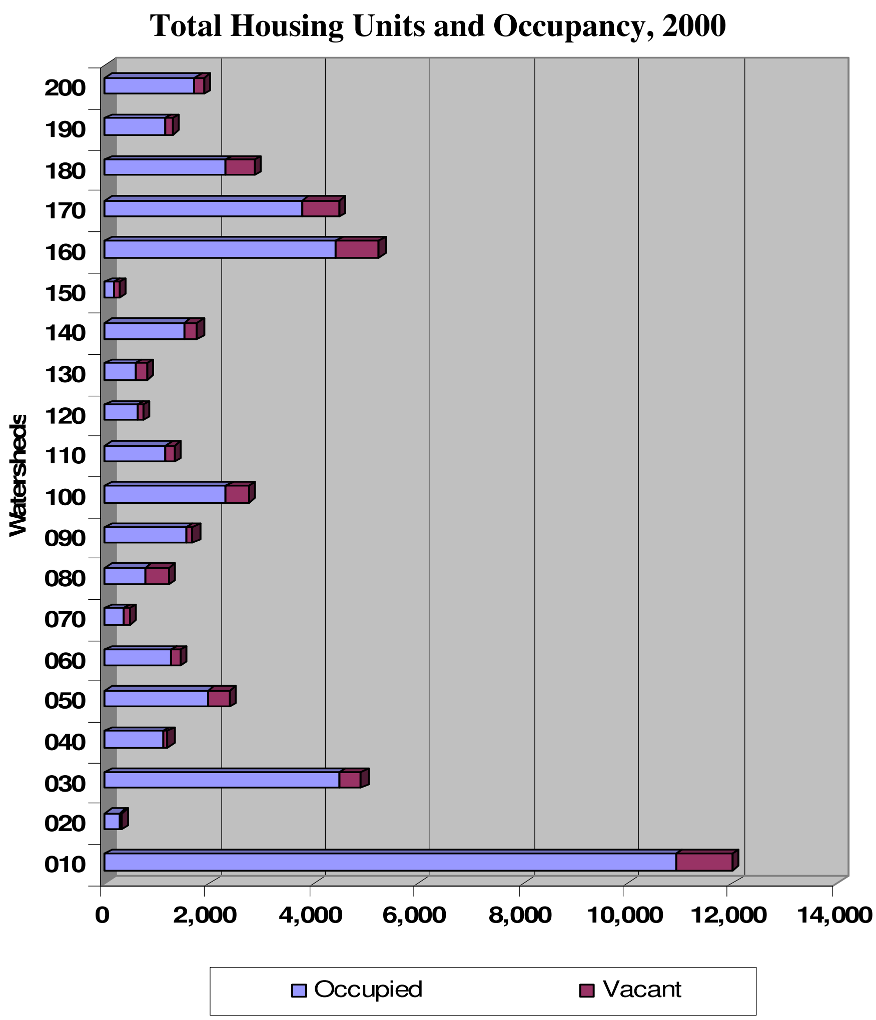
Figure 51:



Source: U.S. Bureau of Census, 2000 and Delaney Consultant Services, Inc.

In most areas, the 13.54 percent of vacant housing units would be uncommonly high, however in the Lower Coosa River Basin, this can be attributed to some degree to vacation or part-time housing around the three lakes in the basin. According to the 2000 Census, 41.01 percent of the vacant housing is for seasonal, recreational or occasional use. Of the remaining vacant housing units at the time of the 2000 Census, 14.12 percent are for rent, 10.69 percent are for sale, 6.14 percent have been rented or sold but are not occupied, 0.09 percent are for migrant workers, and 27.95 percent are listed as other vacant. A more accurate picture of housing vacancy rate can be determined by looking at the number of ‘other’ vacant housing units with the number of vacant housing units that are for sale or rent as a percentage of the total housing stock, which in the case of the Lower Coosa River Basin, is 7.97 percent. Generally, a vacancy rate between 4.0 percent and 6.0 percent provides a stable growth environment, offering choice in housing for those who are moving but not so much vacant housing as to flatten the market value of the existing housing stock. The State of Alabama has an available housing vacancy rate of 9.14 percent and a seasonal housing vacancy rate of 2.4 percent.

Figure 52:



Source: U.S. Bureau of Census, 2000 and Delaney Consultant Services, Inc.

Figure 53:

HUC	Watershed	Total Housing Units	% Available	% Seasonal	% Total Vacant
010	Tallaseehatchee Creek	12,011	7.97%	1.08%	9.05%
020	Walthall Branch	324	8.80%	1.85%	10.65%
030	Yellowleaf Creek	4,907	7.23%	1.43%	8.66%
040	Kahatachee Creek	1,195	7.33%	0.75%	8.08%
050	Beeswax Creek	2,377	6.98%	10.77%	17.75%
060	Cedar Creek	1,431	6.35%	5.30%	11.65%
070	Peckerwood Creek	479	7.00%	19.14%	26.14%
080	Spring Creek	1,226	5.84%	31.76%	37.60%
090	Buxahatchee Creek	1,683	6.57%	1.63%	8.20%
100	Waxahatchee Creek	2,758	7.82%	7.97%	15.79%
110	Upper Hatchet Creek	1,340	10.09%	3.02%	13.11%
120	Socapatoy Creek	727	8.49%	5.40%	13.88%
130	Middle Hatchet Creek	814	12.62%	15.39%	28.00%
140	Weogufka Creek	1,754	7.55%	5.87%	13.43%
150	Lower Hatchet Creek	277	9.18%	29.34%	38.51%
160	Walnut Creek	5,238	7.12%	8.54%	15.66%
170	Chestnut Creek	4,468	8.91%	6.65%	15.56%
180	Weoka Creek	2,861	8.53%	10.72%	19.25%
190	Pigeon Roost Creek	1,299	13.13%	0.00%	13.13%
200	Taylor Creek	1,876	8.02%	0.42%	8.44%
	Lower Coosa River Basin	49,042	7.97%	5.55%	13.52%

Housing Vacancy Rates, 2000

Source: U.S. Bureau of Census, 2000 and Delaney Consultant Services, Inc.

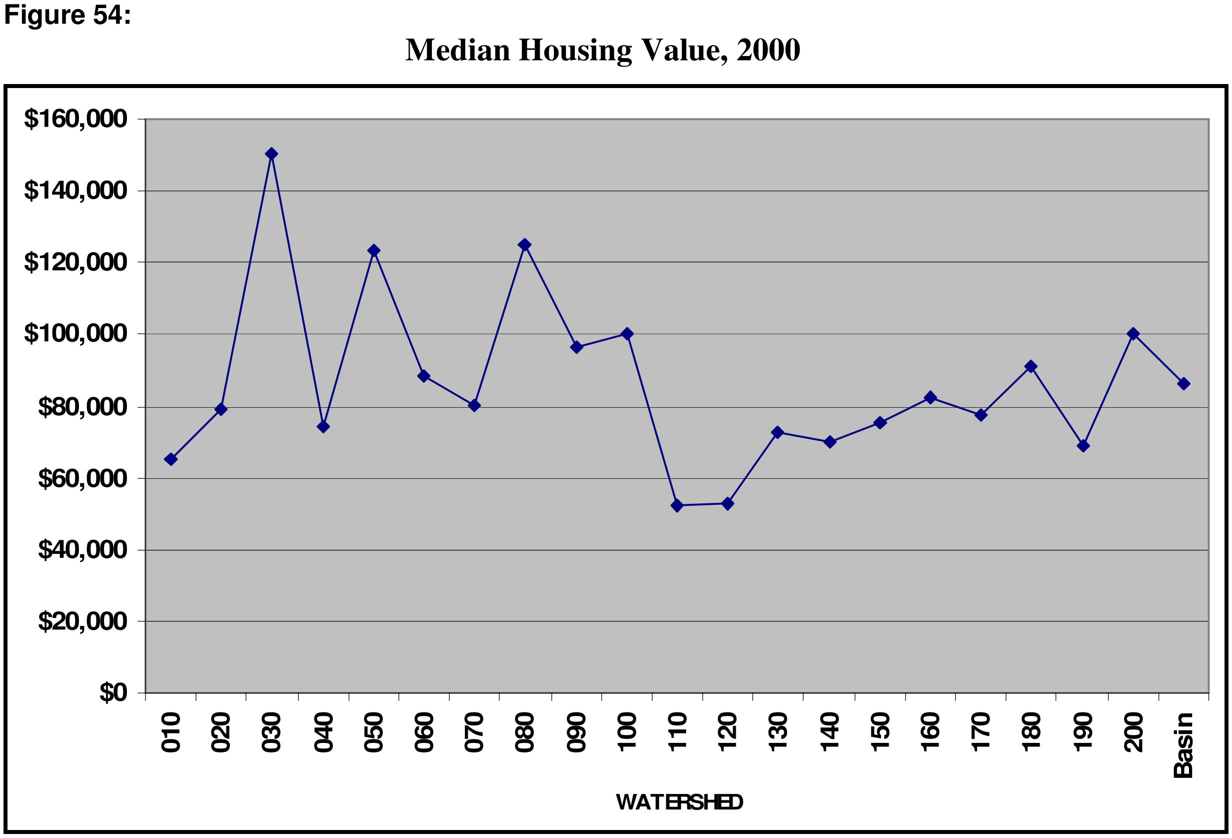
Watersheds with the highest overall vacancy rate include Lower Hatchet Creek at 38.51 percent, Spring Creek at 37.60 percent, Middle Hatchet Creek at 28.00 percent and Peckerwood Creek at 19.14 percent. These four watersheds also have the percentage of seasonal housing units, ranging from 15.39 percent to 31.76 percent. Watersheds with the highest available, or 'true', vacancy rate are Pigeon Roost Creek at 13.13 percent, Middle Hatchet Creek at 12.62 percent, and Upper Hatchet Creek at 10.09 percent and watersheds with the lowest available vacancy rate are Spring Creek at 5.84 percent, 6.35 percent, 6.57 percent, 6.98 percent.

The median year that housing structures were built ranges from 1965 in the Pigeon Roost Creek watershed to 1986 in the Taylor Creek and Yellowleaf Creek watersheds. The average median year that structures were built throughout the basin is 1977. The majority of the housing units in the basin are single unit detached units, at 64.05 percent, which is comparable to the State of Alabama, at 66.2 percent. The Lower Coosa River Basin, however, does have significantly more manufactured housing, at 27.82 percent, than the State, at 16.3 percent.

The majority of the occupied housing units in the Lower Coosa River Basin have full facilities available. Only 0.19 percent do not have any source of heat. The primary sources of heat for the remaining housing units are electricity, utilized by 45.36 percent of the units, propane gas, utilized by 28.00 percent of the units, and utility gas, utilized by 24.21 percent of the units. A large majority of the housing units in the basin have telephone service available, with 96.97 percent of the owner-occupied housing units have phone service and 90.96 percent of the renter-occupied units having phone service. The increased reliance upon cellular telephone service as the primary telephone service in the last decade may account, to some degree, for the lower percentage of renter-occupied units with telephone service. Of the total housing units in the basin, 98.55 percent have complete plumbing facilities and 98.51 percent have complete kitchen facilities. The percentage of occupied housing units with no vehicle available is 7.5 percent as compared to 8.30 percent for the State of Alabama. This percentage is considerably higher for renter-occupied units, at 20.19 percent, than for owner-occupied units, at 4.89 percent. These percentages are fairly consistent throughout the watersheds of the basin. Only the Tallaseehatchee Creek watershed has higher percentages of housing units without heat, phone service, and plumbing and kitchen facilities than the other watersheds.

Median housing value within the Lower Coosa River Basin are slightly higher, at $86,282 for owner-occupied housing units than the median housing value for the State, at $85,100. Median value for owner-occupied mobile homes within the basin is significantly higher, at $35,548, than for the State, at $28,400. Median housing value is highest in the Yellowleaf Creek watershed at $150,481, followed by the Weoka Creek watershed at $124,933, and the Beeswax Creek watershed at $123,240. Median housing value is lowest in the Upper Hatchet Creek and Socapatoy Creek watersheds, at $52,083 and $52,775, respectively.

Figure 54:



Growth Trends

The population of the counties that make up the Lower Coosa River Basin has increased significantly during the last two decades. In fact, portions of four of Alabama's top ten ranked counties for growth between 1990 and 2000 are located in the Lower Coosa River Basin: Shelby County, which grew by 44.2 percent, was ranked first; Elmore County, which grew by 33.9 percent, was ranked third; Autauga County, which grew by 27.6 percent, was ranked seventh; and, Chilton County, which grew by 22.0 percent, was ranked tenth. According to the 2000 Census, all of the seven counties increased in population between 1990 and 2000. Clay and Coosa Counties, which had lost population between 1980 and 1990, experienced growth increases between 1990 and 2000 of 7.6 percent and 10.3 percent, respectively. Talladega County experienced an 8.4 percent increase in population in the same time period.

Of the 14 municipalities, only Goodwater and Rockford lost population between 1990 and 2000. The other 12 municipalities experienced population increase, with Chelsea and Harpersville more than doubling their population and experiencing 121.9 percent 109.8 percent increases, respectively. Other significant growth areas include Calera, with a 47.8 percent increase; Pelham, with a 47.1 percent increase; Thorsby, with a 24.2 percent increase; Wetumpka, with a 24.2 percent increase; and Wilsonville, with a 30.9 percent increase. More modest growth was experienced by Childersburg, Clanton, Columbiana, Jemison, and Sylacauga, with population increases between 0.8 percent and 18.4 percent.

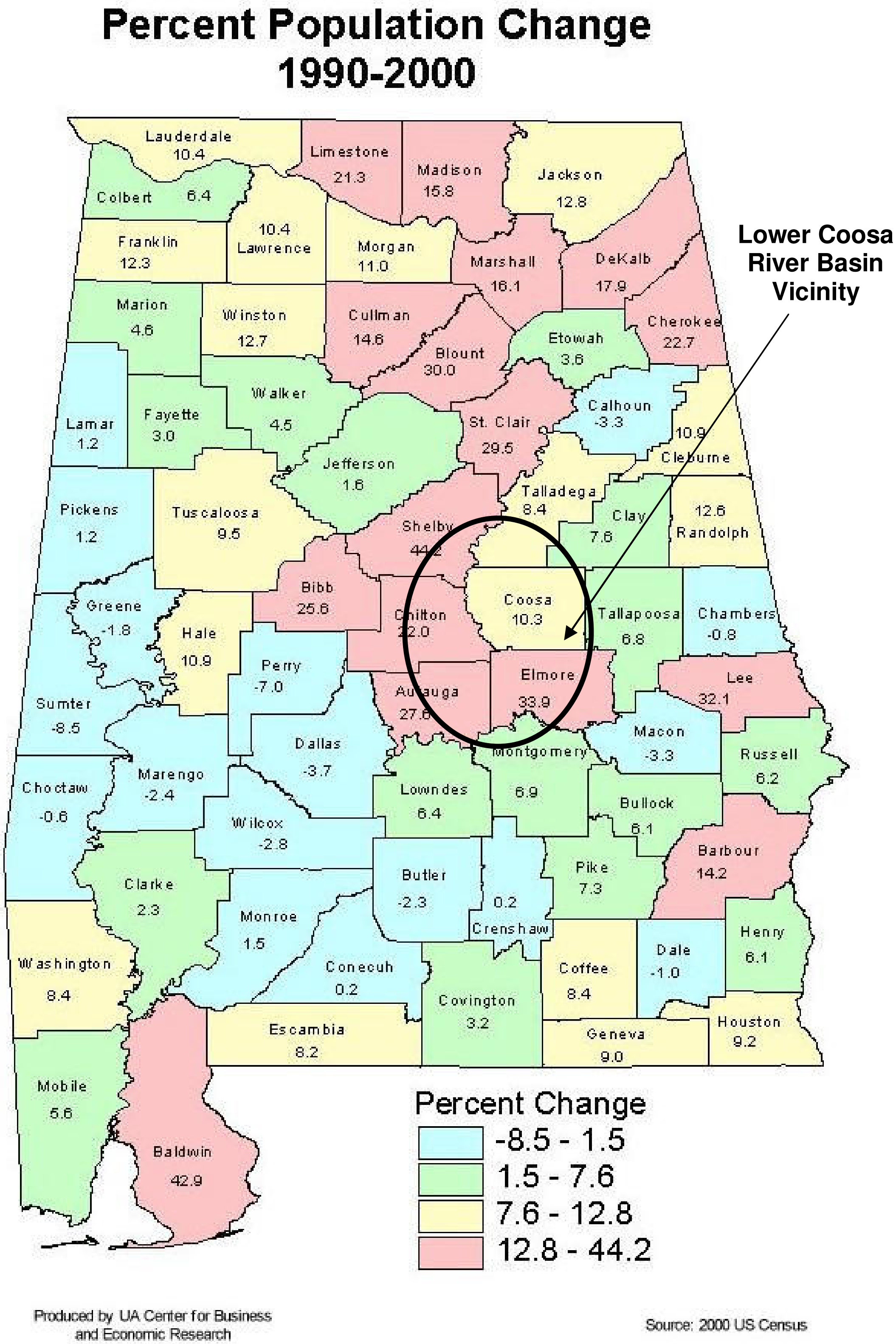
Figure 55:

Population Trends, 1980 to 2000

Jurisdiction	1980 Population	1990 Population	2000 Population	1990 – 2000	
				Number Change	Percent Change
Autauga County	32,259	34,222	43,671	9,449	27.6
Chilton County	30,612	32,458	39,593	7,135	22.0
Clay County	13,703	13,252	14,254	1,002	7.6
Coosa County	11,377	11,063	12,202	1,139	10.3
Elmore County	43,390	49,210	65,874	16,664	33.9
Shelby County	66,298	99,358	33,060	43,935	44.2
Talladega County	73,826	74,107	80,321	6,214	8.4
Calera	2,035	2,136	3,158	1,022	47.8
Chelsea	--	1,329	2,949	1,620	121.9
Childersburg	5,084	4,579	7,927	348	7.6
Clanton	5,832	7,669	7,800	131	1.7
Columbiana	2,655	2,968	3,316	348	11.7
Goodwater	1,895	1,840	1,633	-207	-11.3
Harpersville	934	772	1,620	848	109.8
Jemison	1,828	1,898	2,248	350	18.4
Pelham	6,759	9,765	14,369	4,604	47.1
Rockford	494	461	428	-33	-7.2
Sylacauga	12,708	12,520	12,616	96	0.8
Thorsby	1,422	1,465	4,820	355	24.2
Wetumpka	4,341	4,670	5,726	1,056	22.6
Wilsonville	914	1,185	1,551	366	30.9

Source: University of Alabama Center for Business and Economic Research.

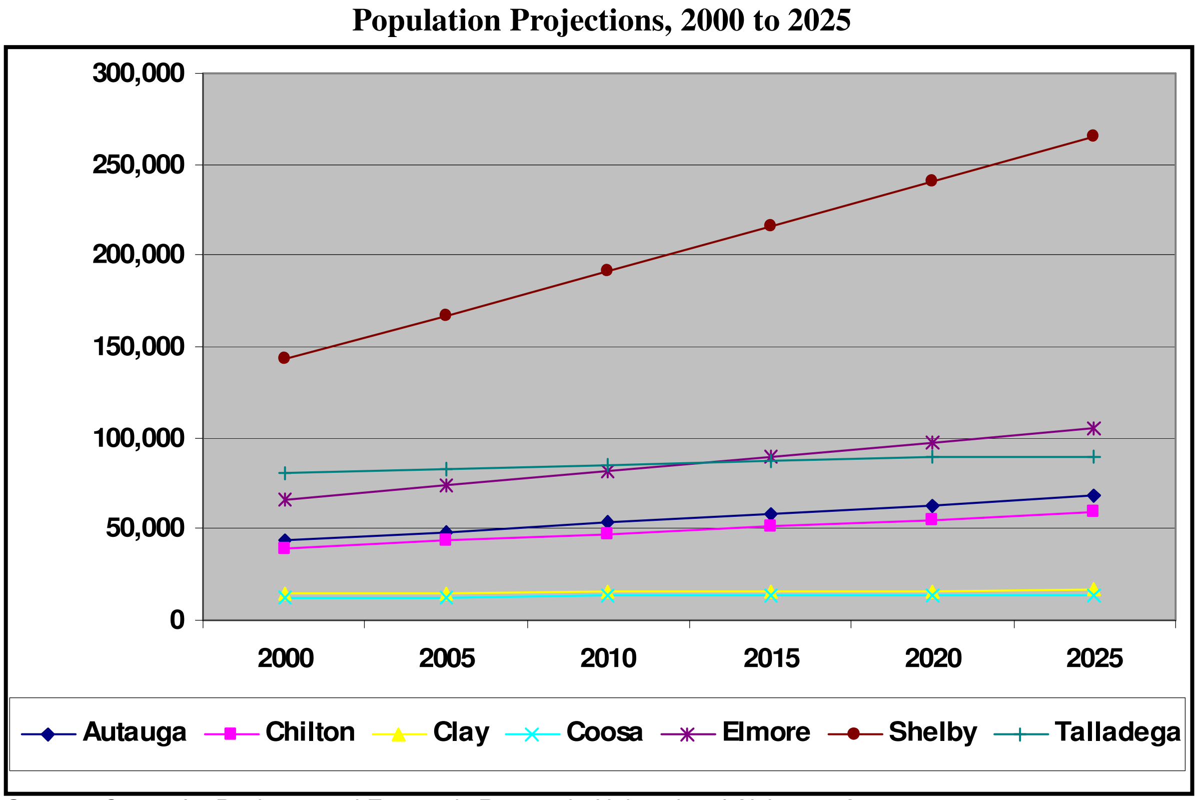
Figure 56:



Source: University of Alabama Center for Business and Economic Research. October 2004. www.cber.cba.ua.edu.

The Center for Business and Economic Research, located at the University of Alabama, provides population projections for Alabama counties, based on trends between the 1990 and 2000 Censuses. These projections show a cumulative increase in population for the seven counties in the Lower Coosa River Basin of 54.85 percent, resulting in an additional 218,959 persons in the seven counties. In comparison, the State of Alabama is expected to experience a 21.1 percent population increase during the same time period.

Figure 57:



Source: Center for Business and Economic Research, University of Alabama, August 2001.

Figure 58:

Lower Coosa River Basin County Population 2000 and Projections 2005-2025

County	Census 2000	Projections					Change 2000-2025		State Rank
		2005	2010	2015	2020	2025	Number	%	
Shelby	143,293	167,021	191,474	216,308	241,030	265,083	121,790	85.0%	1
Elmore	65,874	73,895	81,959	89,940	97,715	105,245	39,371	59.8%	4
Autauga	43,671	48,597	53,469	58,273	63,217	68,368	24,697	56.6%	6
Chilton	39,593	43,455	47,398	51,347	55,242	59,022	19,429	49.1%	8
Clay	14,254	14,773	15,277	15,738	16,160	16,553	2,299	16.1%	27
Coosa	12,202	12,697	13,127	13,478	13,727	13,875	1,673	13.7%	31
Talladega	80,321	83,110	85,524	87,518	89,027	90,021	9,700	12.1%	33

Note: Projections in this series are based on trends between the 1990 and 2000 censuses.
Source: U.S. Census Bureau and Center for Business and Economic Research, The University of Alabama, August 2001.

While all of the seven counties are in the top half of Alabama counties in growth projections over the next 20 years, Shelby, Elmore, Autauga and Chilton Counties remain in the top ten counties in Alabama for projected growth. As expected from the past population growth trends, Shelby County is projected to experience the most significant growth increase, at an 85 percent increase in population. Shelby County is followed by Elmore County, ranked fourth with a projection of a 59.8 percent increase in population; Autauga County, ranked sixth with a projection of a 56.6 percent increase; and Chilton County, ranked eighth with a projection of a 49.1 percent increase in population. Clay, Coosa and Talladega are projected to experience more modest population increases, ranging from 12.1 percent to 16.1 percent.

The impact of the projected population increases in the seven counties that make up the Lower Coosa River Basin will, of course, have an impact on the basin itself. Extrapolations of the population projections provided by the Center for Business and Economic Research show a projected population increase between 158,773 and 169,884 persons, representing an increase between 44.72 percent and 54.85 percent in the Lower Coosa River Basin. Without more detailed study and inventory of population trends at the local level, estimating the projected population growth on the Lower Coosa River Basin was done in two ways. The percentage of the total 7-county population that is located in the basin was calculated at 27.48 percent. This percentage was then multiplied by the total projected population increase in the seven counties, which resulted in a projected increase of 60,174 percent in the basin. Therefore, the one population projection for 2025 in the Lower Coosa River Basin is 169,884 persons.

109,710 / 399,208 = 27.48 percent in basin
.2748 * 218,959 = 60,174 population increase in basin
60,174 + 109,710 = 169,884 projected 2025 population in basin

The second population projection method uses the percentage of each county's population that is located within the Lower Coosa River Basin and multiplies the percentage by the projected 2025 population of each county. The resulting increase for each county's portion of the population was then added together to derive the total projected population increase 49,063 persons in the Lower Coosa River Basin, which represents a 44.72 percent increase and results in projected 2025 population of 158,773 persons.

Figure 59:

Population Projections for Lower Coosa River Basin, 2025

County	2000 Population	Projected 2025 Population	Projected Number Increase	% of Population in Lower Coosa River Basin	Projected Increase in Basin
Autauga	43,671	68,368	24,697	1.65	408
Chilton	39,593	59,022	19,429	50.89	9,887
Clay	14,254	16,553	2,299	6.71	154
Coosa	12,202	13,875	1,673	78.13	1,307
Elmore	65,874	105,245	39,371	24.79	9,760
Shelby	143,293	265,083	121,790	19.16	23,335
Talladega	80,321	90,021	9,700	43.42	4,212
Total					49,063

Source: U.S. Census Bureau and Center for Business and Economic Research, The University of Alabama, August 2001, and Delaney Consultant Services, Inc.

In 1996 a document was prepared for the State of Alabama Office of Water Resources entitled, "Economic Forecast of Population and Employment; State of Alabama. Volumes 1 and 2." The document was prepared by DRI/McGraw Hill, with the "immediate objective…to provide long-range, unbiased forecasts for use as inputs to various models that will help determine the present and future capabilities of the water resources in the State of Alabama." The information included in the report is organized by 12 river basins, however, Autauga County information is included in the Alabama River basin, Clay and Elmore County information is included in the Tallapoosa River basin, and Shelby County information is included in the Cahaba River basin. There was no attempt to subdivide county information into one or more river basins, and the report does not provide detail information on the sub-basins, such as the Lower Coosa River Basin. It is possible, however, to derive the county data for the seven counties that are included in the Lower Coosa River Basin to provide a long term picture of population and employment at the county level, rather than the sub-basin level. Some overall generalizations regarding the entire Coosa River basin are also included.

According to DRI/McGraw Hill, the annual population growth of the Coosa River basin has been slightly ahead of the state, and through 2050, this level of growth will continue. The report also states that the Coosa River basin can expect a 60 percent increase in population over the 1995 population level and that the working age population of basin will shrink dramatically over the forecast period to 56 percent in 2050 from 63 percent in 1995. Similarly, the Coosa River basin's retired-aged population will grow faster than in the state as a whole, rising from 13.6 in 1995 to 23.5 in 2050.

Population forecasts for the counties in the Lower Coosa River Basin, as presented in the DRI/McGraw Hill report, are roughly in line with the projections provided with the Center for Business and Economic Research, being more conservative in most of the counties and having higher estimates in Shelby and Talladega Counties. The cumulative population forecast for the seven counties is a 109.67 percent increase between 2020 and 2050, with the least increase occurring in Clay and Coosa Counties and the greatest increase occurring in Shelby County.

Figure 60:

Population Forecast by County, 1975 to 2050

	1975	1985	1995	2000	2010	2020	2050	% Increase 2000-2050
Autauga	29,700	32,200	39,700	42,900	50,000	57,200	75,600	76.22%
Chilton	28,600	31,600	36,600	38,300	43,100	48,000	60,700	58.49%
Clay	13,200	13,700	13,500	13,500	14,000	14,100	14,600	8.15%
Coosa	11,500	11,000	11,600	11,500	11,700	11,700	12,600	9.57%
Elmore	39,700	45,600	55,700	59,100	66,800	73,900	93,000	57.36%
Shelby	51,700	79,600	123,200	133,600	181,200	242,900	396,900	197.08%
Talladega	69,000	75,300	79,800	72,200	90,300	100,100	124,700	72.71%
Total	243,400	289,000	360,100	371,100	457,100	547,900	778,100	109.67%

Source: Economic Forecast of Population and Employment; State of Alabama, Volume 1, December 1996. DRI/McGraw Hill, Lexington, Massachusetts.

Chapter 4
Ecoregions and Habitat

The Lower Coosa River Basin is home to more than just its human residents. As a part of the Mobile River Basin, the Lower Coosa River Basin helps to support a highly diverse aquatic flora and fauna, especially manifested in its freshwater fishes, mussels and snails. The Mobile River Basin's endemic (native to a region and found nowhere else) fauna includes 40 fishes, 33 mussels, 110 aquatic snails, as well as turtles, aquatic insects, and crustaceans.[1] Of these, 32 aquatic animal and plant species are protected under the Endangered Species Act of 1973 and an additional seven species have received protection since 1973.[1] The Mobile River Basin Aquatic Ecosystem Recovery Plan, published in 2000, is the sole recovery plan for 22 aquatic species, which includes four fish, 11 mussels, and seven snails. Of these 22 species, five are currently located in the Lower Coosa River Basin, however, historical populations included 17 of the species covered under the Mobile River Basin Recovery Plan. Of the aquatic species covered under other recovery plans, one is currently found in the Lower Coosa River Basin and four had historical populations in the basin. Further, a survey of Alabama's Federally Listed Species by county showed that 14 aquatic and non-aquatic threatened, endangered or candidate species are currently located in the Lower Coosa River Basin.[2]

Endangered species are important to the overall watershed management plan for the Lower Coosa River Basin not just because of their own individual importance, but because endangered species are a prime indicator of imbalance in an ecosystem. Species become threatened or endangered primarily due to a loss of, or change in, habitat. Most often, the habitat alteration is due to human activities, such as river impoundments, stream channelization, mining, dredging and/or pollution from both point and non-point sources. The loss of population of an endangered species, or the extinction of a species, begins a chain reaction of alteration of habitat and possibly food source for other species.

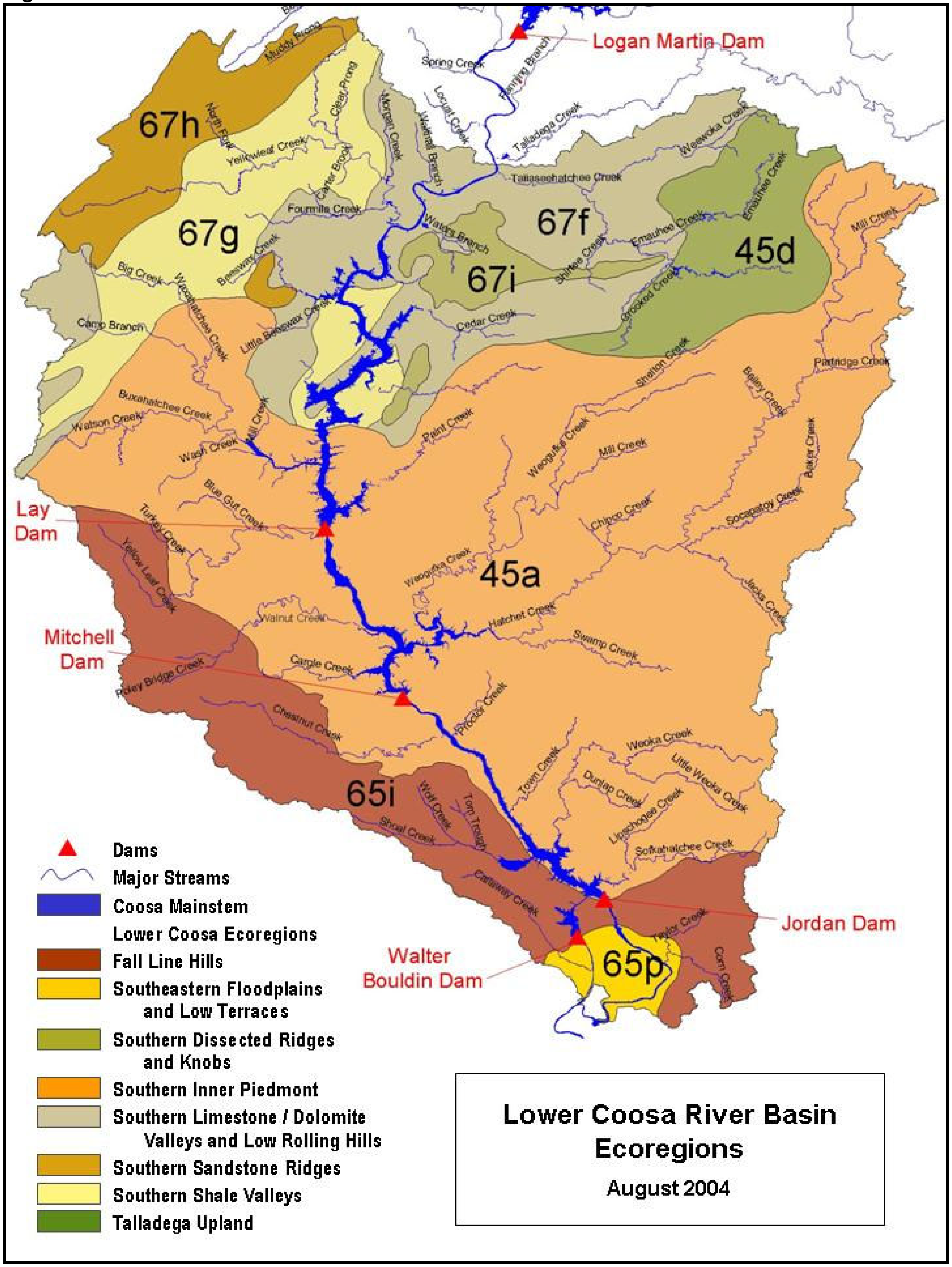
This chapter will address the ecoregions of the Lower Coosa River Basin and the habitats of the known endangered species found in the basin. In doing so, the Lower Coosa River Basin Management Plan will comply with the objectives of the Mobile River Basin Aquatic Ecosystem Recovery Plan, as well as recovery plans for other species. The intent in addressing the ecoregion and endangered species is, to the extent possible, to maintain the balance of human intervention with the biological integrity of the watershed.

Ecoregions

An ecosystem is a geographic area including all the living organisms (people, plants, animals, and microorganisms), their physical surroundings (such as soil, water, and air) and the natural cycles that sustain them. All of these elements are interconnected. Managing any one resource affects the others in that ecosystem. Ecosystems can be small or large. In 1994, the Fish and Wildlife Service (FWS) adopted the ecosystem approach to fish and wildlife conservation, which achieves landscape-level conservation of fish, wildlife, plants and their habitats through cross program coordination within the U.S. Fish and Wildlife Service as well as partnerships and coordination with external agencies and organizations. In the ecosystem approach, U.S. FWS established 53 ecosystem units based on U.S. Geological Survey watersheds.[3] In Alabama, the six ecosystems were further subdivided into 29 Level IV sub-ecoregions. Eight of the Level IV sub-ecoregions are found within the Lower Coosa River Basin.

The Lower Coosa River Basin lies within three of the Level III Ecosystem areas: the Piedmont, the Southeastern Plains, and the Ridge and Valley. The Piedmont is considered the nonmountainous portion of the old Appalachians Highland by physiographers, the northeast-southwest trending Piedmont ecoregion comprises a transitional area between the mostly mountainous ecoregions of the Appalachians to the northwest and the relatively flat coastal plain to the southeast. It is a complex mosaic of Precambrian and Paleozoic metamorphic and igneous rocks, with moderately dissected irregular plains and some hills. The soils tend to be finer-textured than in coastal plain regions. Once largely cultivated, much of this region has reverted to successional pine and hardwood woodlands, with an increasing conversion to an urban and suburban land cover. The Southeastern Plains are irregular and have a mosaic of cropland, pasture, woodland, and forest. Natural vegetation was predominantly longleaf pine, with smaller areas of oak-hickory-pine and Southern mixed forest. The Cretaceous or Tertiary-age sands, silts, and clays of the region contrast geologically with the older metamorphic and igneous rocks of the Piedmont (45), and with the Paleozoic limestone, chert, and shale found in the Interior Plateau (71). Elevations and relief are greater than in the Southern Coastal Plain (75), but generally less than in much of the Piedmont. Streams in this area are relatively low-gradient and sandy-bottomed. The Ridge and Valley is a northeast-southwest trending, relatively low-lying, but diverse ecoregion sandwiched between generally higher, more rugged mountainous regions with greater forest cover. As a result of extreme folding and faulting events, the region's roughly parallel ridges and valleys have a variety of widths, heights, and geologic materials, including limestone, dolomite, shale, siltstone, sandstone, chert, mudstone, and marble. Springs and caves are relatively numerous. Present-day forests cover about 50 percent of the region. The ecoregion has a diversity of aquatic habitats and species of fish.[4]

Figure 61:



Source: Alabama Department of Environmental Management. 2004

Habitat

In its most general terms, habitat is defined as the region where a plant or animal naturally grows or lives, its native environment.[5] As stated previously, the Lower Coosa River Basin and the Mobile River Basin are home to a number of species that are not found anywhere else. And, as also stated, the fact that these species are now threatened or endangered is a clear sign of habitat alteration, modification or habitat loss. In other words, there is an imbalance within the basin that is causing these species to lose their ability to survive within their native habitats. These alterations, or imbalances, can be caused by a number of sources such as, shoreline construction or alteration, biological modification, and wetland alteration. Most of the actions that cause these alterations are minor individual activities, which, when combined together, result in a significant impact on the balance of the ecosystem.

To better understand what types of actions cause habitat alterations, it is important to first understand the original habitat of those species which are now threatened or endangered and what has happened in each instance to change the habitat. This section provides a summary of the concerns for each of the 14 threatened or endangered species that are found in the Lower Coosa River Basin. Figures 62 and 63 provide a list of the species covered under the Mobile River Basin Aquatic Ecosystem Recovery Plan and other recovery plans, and Figure 64 provides a list by county of all of Alabama's federally listed threatened or endangered species. Aquatic species include one fish, the blue shiner; two mussels, the Alabama moccasinshell and the fine-lined pocketbook; and three snails, the lacy elimia, the painted rocksnail and the tulatoma snail. Non-aquatic species include three birds, the bald eagle, the wood stork and the red-cockaded woodpecker; two bats, the gray bat and the Indiana bat; and four plants, the Alabama canebrake pitcher plant, Price's potato bean, the white fringeless orchid, and the Georgia rockcress.

Alabama Moccasinshell. Federally listed as threatened in 1993, the Alabama moccasinshell is a small, delicate mussel approximately 1.2 inches in length. The shell is narrowly elliptical (oval) with a well-developed, acute posterior ridge that terminates in a sharp point on the posterior ventral margin. The posterior slope is finely corrugated. The outer surface is yellow to brownish yellow, with broken green rays across the entire surface of the sell. The inner surface is thin and translucent along the margins and salmon-colored in the beak cavity.[1] Historically, the Alabama moccasinshell was known from the Alabama River, the Tombigbee River drainage, the Cahaba River drainage, and the Coosa River drainage. Known populations within the Lower Coosa River Basin are located in Hatchet Creek.[1]

The Alabama moccasinshell was listed as a federally threatened species due to habitat modification, sedimentation, eutrophication, and water quality degradation. This species does not tolerate impoundment or channelization. It inhabits the small spaces between particles of grave and cobble substrates, and is very sensitive to sedimentation and erosion. The recovery plan states that surviving populations are threatened by urban and agricultural runoff, surface mine drainage, small stream impoundment projects, industrial and sewage treatment plant discharges, and channel degradation caused by sand and gravel mining. Because recovery of the Alabama moccasinshell to the point of delisting is unlikely in the near future, the immediate recovery objective is to prevent the continued decline of the Alabama moccasinshell by locating, protecting, and restoring stream drainages with extant populations.[1]

Figure 62:

Species Covered Under the Recovery Plan for the Mobile River Basin Aquatic Ecosystem

Species	Known Populations In Lower Coosa		Historic Populations In Lower Coosa	
	Stream	County	Stream	County
Fish				
Alabama Sturgeon	--	--	Coosa & Tribs	All
Cherokee Darter	--	--	Coosa & Tribs	All
Etowah Darter	--	--		
Goldline Darter	--	--	--	--
Mussels				
Alabama Moccasinshell	Hatchet Creek	Coosa	Coosa & Tribs	All
Coosa Moccasinshell	--	--	Coosa & Tribs	All
Dark Pigtoe	--	--		
Fine-Lined Pocketbook	Yellowleaf Creek	Shelby	Coosa & Tribs	All
	Tallaseehatchee	Clay, Talladega		
Orange-Nacre Mucket	--	--	--	--
Ovate Clubshell	--	--	Coosa & Tribs	All
Southern Acornshell	None	None	Coosa & Tribs	Above Fall Line
Southern Clubshell	--	--	Coosa & Tribs	All
Southern Pigtoe	--	--	Coosa & Tribs	All
Triangular Kidneyshell	--	--	Coosa & Tribs	All
Upland Combshell	None	None	Coosa & Tribs	Above Fall Line
Snails				
Cylindrical Lioplax	--	--	Coosa, Yellowleaf	Shelby
Flat Pebblesnail	--	--	Coosa Mainstem	All
Lacy Elimia	Weewoka Creek	Talladega	Coosa Mainstem	Shelby, Talladega, Chilton, Coosa
			Tallaseehatchee	Talladega
Painted Rocksnail	Buxahatchee Cr	Shelby, Chilton	Coosa & Tribs	All
Plicate Rocksnail	--	--	--	--
Round Rocksnail	--	--	Coosa River	
			Yellowleaf	Shelby
			Waxahatchee	Chilton
Tulatoma Snail	Coosa (below Jordan Dam)	Elmore	Coosa & Tribs	All
	Weogufka Creek	Coosa		
	Hatchet Creek	Talladega, Coosa		
	Yellowleaf Creek	Shelby		

Source: U.S. Fish and Wildlife Service, Southeast Region. Recovery Plan for Mobile River Basin Aquatic Ecosystem. 2000

Figure 63:

Aquatic Species Covered Under Other Recovery Plans				
Species	**Known Populations In Lower Coosa**		**Historic Populations In Lower Coosa**	
	Stream	**County**	**Stream**	**County**
Turtles				
Alabama Redbelly Turtle	--	--	--	--
Flattened Musk Turtle	--	--	--	--
Fish				
Amber Darter	--	--	--	--
Blue Shiner	Weogufka Creek	Coosa	Coosa & Tribs	All
Cahaba Shiner	--	--	Coosa	Speculative
Conasauga Logperch	--	--	--	--
Gulf Sturgeon	--	--	--	--
Pygmy Sculpin	--	--	--	--
Watercress Darter	--	--	--	--
Mussels				
Black Clubshell	--	--	--	--
Flat Pigtoe	--	--	--	--
Heavy Pigtoe	--	--	Coosa Mainstem	All
Inflated Heelsplitter	--	--	Coosa	All
Southern Combshell	--	--	Coosa	All
Stirrupshell	--	--	--	--
Plants				
Harperella	--	--	--	--
Kral's Water-Plantain	--	--	--	--

Source: U.S. Fish and Wildlife Service, Southeast Region. Recovery Plan for Mobile River Basin Aquatic Ecosystem. 2000

Figure 64:

Alabama's Federally Listed Species
By County

	Key		
E	Endangered	PT	Proposed to be listed as Threatened
T	Threatened	PCH	Proposed Critical Habitat
CH	Critical Habitat has been designated	C	Candidate Species
PE	Proposed to be listed as Endangered	(P)	Possible Occurrence

	County	Species	In Lower Coosa	Mobile Recovery Plan	Other Recovery Plan
E	Autauga	Wood Stork	Yes	No	
E	Autauga	Alabama Sturgeon	No	Yes	No
E	Autauga	Alabama Canebrake Pitcher Plant	Yes	No	
T	Autauga	Price's Potato Bean	Yes	No	
T	Chilton	Bald Eagle	Yes	No	
E	Chilton	Red-Cockaded Woodpecker	Yes	No	
E	Chilton	Wood Stork	Yes	No	
E	Chilton	Alabama Canebrake Pitcher Plant	Yes	No	
T	Chilton	Painted Rocksnail	Yes	Yes	No
E	Clay	Southern Pigtoe Mussel	No (hist)	Yes	
T	Clay	Blue Shiner	Yes	No	Yes
E	Clay	Tulatoma Snail	Yes	Yes	No
T	Clay	Fine-Lined Pocketbook Mussel	Yes	Yes	No
C	Clay	White Fringeless Orchid	Yes	No	
E	Coosa	Red-Cockaded Woodpecker	Yes	No	
T	Coosa	Bald Eagle	Yes	No	
T	Coosa	Blue Shiner	Yes	No	Yes
E	Coosa	Tulatoma Snail	Yes	Yes	No
T	Coosa	Fine-Lined Pocketbook Mussel	Yes	Yes	No
T	Coosa	Kral's Water-Plantain	No	No	Yes
E	Elmore	Tulatoma Snail	Yes	Yes	No
T	Elmore	Fine-Lined Pocketbook Mussel	Yes	Yes	No
E	Elmore	Alabama Canebrake Pitcher Plant	Yes	No	
C	Elmore	Georgia Rockcress	Yes	No	

Figure 64, Continued:

Alabama's Federally Listed Species By County, Continued					
	County	Species	In Lower Coosa	Mobile Recovery Plan	Other Recovery Plan
E	Shelby	Gray Bat	Yes	No	
E	Shelby	Indiana Bat	Yes	No	
E	Shelby	Cahaba Shiner	No (hist spec)	No	
T	Shelby	Goldline Darter	No	Yes	No
T	Shelby	Painted Rocksnail	Yes	Yes	No
E	Shelby	Tulatoma Snail	Yes	Yes	No
E	Shelby	Southern Clubshell Mussel	No (hist)	Yes	No
E	Shelby	Triangular Kidneyshell Mussel	No (hist)	Yes	No
E	Shelby	Southern Acornshell Mussel	No (hist)	Yes	No
T	Shelby	Fine-Lined Pocketbook Mussel	Yes	Yes	No
T	Shelby	Orange-Nacre Mucket Mussel	No	Yes	No
T	Shelby	Alabama Moccasinshell Mussel	Yes	Yes	No
E	Shelby	Cylindrical Lioplax	No (hist)	Yes	No
E	Shelby	Flat Pebblesnail	No (hist)	Yes	No
T	Shelby	Round Rocksnail	No (hist)	Yes	No
E	Talladega	Red-Cockaded Woodpecker	Yes	No	
T	Talladega	Fine-Lined Pocketbook Mussel	Yes	Yes	No
E	Talladega	Coosa Moccasinshell Mussel	No (hist)	Yes	No
E	Talladega	Southern Pigtoe Mussel	No (hist)	Yes	No
E	Talladega	Tulatoma Snail	Yes	Yes	No
T	Talladega	Painted Rocksnail	Yes	Yes	No
T	Talladega	Lacy Elimia (Snail)	Yes	Yes	No
E	Tallapoosa	Red-Cockaded Woodpecker	Yes	No	
T	Tallapoosa	Fine-Lined Pocketbook Mussel	Yes	Yes	No

Note: Those species that are not currently found in the Lower Coosa, but their historic range included the Coosa River and/or its tributaries within the Lower Coosa River Basin are denoted with (hist).

Source: U.S. Fish and Wildlife Service, Daphne Ecological Services Field Office. Daphne, Alabama. Alabama's Federally Listed Species. Updated January 30, 2004. www.daphne.fws.gov/es/specieslst.htm

Fine-Lined Pocketbook. Listed in the *Federal Register* as threatened in 1993, the fine-lined pocketbook is a medium-sized mussel, sub-oval in shape, and rarely exceeds four inches in length. The ventral margin of the shell is angled posteriorly in females, resulting in a pointed posterior margin. The outer surface is yellow-brown to blackish and has fine rays on the posterior half. The interior surface is white, becoming iridescent posteriorly. The fine-lined pocketbook has been historically recorded from the Alabama River drainage, Cahaba River drainage, the Black Warrior River drainage, the Tombigbee River drainage, and the Etowah and Conasauga rivers in Georgia. Known populations within the Lower Coosa River Basin are found in Yellowleaf Creek and its tributary Muddy Prong in Shelby County and in the Tallaseehatchee Creek in Talladega County. The reasons for its current status as a federal threatened species and its recovery objectives are the same as those listed for the Alabama moccasinshell. [1]

Figure 65:
Fine-lined Pocketbook Mussel

Source: Gary Peeples, U.S. Fish and Wildlife Service, www.forestryimages.org

Lacy Elimia. Listed in the *Federal Register* as endangered in 1998, the lacy elimia is a snail that grows to about 0.4 inches in length. It has a cone-shaped, strongly striate (grooved) shell that is often folded in the upper whorls. The shell color is dark brown to black and often purple in the aperature and without banding. The aperature is small and ovate. The lacy elimia was historically abundant in the Coosa River main stem from St. Clair to Chilton County and was also known in several tributaries to the Coosa River. Currently it survives in three Coosa River tributaries, one of which is in the Lower Coosa River Basin – the Weewoka Creek in Talladega County. The *Federal Register* states that the reason for its current status is that much of the former range of the lacy elimia in the Coosa River has been inundated by dam construction. Many tributary populations apparently eliminated by historic pollution episodes. The surviving populations are threatened by sediments and nutrients from non-point source pollution. Recovery objectives and criteria were not yet determined in the *Recovery Plan*.[1]

Painted Rocksnail. Listed in the *Federal Register* as endangered in 1998, the painted rocksnail is a small to medium snail about 0.8 inches in length and oval in shape. The aperture is broadly ovate and rounded anteriorly. Coloration varies from yellowish to olive-brown, and usually with four dark bands. Historically, the painted rocksnail had the largest range of any rocksnail in the Mobile River Basin. It was locally known from the Coosa River and tributaries from the northeastern corner of St. Clair County downstream into the mainstem of the Alabama River to Claiborne, Monroe County, and the Cahaba River below the Fall Line in Perry and Dallas Counties. It is currently known from the lower reaches of three Coosa River tributaries--Choccolocco Creek in Talladega County, Buxahatchee Creek in Shelby County, and Ohatchee Creek in Calhoun County. Only Buxahatchee Creek is in the Lower Coosa River Basin. The snail may be locally common in small portions of these streams. Rocksnails are found attached to cobble, gravel, or other hard substrates in the strong currents of rapids and shoals. The *Federal Register* states that the reason for its current status is that much of the former range of the lacy elimia in the Coosa River has been inundated by dam construction. Many tributary populations apparently eliminated by historic pollution episodes. The surviving populations are threatened by sediments and nutrients from non-point source pollution. Recovery objectives and criteria were not yet determined in the *Recovery Plan*.[1]

Tulotoma Snail. Listed in the *Federal Register* as endangered in 1991, the tulatoma snail is a gill-breathing snail with a globular (spherical) shell, reaching a size somewhat larger than a golf ball, and typically ornamented with spiral lines of knob-like structures. Adult size and ornamentation distinguish it from all other freshwater snails in the Coosa-Alabama River system. The tulotoma is also distinguished by its oblique aperture with a concave margin. Historically, the tulotoma snail was known in the Coosa River and its tributaries from St. Clair County to the Alabama River in Clarke and Monroe Counties. In the Lower Coosa River Basin, current populations are found in the Coosa River below Jordan Dam in Elmore County, in Weogufka and Hatchet Creeks in Coosa and Talladega Counties and in Yellowleaf Creek in Shelby County. Results of a three-year study by the Alabama Power Company indicate that the tulotoma may number in the millions within a six-mile reach of the Coosa River below Jordan Dam. Populations are extremely restricted, but relatively abundant, in Kelley, Weogufka, Hatchet, and Choccolocco Creeks. Only a few individuals have been observed in Ohatchee and Yellowleaf Creeks. Tulotoma snails are found under large rocks in shoals and runs with moderate to swift currents.[1]

Figure 66: Tulotoma Snail

Source: Auburn University Department of Fisheries and Allied Aquacultures, Peaks of Excellence Program. http://www.ag.auburn.edu/fisheries/peak//tulotoma/index.html

Extensive impoundment of the Coosa-Alabama River System for navigation and hydropower, industrial and urban discharges, and agricultural runoff are the reasons for the tulotoma's current endangered status. Surviving populations are threatened by urban, household, and agricultural runoff, and industrial and sewage treatment plant discharges. The immediate recovery objective for the tulotoma snail is to reclassify the species from endangered to threatened status. The estimated date for reclassification was 2002. Delisting will be considered when four of the known tributary populations (Kelley, Weogufka, Hatchet, and Choccolocco Creeks) are shown to be stable or increasing, and plans are developed and implemented to improve and monitor water and habitat quality in those stream drainages. The estimated date for delisting is 2010.[1]

Blue Shiner. The blue shiner is not covered under the *Recovery Plan for the Mobile River Basin Aquatic Ecosystem*, but was covered instead under its own recovery plan prepared by U.S. Fish and Wildlife in 1995 after receiving a federal designation as threatened in April 1992. The blue shiner is a medium-sized minnow that grows to about four inches in total length. Males are larger than females. Nonbreeding males and females are dusky blue with pale yellow fins. The scales are diamond-shaped and outlined with melanophores. The lateral line is distinct. Breeding males develop nuptial tubercles, a yellowish tint in the fins, and a metallic blue sheen on the body. Females lack tubercles or breeding colors.[6]

The historic range of the blue shiner included two major rivers within the Mobile Basin, the Cahaba and Coosa. At present, this minnow is thought to be represented by six populations in the Coosa River system in Northeast Alabama, Northwest Georgia, and Southeast Tennessee. The Alabama range for this species is Weogufka Creek in Coosa County, Choccolocco Creek, and the lower reach of Shoal Creek, a tributary in Calhoun County, and Little River in Cherokee County. The blue shiner was historically known from a 60-mile reach of the Cahaba River, extending from Jefferson County to Bibb County. It was last collected in the Cahaba in 1971, and may be extirpated from that system. It has not been seen in Big Wills Creek, a tributary of the upper Coosa River in DeKalb County since 1958.[6]

Figure 67: Blue Shiner

Source: Threatened and Endangered Species of Alabama: A Guide to Assist with Forestry Activities. Rhett Johnson, Director, Solon Dixon Forestry Education Center, Auburn University and Brett Wehrle, Fish and Wildlife Biologist, U.S. Fish & Wildlife Service, Daphne, Alabama. Most Recently Revised February 18, 2004. http://www.pfmt.org/wildlife/endangered

The blue shiner primarily occupies second to fourth order, moderate gradient streams within the Ridge and Valley and Piedmont physiographic provinces of Alabama, Georgia, and Tennessee. Most watersheds where it is found are predominately forested, and agriculture and urban development are minimal, as is the case with the Weogufka watershed in the Lower Coosa River Basin which is primarily forested with the lowermost portion managed by the Kimberly Clark Corporation.[6]

The exact causes of blue shiner declines are unknown, however, there is strong circumstantial evidence to suggest that water quality degradation was a major factor. Reductions in water quality, e.g. nutrification and probable low dissolved oxygen levels, coincided with extirpation of the blue shiner and other aquatic species from the Cahaba River. In watersheds where nutrification is not a problem, excessive turbidity may be the major problem. Blue shiner survival may require high water clarity because of its possible effects on feeding and reproduction. The blue shiner's range has been reduced and fragmented by construction of dams, loss of habitat, and/or water pollution. Isolated populations are especially vulnerable to habitat degradation and decreased genetic diversity. Any event that adversely affects an isolated population has the potential to eliminate it.[6] The *Blue Shiner Recovery Plan* states that recovery may be best achieved through reduction of threats and increasing our knowledge about the blue shiner's habitat requirements and that watershed protection is an essential component of threat reduction and recovery cannot be achieved without it.[6]

There are six additional species found in the Lower Coosa River Basin that are included in Alabama's Federally Listed Species. These species are the Alabama canebrake pitcher plant, bald eagle, gray bat, Indiana bat, wood stork, and the red-cockaded woodpecker. While their dependence upon a well-managed environment should be recognized, they are not true aquatic species. Therefore, only the Alabama canebrake pitcherplant is discussed briefly at the end of this chapter. Information on the other species is available in Appendix A.

Critical Habitat. On July 1, 2004, the *Federal Register* published *50 CFR Part 17: Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for Three Threatened Mussels and Eight Endangered Mussels in the Mobile River Basin; Final Rule*. This document designates critical habitat for the 11 threatened or endangered mussels found in the Mobile River basin. Section 17.95 of the Final Rule states that the primary constituent elements essential for the conservation of the 11 Mobile River Basin mussel species are those habitat components that support feeding, sheltering, reproduction, and physical features for maintaining the natural processes that support these habitat components. The primary constituent elements include:

(i) Geomorphically stable stream and river channels and banks;
(ii) A flow regime (*i.e.*, the magnitude, frequency, duration, and seasonality of discharge over time) necessary for normal behavior, growth, and survival of all life stages of mussels and their fish hosts in the river environment;
(iii) Water quality, including temperature, pH, hardness, turbidity, oxygen content, and other chemical characteristics, necessary for normal behavior, growth, and viability of all life stages;
(iv) Sand, gravel, and/or cobble substrates with low to moderate amounts of fine sediment, low amounts of attached filamentous algae, and other physical and chemical characteristics necessary for normal behavior, growth, and viability of all life stages;
(v) Fish hosts, with adequate living, foraging, and spawning areas for them; and
(vi) Few or no competitive nonnative species present.[7]

Three critical habitats were designated within the Lower Coosa River Basin. These include Hatchet Creek, Yellowleaf Creek, and the Lower Coosa River. The Hatchet Creek area, Unit 19 in the Final Rule, includes portions of Coosa and Clay Counties. It is a critical habitat unit for the southern acornshell, ovate clubshell, southern clubshell, upland combshell, triangular kidneyshell, Coosa moccasinshell, southern pigtoe, and fine-lined pocketbook. Unit 19 includes the main stem of Hatchet Creek from the confluence of Swamp Creek at Coosa County Road 29 in Coosa County, upstream to Clay County Road 4 in Clay County.[7]

Unit 23 of the Final Rule includes Yellowleaf Creek and Mud Creek in Shelby County. This is a critical habitat unit for the triangular kidneyshell, Coosa moccasinshell, southern pigtoe, and fine-lined pocketbook. Unit 23 includes the Yellowleaf Creek main stem from Alabama Highway 25 upstream to Shelby County Road 49; and the Muddy Prong main stem extending from its confluence with Yellowleaf Creek upstream to U.S. Highway 280 in Shelby County.[7]

Unit 26 is the Lower Coosa River in Elmore County, Alabama. This is a critical habitat unit for the southern acornshell, ovate clubshell, southern clubshell, upland combshell, triangular kidneyshell, Alabama moccasinshell, Coosa moccasinshell, southern pigtoe, and fine-lined pocketbook. Unit 26 includes the Coosa River main stem from Alabama State Highway 111 bridge, upstream to Jordan Dam in Elmore County.[7]

ACT-ACF Inventory. In January 1997, a document entitled *Protected Species Inventory and Identification in the Alabama-Coosa-Tallapoosa and Apalachicola-Chattahoochee-Flint River Basins,* (ACT-ACF Inventory) was produced by the U.S. Fish and Wildlife Service, Division of Ecological Services in the Panama City, Florida and submitted to the Technical Coordination Group of the ACT-ACF Comprehensive Study. The document consists of two volumes, with Volume I being a summary report and appendices itemizing each species in the vertebrate and invertebrate categories and the Volume II itemizing species in the plant category. The summary of concerns for the threatened and endangered species is drawn from these documents. Because these documents are so comprehensive, the description, distribution, habitat description and other information for each individual species will not be repeated here. Instead, this information has been pulled from the original documents and is included as Appendix A of this plan. In addition to the federally listed species, the ACT-ACF Inventory provides a much more inclusive list of state-protected species and species of concern. These species are listed in Figure 68.

According to the ACT-ACF Inventory, the three most frequently cited concerns are habitat loss, impoundments and declining water quality. Most of the species have been adversely affected by habitat loss or habitat degradation to some extent. Although a general term, habitat loss is an appropriate label for the impacts of a broad range of human activities. Wetlands drainage, road construction, and conversion of native forest communities to urban, agricultural, and intensive silvicultural land uses, are among the most frequently cited causes of continuing habitat loss.[8] New impoundments (the number two concern) would have the greatest impact on aquatic invertebrates. The impacts of impoundments on river-adapted species include suffocation and loss of habitat by accumulating sediments; alteration of physical and chemical water properties upstream and downstream of dams; alteration of natural flow regimens downstream of dams; population fragmentation; and local extirpation of many fishes, mussels, snails, insects, crustaceans, and plants.[8] Declining water quality is the third-most prevalent concern for protected species. The most frequently mentioned aspects of water quality are sedimentation, increased nutrients and turbidity. Sedimentation affects benthic species (bottom dwellers) by deposition and suffocation, and degradation or elimination of benthic habitats. It also affects fish that must spawn in relatively sediment-free rock or gravel substrates, such as the blue shiner. Nutrient loading results in reduced or fluctuating dissolved oxygen levels, which are detrimental to most aquatic species and lead to population declines.[8]

For both vertebrate and invertebrate protected animals, contaminants are an additional concern. Several of the vertebrates are predators that accumulate in their tissues not only the contaminants to which they are directly exposed, but also the contaminants to which their prey, and their prey's prey, have been exposed. The egg-shell thinning effect of the pesticide DDT on the bald eagle and other birds of prey was a well-publicized example of bioaccumulation in the food chain. For aquatic species, heavy metals, pesticides, and acid mine drainage are generally recognized as threats. Specific data about the toxicity of most contaminants is not available for most protected species.[8]

A somewhat different set of concerns applies to the protected plant species. The most commonly cited concerns include the following:

- Altering hydrology, which includes wetland draining, changing moisture content in soils, and seasonal flooding;
- Pine plantations/forestry practices;
- Fire suppression;
- More impoundments/inundation;
- General development; and
- Competition from exotic species.[8]

Changes in soil hydrology have affected about one-fourth of the protected plant species. Activities that bring about such changes include urban development, site preparation for pine plantations, road construction and clear cutting. Upland plants out-compete wetland plants when wetlands are drained. In river flood plains, seasonal inundation prevents the intrusion of upland plants and deposits nutrient-bearing sediments. Where dams have significantly altered the patterns of seasonal flooding, floodplain species have been affected.[8]

Fire plays an important role in maintaining certain habitats. While most special-status plants are herbaceous and adapted to relatively open habitats, some are known to actually require fire to complete their life cycle. Lacking periodic fire, various woody species eventually displace the fire-adapted herbaceous species. Although many of the protected plants thrive in moist conditions and may survive or even require seasonal inundation, only a few are strictly aquatic species. Therefore, new reservoir development at locations where the protected plants occur would shift their habitat to higher elevations or eliminate it altogether.[8]

Of the protected species included in the U.S. FWS Inventory and Identification documents (Figure 68), only three have federal endangered status: the red-cockaded woodpecker, the Coosa moccasinshell, and the Alabama canebrake pitcherplant. The Coosa moccasinshell is included in the *Recovery Plan for the Mobile River Basin Aquatic Ecosystem*, however, the *Recovery Plan* does not list any known populations in the Lower Coosa River Basin. A description of the Coosa moccasinshell is included in Appendix A.

The red-cockaded woodpecker, which was listed as a federally endangered species in 1970, depends on 80 to 100-year old long-leaf pine trees with the red heart fungus in order to excavate breeding cavities. The red-cockaded woodpecker breeds in several locations within the Lower Hatchet Creek watershed.[9] Population declines are due to loss of mature, frequently burned pine forest, which is the necessary habitat. Various water management alternatives should have little to no effect on red-cockaded woodpeckers. They are found in upland habitats not directly ecologically associated with river corridors.[8]

Figure 68:

Protected Species in the Lower Coosa River Basin		
Vertebrates		
Common Name	**Scientific Name**	**Distribution in Lower Coosa River**
Crystal Darter	*Crystallaria asprella*	Elmore County, below Jordan Dam
Blue Sucker	*Cycleptus elongates*	Riverine habitat throughout basin
Blue Shiner	*Cyprimella caerulea*	Weogufka Creek
Coldwater Darter	*Etheostoma ditrema*	(1) Spring-dwelling race-Shelby to Coosa Counties (2) Stream race-Waxahatchee Creek tribs, Shelby County; Coosa River tribs, Coosa County
Coal Darter	*Percina brevicauda*	Coosa River and Hatchet Creek
Dusky Gopher Frog	*Rana capito sevosa*	Shelby County
Alligator Snapping Turtle	*Macroclemys temminckii*	Throughout basin
Northern Pine Snake	*Pituophis melanoleucus*	Throughout basin
Eastern Box Turtle	*Terrapene carolina*	Throughout basin, esp. forested floodplains
Cooper's Hawk	*Accipiter cooperii*	Throughout basin
Bachman's Sparrow	*Aimophila aestivalis*	Coastal Plain and Piedmont province
Common Ground Dove	*Columbina passerine*	Coastal Plain province, rare above Fall Line
Southeastern American Kestrel	*Falco sparverius paulus*	Throughout basin
Bald Eagle	*Haliaeetus leucocephalus*	Coastal Plain and Piedmont province
Black Rail	*Laterallus jamaicensis*	Throughout basin, county data not available
Red-cockaded Woodpecker	*Picoides borealis*	Coastal Plain province
Appalachian Bewick's wren	*Thryomanes bewickii altus*	North of the Fall Line, particularly in Ridge and Valley province
Southeastern Pocket Gopher	*Geomys pinetis*	Coastal Plain province
Southeastern Weasel	*Mustela frenata olivacea*	Throughout basin, county data not available
Southeastern Myotis	*Myotis austroriparius*	Throughout basin
Rafinesque's Big-eared Bat	*Plecotus rafinesquii*	Throughout basin
Brazilian Free-tailed Bat	*Tadarida brasiliensis*	Throughout basin, county data not available
Meadow Jumping Mouse	*Zapus hudsonius*	Chilton, Coosa and Elmore Counties
Source: Protected Species Inventory and Identification in the Alabama-Coosa-Tallapoosa and Apalachicola-Chattahoochee-Flint River Basins. Volume I Summary Report, Appendices A-C. Report to the Technical Coordination Group of the ACT-ACF Comprehensive Study. Prepared by U.S. Fish and Wildlife Service, Division of Ecological Services, Panama City, Florida. Gail A. Carmody, Project Leader; John W. Kasbohm, Biologist; Brian K. Luprek, Biologist; Jerry W. Ziewitz, Biologist. January 1997.		

Figure 68, continued:

Protected Species in the Lower Coosa River Basin		
Invertebrates		
Common Name	**Scientific Name**	**Distribution in Lower Coosa River**
Fine-lined Pocketbook	*Lampsilis altilis*	Yellowleaf Creek, Shelby County; Tallassehatchee Creek, Talladega and Clay Counties
Alabama Moccasinshell	*Medionidus acutissimus*	Coosa River drainage
Coosa Moccasinshell	*Medionidus parvulus*	Tributaries to Coosa River
Shoal Sprite	*Amphigyra alabamensis*	Throughout basin, no county data available
Mud Elimia	*Elimia alabamensis*	Shelby, Talladega, Chilton, Coosa Counties
Walnut Elimia	*Elimia bellula*	Yellowleaf Creek, Shelby County
Lacy Elimia	*Elimia crenatella*	Weewoka Creek, Talladega County
Banded Elimia	*Elimia fascians*	Yellowleaf Creek, Shelby County
Silt Elimia	*Elimia haysiana*	Below Jordan Dam, Elmore County
Round Rocksnail	*Leptoxis ampla*	Near Wetumpka, Elmore County
Spotted Rocksnail	*Leptoxis picta*	Near Wetumpka, Elmore County
Painted Rocksnail	*Leptoxis tainiata*	Shoals near Wetumpka, Elmore County; Buxahatchee Creek, Shelby County
Cylindrical lioplax	*Lioplax cyclostomaformis*	Throughout basin
Snail	*Neoplanoribis carinatus* *Neoplanorbis smithi* *Neoplanorbis tantillus* *Neoplanorbis umbilicatus*	Endemic to the Coosa River system. All known habitat has been inundated by Lay Dam, Jordan Dam and Mitchell Dam. Presumed extinct.
Rough Hornsnail	*Pleurocera foremani*	Throughout basin. May be extinct.
Upland Hornsnail	*Pleurocera showalteri*	Shelby and Talladega Counties
Wicker ancylid	*Rhodacme filosa*	Throughout basin, county data not available.
Golden Pebblesnail	*Somoatogyrus aureaus*	Yellowleaf Creek, Shelby County
Knotty Pebblesnail	*Smoatogyrus constrictus*	Wetumpka, Elmore County; Wilsonville, Shelby County. May be extinct.
Coosa Pebblesnail	*Somatogyrus coosaensis*	Throughout basin
Stocky Pebblesnail	*Somatogyrus crassus*	Main stem in Elmore, Chilton, Coosa Counties. May be extinct.
Hidden Pebblesnail	*Somatogyrus decipiens*	Chilton, Coosa Counties. May be extinct.
Fluted Pebblesnail	*Somatogyrus hendersoni*	Main stem, Coosa, Chilton Counties. May be extinct.
Granite Pebblesnail	*Somatogyrus hinkleyi*	Wetumpka, Elmore County; Wilsonville, Shelby County.
Dwarf Pebblesnail	*Somatogyrus nanus*	Main stem throughout basin. Weogufka Creek, Elmore County.
Moon Pebblesnail	*Somatogyrus obtusus*	Chilton-Coosa County shoals
Pygmy Pebblesnail	*Somatogyrus pygmaeus*	Chilton County. May be extinct.
Quadrate Pebblesnail	*Somoatogyrus quadratus*	Coosa River. County data not available.
Tulotoma Snail	*Tulotoma magnifica*	Near Wetumpka, Elmore County; Weogufka Creek, Hatchett Creek, Coosa County.
Cobblestone Tiger Beetle	*Cicindela marginipennis*	Near Wetumpka, Elmore County
Sixbanded Longhorn Beetle	*Dryobis sexnotatus*	Throughout basin, county data not available
Source: Protected Species Inventory and Identification in the Alabama-Coosa-Tallapoosa and Apalachicola-Chattahoochee-Flint River Basins. Volume I Summary Report, Appendices A-C. Report to the Technical Coordination Group of the ACT-ACF Comprehensive Study. Prepared by U.S. Fish and Wildlife Service, Division of Ecological Services, Panama City, Florida. Gail A. Carmody, Project Leader; John W. Kasbohm, Biologist; Brian K. Luprek, Biologist; Jerry W. Ziewitz, Biologist. January 1997.		

Figure 68, Continued:

Protected Species in the Lower Coosa River Basin		
Plants		
Common Name	**Scientific Name**	**Distribution in Lower Coosa River**
Price's Potatoe-bean	*Apios priceana*	Autauga County
Georgia Rock-cress	*Arabis georgiana*	Elmore County
Shoals Spiderlily	*Hymenoccallis coronaria*	Shelby County
Running Post Oak	*Quercus boyntonii*	Ridge and Valley Province of Shelby County
Pinnate-lobed Coneflower	*Rudbeckia triloba*	Autauga County
Alabama Canebrake Pitcherplant	*Sarracenia rubra*	Autauga, Chilton, Elmore Counties
Nevius Stonecrop	*Sedum nevii*	Chilton, Coosa, Talladega Counties
Horse-nettle	*Solanum carolinense* var. *hirsutum*	Chilton, Coosa Counties
Pickering Morning-glory	*Stylisma pickeringii*	Autauga County
Roundleaf Meadowrue	*Thalictrum subrotundum*	Autauga, Clay Counties
Source: Protected Species Inventory and Identification in the Alabama-Coosa-Tallapoosa and Apalachicola-Chattahoochee-Flint River Basins. Volume II Summary Report, Appendix D. Report to the Technical Coordination Group of the ACT-ACF Comprehensive Study. Prepared by U.S. Fish and Wildlife Service, Division of Ecological Services, Panama City, Florida. Gail A. Carmody, Project Leader; John W. Kasbohm, Biologist; Brian K. Luprek, Biologist; Jerry W. Ziewitz, Biologist. January 1997.		

While the Alabama canebrake pitcher plant is not necessarily an aquatic species, its habitat includes sandy and gravelly bogs and in swamps. Like all pitcher plants, the Alabama canebrake pitcher plant is carnivorous, trapping and digesting insects in its tubular leaf. The tube of the Alabama canebrake pitcher plant is 8 to 16 inches tall in the spring and may be curved in shaded conditions. The flower is maroon and droops from a two- foot stalk. The flower appears in April through June. The summer leaves are also tubular and may be up to 27 inches long. They are light green and covered with white hair. The plant grows in wet areas and seeps along with grasses, sedges, sweetbay, poison sumac, bayberry, and sparkleberry.[9] It grows best in open areas where it is exposed to light and is found in the upper Coastal Plain in Autauga, Chilton and Elmore Counties. This species was listed as endangered in the Federal Register in 1989. Concerns include any modification or disturbance to the habitat, such as pond building, agricultural development, herbicide use, and drainage of site. Suppression of fire in existing population localities is also a threat because the encroachment of woody species or aggressive exotics will eventually eliminate the Alabama canebrake pitcher plant. Many populations are which pastures where cattle cause soil compaction and eutrophication of habitat.[8]

Figure 69:

Alabama canebrake pitcher plant

Source: Threatened and Endangered Species of Alabama: A Guide to Assist with Forestry Activities. http://www.pfmt.org/wildlife

Source Documents:

1. U.S. Fish and Wildlife Service. *Mobile River Basin Aquatic Ecosystem Recovery Plan*. Atlanta, Georgia. 128 pp.

2. U.S. Fish and Wildlife Service. Daphne Ecological Services Field Office. Daphne, Alabama. *Alabama's Federally Listed Species.* January 30, 2004. www.daphne.fws.gov/es/specieslst.htm

3. U.S. Fish and Wildlife Service. Daphne Ecological Services Field Office. Daphne, Alabama. *Ecosystems.* http://daphne.fws.gov/ecosystem/ecosystem.htm

4. U.S. Environmental Protection Agency. Primary Distinguishing Characteristics of Level III Ecoregions of the Continental United States. Draft, April 2002. ftp://ftp.epa.gov/wed/ecoregions/us/useco_desc.doc

5. David B. Guralnik, Editor in Chief, Webster's New World Dictionary of the American Language. 1982.

6. U.S. Fish and Wildlife Service. *Blue Shiner (Cyprinella caerulea) Recovery Plan*. Jackson, Mississippi. 1995. http://ecos.fws.gov/tess_public/TESSWebpage

7. *Federal Register.* Vol. 69, No. 126. Rules and Regulations. *50 CFR Part 17: Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for Three Threatened Mussels and Eight Endangered Mussels in the Mobile River Basin; Final Rule.*

8. Jerry W. Ziewitz, Brian K. Luprek and John W. Kasbohm. Protected Species Inventory and Identification in the Alabama-Coosa-Tallapoosa and Apalachicola-Chattahoochee-Flint River Basins. Volume I. U.S. Fish and Wildlife Service, Division of Ecological Services, Panama City, Florida. January 1997.

9. Alabama Rivers Alliance. *Hatchet Creek Ecological Baseline*. William W. Duncan, Bradford T. McLane, Beth Wentzel, Jessica L. Ulrich and Justin S. Ellis. April 2001.

10. Rhett Johnson, Director, Solon Dixon Forestry Education Center, Auburn University and Brett Wehrle, Fish and Wildlife Biologist, U.S. Fish & Wildlife Service, Daphne, Alabama. *Threatened and Endangered Species of Alabama: A Guide to Assist with Forestry Activities*. Most Recently Revised February 18, 2004. http://www.pfmt.org/wildlife/endangered

Chapter 5
Land Use

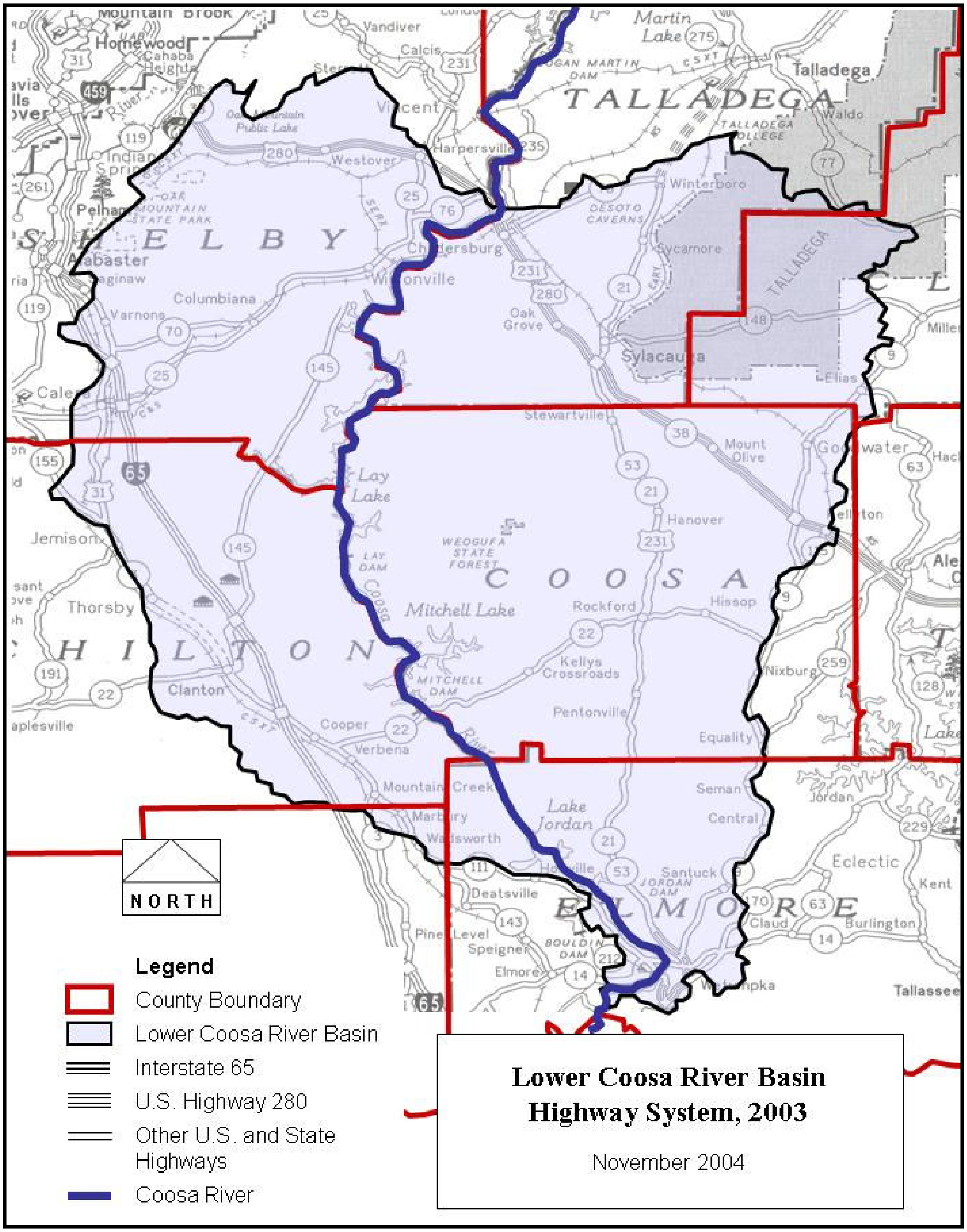
Land and land use can be examined from more than one perspective, the first of which is how the land is currently being used and the second, a perspective including the land's capacity for future uses. There are many factors affecting why development has or has not occurred in the Lower Coosa River Basin, including the physical characteristics and capacity of the land as discussed in Chapter 2 of this plan. Factors that are paramount in the continued development of the basin, and management of that development, is the expected population and economic growth of the area as discussed in Chapter 3 and those features that might be preserved and/or protected, including historical features, prime farmland, natural forests and endangered species, all of which have been discussed in an earlier chapter. Other factors include accessibility and available infrastructure. This chapter examines vehicular accessibility through and around the basin area and existing land use, both basin-wide and at the watershed level, with some references to expected growth and development. The basin's capacity for future growth and development and specific features that might be safeguarded are addressed at the watershed level in Part IV of this plan and in the supplemental document, *Atlas of Watersheds*.

Accessibility

Primary access to the Lower Coosa River Basin area is provided via Interstate 65, which runs in a northwesterly direction between Montgomery and Birmingham along the western boundary of the basin. Interstate 65 provides direct access to Clanton, Thorsby, and Jemison in Chilton County and to Calera in Shelby County. Other primary access routes include US Highway 280, which runs in a southeasterly direction between Birmingham and Auburn; US Highway 231, which runs north-south in the eastern part of the basin between Wetumpka and Sylacauga; and US Highway 31, which runs almost parallel to Interstate 65 between Montgomery and Birmingham. US Highway 280 is a four-lane divided highway, while US Highways 31 and 231 are two-lane highways.

Secondary access is provided via a system of eight State highways. Four are north-south state highways, including Alabama Highway 9, between Wetumpka and Heflin; Alabama Highway 21, between Wetumpka and Anniston; Alabama Highway 25, between Centreville and Ashville; and, Alabama Highway 145, between Clanton and Childersburg. The four east-west state highways include Alabama Highway 22, between Maplesville and Roanoke; Alabama Highway 70, between Interstate 65 and Columbiana; Alabama Highway 76, between Wilsonville and Winterboro; and Alabama Highway 148, between Sylacauga and Millerville.

Figure 70:



Lower Coosa River Basin Highway System, 2003

November 2004

Source: Alabama Department of Transportation, Official 2003 Alabama State Highway Map, State Route System and Delaney Consultant Services, Inc.

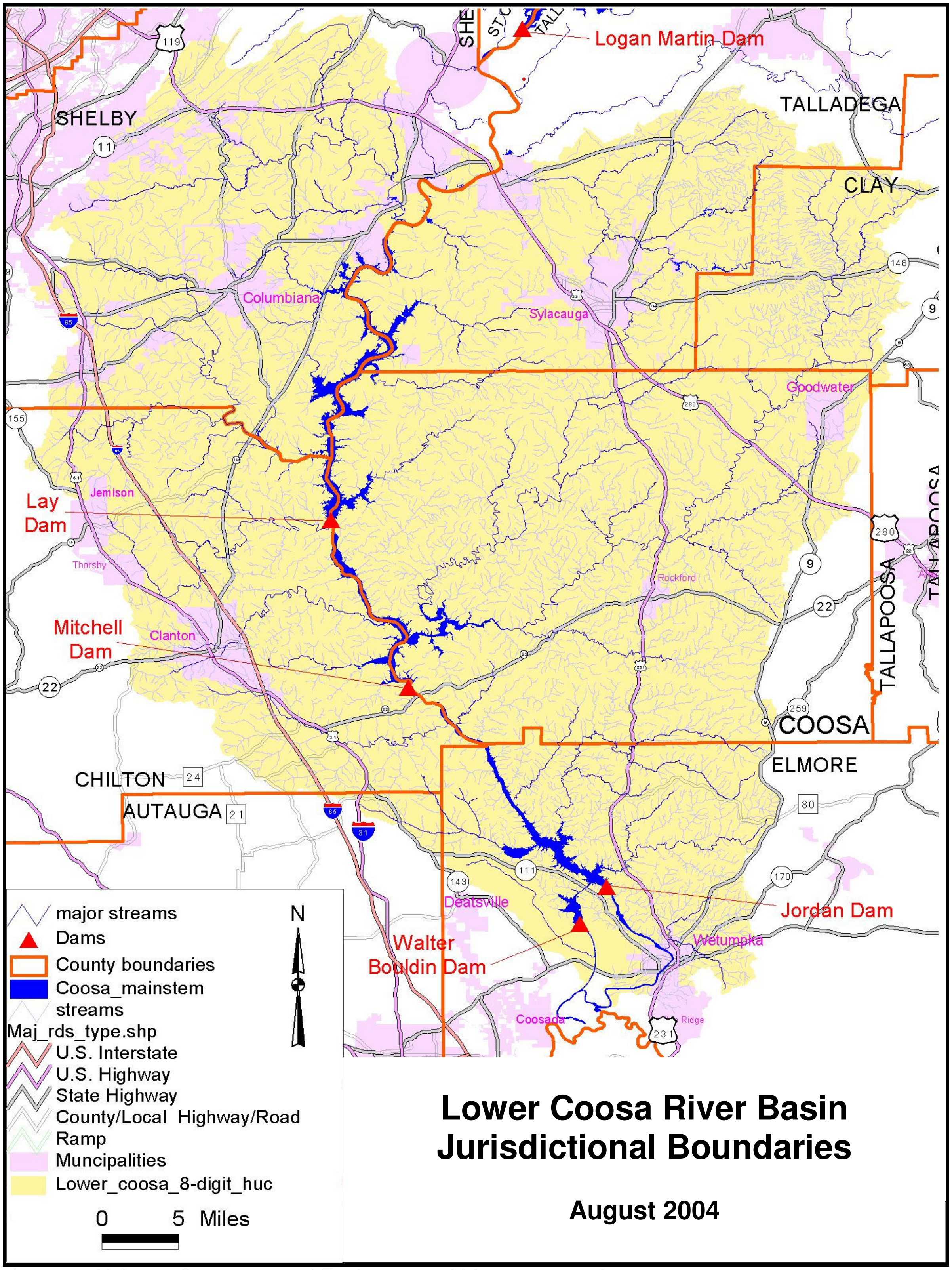
An overlay of the Lower Coosa River Basin boundaries on a state highway map shows that while north-south access is adequate through the basin, the east-west access is extremely limited, resulting in only two locations within the basin to cross the Coosa River via a state highway. Although there are an equal number of state highways providing access both north-south and east-west, the north-south routes are longer and are located on both sides of the Coosa River. With the exception of Alabama Highway 22, all of the east-west state highways are located in the northern part of the basin in Shelby and Talladega Counties. The result is a large portion of the central part of the basin is only accessible by a system of county roads.

The lack of accessibility is also evident in the location of municipalities within the basin boundaries. Of the 14 municipalities in the basin, eight are located in the two northern counties, with six in Shelby County and two in Talladega County. In the two central counties, the three municipalities in Chilton County are located along the western edge of the basin and the two municipalities in Coosa County are located along the eastern edge of the basin. In the southern part of the basin, there is only Wetumpka located at the southern tip of the basin. The map in Figure 70 shows the jurisdictional boundaries of the municipalities in the basin and a void in the central part of the basin where there is limited access and no municipalities. In Coosa County, the lack of development can be attributed to the presence of the Coosa Wildlife Management Area and the Weogufka State Forest. Just north of the Coosa Wildlife Management Area, County Road 55 provides one additional access across the Coosa River between Chilton and Coosa Counties.

Historical routes through the Lower Coosa River Basin include the Route of DeSoto in 1540, General Andrew Jackson's March Against Creeks, Pensacola Trading Path, Montgomery and Talladega Stage Road, Central Plank Road of 1851, and the Coosada Okfuskee Indian Trail. The routes of DeSoto, Jackson and the Pensacola Trading Path all follow the Coosa River from Montgomery to Georgia and Tennessee. The Montgomery and Talladega Stage Road began in Montgomery and ran northwest to southcentral Shelby County where it turned northeast to travel through Talladega and Cleburne Counties to Georgia. Central Plank road began in the Montgomery area and ran northeast through the central part of Elmore County and the eastern part of Coosa County to the Talladega area. The Coosada Okfuskee Indian Trail began in southwest Elmore County and ran northeast through Tallapoosa, Randolph and Cleburne Counties to Rome, Georgia.[1]

Growth trends of the Lower Coosa River Basin were established in the previous two chapters, with a loss of over one-fourth of the prime agricultural land in the basin to development and an average population increase of 22 percent among the counties in the basin. These growth trends are also reflected in the increased traffic volume on the state highways within the basin boundaries. The Alabama Department of Transportation (ALDOT), Bureau of Transportation Planning, maintains traffic counts at specific sites every two years indicating increases and decreases in traffic volume and also indicating future road improvement needs by following a trend analysis. These traffic counts are called the Annual Average Daily Traffic, or AADT. The terms AADT and traffic volume are used interchangeably in this section.

Figure 71:



Source: Alabama Department of Environmental Management, August, 2004

Figure 72:

Change in Traffic Volume in Lower Coosa River Basin, 1994 to 2002					
Route	**Location**	**1994**	**2002**	**Number Change 1994-2002**	**Percent Change 1994-2002**
Interstate 65	South of Exit 238	39,300	51,000	11,700	29.77%
	Between Exits 231 and 229	28,530	36,450	7,920	27.76%
	South of Chilton-Shelby County Line	27,770	35,610	7,840	28.23%
	Near Exit 219	26,250	34,050	7,800	29.71%
	South of Exit 212	25,540	32,450	6,910	27.06%
	North of Exit 205	25,210	31,550	6,340	25.15%
	South of Exit 205	25,420	30,950	5,530	21.75%
US Highway 31	At Varnons	6,290	7,410	1,120	17.81%
	South of I-65 Exit 231	8,660	12,110	3,450	39.84%
	South of AL Highway 25	7,010	7,700	690	9.84%
	At Cooper	5,560	5,780	220	3.96%
US Highway 231	South of US Highway 280	5,750	6,650	900	15.65%
	At Stewartville	4,790	5,100	310	6.47%
	At Hanover	2,830	3,080	250	8.83%
	North of AL Highway 22	2,880	3,060	180	6.25%
	South of AL Highway 22	1,980	2,060	80	4.04%
	North of Elmore CR 29	1,830	1,920	90	4.92%
	South of Elmore CR 29	2,720	3,050	330	12.13%
	North of Wallsboro	4,860	5,720	860	17.70%
US Highway 280	At Shelby CR 43	19,610	30,210	10,600	54.05%
	At Shelby CR 55	16,010	20,180	4,170	26.05%
	At AL Highway 25	13,910	17,500	3,590	25.81%
	At Coosa River	16,270	20,710	4,440	27.29%
	South of AL Highway 76	21,510	23,290	1,780	8.28%
	North of US Highway 231	12,160	14,110	1,950	16.04%
	South of Coosa-Talladega County Line	8,330	10,790	2,460	29.53%
	South of Mount Olive	7,920	9,670	1,750	22.10%
	West of AL Highway 9	8,030	9,860	1,830	22.79%
	East of AL Highway 9	10,330	11,850	1,520	14.71%
Alabama Highway 9	At AL Highway 63	1,430	1,900	470	32.87%
	At Goodwater	4,850	4,860	10	0.21%
	North of US Highway 280	3,770	3,560	-210	-5.57%
	North of AL Highway 22	1,250	1,580	330	26.40%
	South of AL Highway 22	2,270	2,600	330	14.54%
	South of Santuck	5,630	5,610	-20	-0.36%
Alabama Highway 21	North of Winterboro	5,760	7,170	1,410	24.48%
	South of Sycamore	6,630	7,960	1,330	20.06%
	North of AL Highway 148	11,710	10,550	-1,160	-9.91%

Figure 72, continued:

Route	Location	1994	2002	Number Change 1994-2002	Percent Change 1994-2002
Alabama Highway 22	West of US Highway 31	8,670	8,670	0	0.00%
	East of US Highway 31	1,460	1,510	50	3.42%
	At Coosa River	1,190	1,380	190	15.97%
	East of Kelly's Crossroads	940	970	30	3.19%
	East of US Highway 231	1,540	1,760	220	14.29%
	West of AL Highway 9	1,620	1,730	110	6.79%
Alabama Highway 25	East of Interstate 65	3,040	3,890	850	27.96%
	Southwest of AL Highway 70	2,890	3,220	330	11.42%
	Northeast of AL Highway 70	4,470	5,280	810	18.12%
	West of Shelby CR 61	3,070	3,580	510	16.61%
	South of AL Highway 76	4,470	5,550	1,080	24.16%
	South of US Highway 280	2,560	3,110	550	21.48%
Alabama Highway 70	East of US Highway 31	3,710	6,060	2,350	63.34%
	West of AL Highway 25	9,040	10,490	1,450	16.04%
Alabama Highway 76	East of US Highway 231	6,850	6,820	-30	-0.44%
	At DeSoto Caverns	3,540	2,230	-1,310	-37.01%
	West of AL Highway 21	1,590	2,130	540	33.96%
Alabama Highway 145	Northeast of I-65	4,690	3,290	-1,400	-29.85%
	At Shelby-Chilton County Line	2,010	2,500	490	24.38%
	South of AL Highway 25	2,590	2,660	70	2.70%
Alabama Highway 148	East of AL Highway 21	3,380	3,380	0	0.00%
	At Talladega-Clay County Line	880	1,110	230	26.14%
	At Clay CR 7	770	960	190	24.68%
	West of Millerville	960	1,020	60	6.25%
Source: Alabama Department of Transportation, 1994 Alabama Traffic Flow Map and 2002 Alabama Traffic Flow Map, and Delaney Consultant Services, Inc.					

An inventory of 62 sites where traffic counts were conducted within the Lower Coosa River Basin during 1994 and 2002 indicates an average increase of 15.80 percent in traffic volume on the federal and state roads within the basin. Twelve roads were inventoried: Interstate 65, three US highways, and eight state highways. See Figure 72. Individual sites showing the greatest increase in traffic volume are as follows:

Alabama Highway 70 east of US Highway 31..................... 63.34 percent increase
US Highway 280 at Shelby CR 43 .... 54.05 percent increase
US Highway 31 south of I-65 Exit 231 .... 39.84 percent increase
Alabama Highway 76 west of Alabama Highway 21........... 33.96 percent increase
Alabama Highway 9 at Alabama Highway 63 .... 32.87 percent increase

All of the individual sites with the greatest percentage increase in annual average daily traffic volume over the eight year time period are located in the northern part of the basin in Shelby and Talladega Counties. Coincidentally, they are also all located along the edge of the basin boundaries. Those four sites which saw a decrease in traffic volume over the time period are located throughout the basin, with two in Talladega County, one in Chilton County and one in Elmore County.

Along Interstate 65, traffic volume in 2002 ranged from 30,950 to 51,000 vehicles per day, with traffic volume increases between 1994 and 2002 ranging between 21.75 percent and 29.71 percent. Interstate 65 showed the most consistent traffic volume increases along the entire length of the road that is located within the Lower Coosa River Basin.

Traffic volume along US Highway 31 is highest south of Interstate 65 Exit 231 at Calera with 12,100 vehicles per day in 2002. Traffic volume elsewhere along US Highway 31, however, is considerably less 5, 780 to 7,700 vehicles per day. US Highway 231 has the lowest traffic volume of the three federal highways found in the basin, ranging between 1,920 and 6,650 vehicles per day in 2002. Although traffic volume did increase between 1994 and 2002, the percentage of increase was considerably than in other areas of the basin, ranging between 4.04 percent and 17.70 percent. Following Interstate 65, US Highway 280 is the most heavily traveled road in the basin, with 2002 AADT ranging between 9,670 to 30,210 vehicles per day. Traffic volume increases during the eight-year period were also significant on US Highway 280, ranging between 8.28 percent and 54.05 percent. With the exception of three of ten sites, all of the traffic increases along US Highway 280 were in excess of 20 percent.

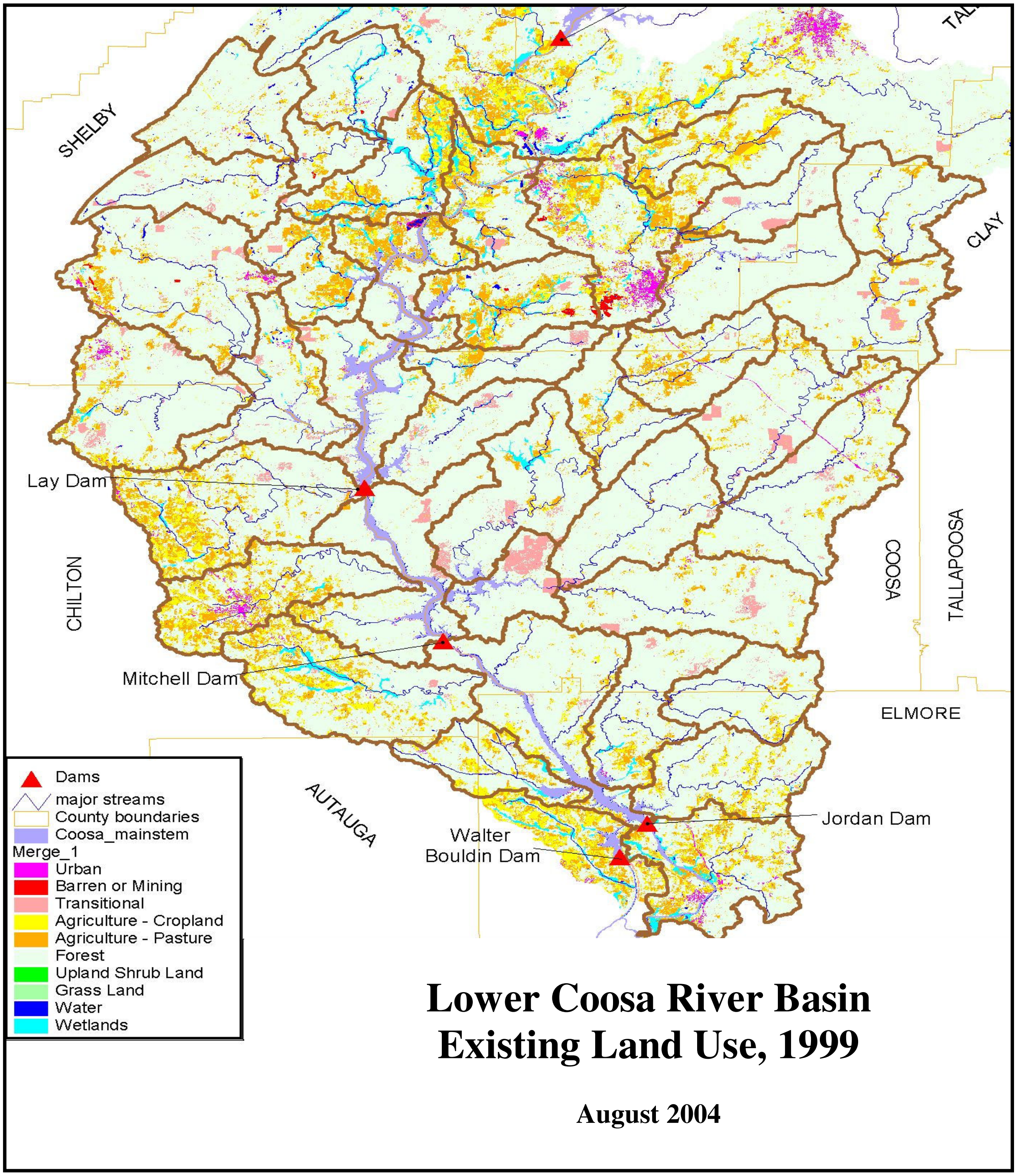
In Chapter 3, the population projections indicated an increase of 49,063 people in the Lower Coosa River Basin over the next 20 years. The resulting impact of this population growth is that there will be ever-increasing traffic volume on an already limited transportation system.

Basin Land Use

In July 1976, the *Water Quality Management Plan: Coosa River Basin* reported that approximately 73 percent of the land within the entire Coosa River basin is in a forest land-use category. The next largest category, at 22 percent, was agricultural. Open land (includes water, wetland, and barren areas) accounted for three percent of the total basin while urban land made up a mere 2 percent of the total area.[2] In April 2002, ADEM published the *Surface Water Quality Screening Assessment of the Coosa River Basin – 2000*, which reported land uses for each of the 8-digit hydrologic unit code basins in the Coosa River basin. Land use data was drawn from assessment worksheets completed by the local Soil and Water Conservation Districts in 1998. According to this data for the Lower Coosa River Basin, 78 percent of the land was forested, 13 percent was agricultural, 5 percent was urban, 2 percent was open water, and 1 percent each were mining and other land uses.[3]

A true comparison between the 1976 land use data for the entire Coosa Basin and the 1998 data for the Lower Coosa River Basin cannot be made, however, the data is closely related enough to see that land use patterns are fairly consistent throughout the basin. The majority of the land, by far, is used for forestry purposes, distantly followed by agricultural and then urban land uses.

Figure 73:



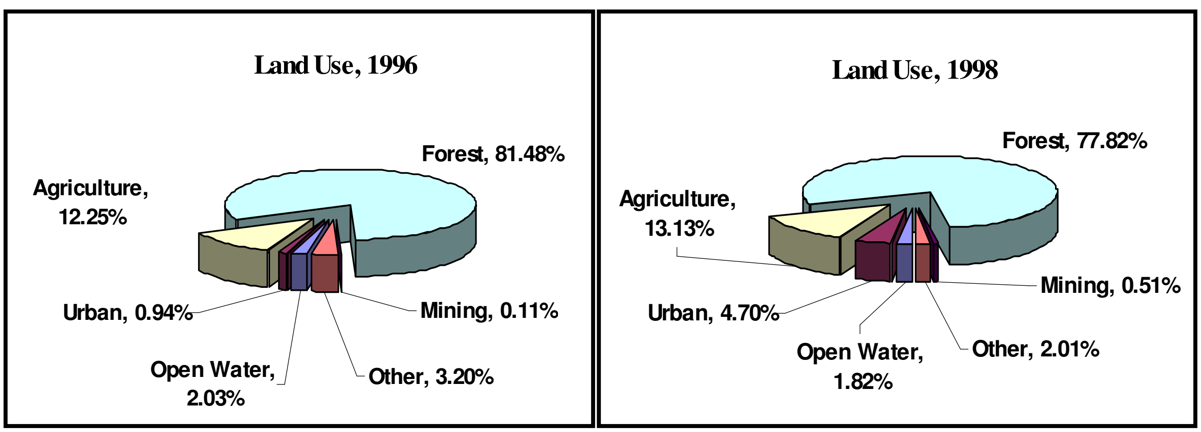
Source: Alabama Department of Environmental Management, August 2004.

To provide more land use detail at the local level, this plan provides a comparison between land satellite data from 1996 provided through the Alabama Department of Environmental Management from the U.S. Geological Survey (USGS) for each of the 20 watersheds in the basin and land use data provided by the Alabama Soil and Water Conservation Committee (SWCC) at the watershed level in 1998. A comparison of the two sources of data show some minor discrepancies, some of which may be attributed to interpretation of the aerial photographs in the land satellite data. For instance, pine seedlings of forested land can be misconstrued as row crops in an aerial shot, and vice versa. Discrepancies may also be attributed to errors in estimating land acreage at the ground level with information drawn from a number of different sources including the seven county tax assessors and/or mapping offices. The estimates are, however, close enough for either to be representative of the basin land uses for the level of accuracy needed at this point in the watershed management planning process.

A description of the land uses for the entire Lower Coosa River Basin follows with a comparison of data from both sources. For purposes beyond that initial discussion and comparison, land use data from the Soil and Water Conservation Committee will primarily be used. Information gathered from the land satellite data reports the total Lower Coosa River Basin size at 1,255,898 acres while the Soil and Water Conservation Committee data reports the total basin size at 1,250,595 (SWCC March 1985) acres. All in all, the difference in total basin size from the two sources is less than one percent.

Figure 74:

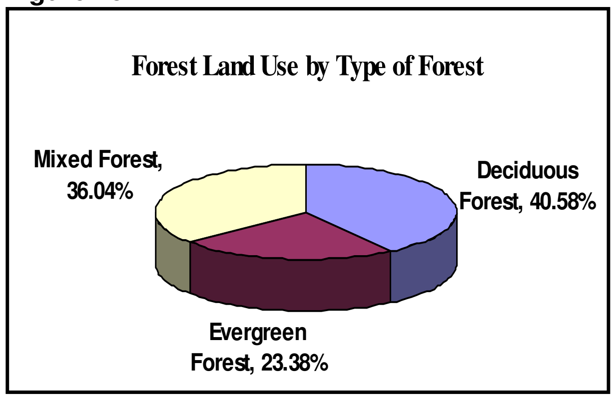
Land Use in the Lower Coosa River Basin
1996 – USGS and 1998 – SWCC



Source: Alabama Department of Environmental Management, Land Satellite Data, 1996
Alabama Soil and Water Conservation Committee, Basin Assessments, 1998.

The difference between the two sources of land use data is seen, primarily, in the amount of land that is used for forest purposes. The land satellite data reports 3.66 percent more land in forest uses than the SWCC information, however, both sources report that more than three-fourths of the basin is used for forestry. This was also the case in 1976 with the information gathered by the Alabama Water Improvement Commission. The SWCC data shows 3.76 percent more urban land use than the land satellite data, 0.88 percent more agricultural land use, and 0.40 more mining land use. The land satellite data shows 0.21 percent more open water than the SWCC data and 1.19 percent more land in the other category. The "other" land uses include bare rock, sand and clay, transitional land uses, woody wetlands and emergent herbaceous wetlands. Using the land use information from the Soil and Water Conservation Committee, the three major land uses in the Lower Coosa River Basin are forestry, agriculture and urban land uses.

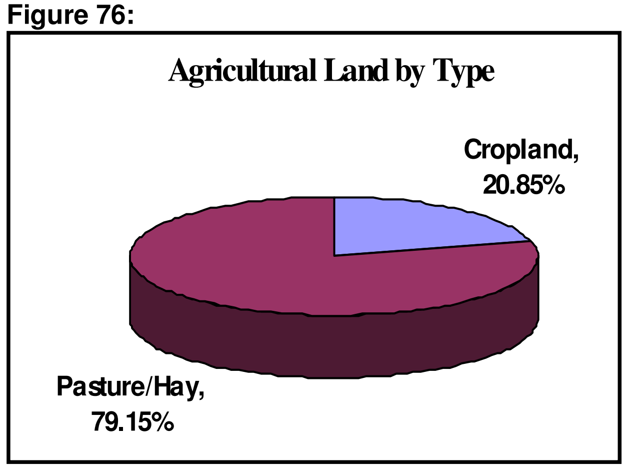
Figure 75:



Source: Alabama Department of Environmental Management, Land Satellite Data from USGS, 1996.

Using the land satellite data, the forest land use category can be divided into three types of forested land: deciduous forests, evergreen forests, and mixed forests. Generally speaking, deciduous forest are natural forests, as would be found in the Talladega National Forest. Rarely would this land be counted as land that is used for timber, or silviculture, purposes. Mixed forests are often seen as land that has not been developed, but neither is it being preserved purely for natural forest purposes. Evergreen forests, along with some mixed forests, are most often used for the purpose of silviculture, or timber production. Using this data, potentially 59.42 percent of the forest land in the basin is used for silviculture. This equates to approximately 581,596 acres or almost half of the total Lower Coosa River Basin area, at 46.50 percent. It is estimated that in 2001, cash receipts from timber production in Chilton, Coosa, Elmore, Shelby and Talladega Counties combined totaled just under $37 million.[4]

Figure 76:



Source: Alabama Soil and Water Conservation Committee, Basin Assessment. 1998.

Agricultural land uses can be divided into cropland and pasture/hay land. The distinction is relevant because of the different impacts each type has on water quality, which is discussed more in Part III of this plan. Using the SWCC data, it is estimated that 79.15 percent of the agricultural land is used for pasture and hay, which equates to approximately 130,723 acres or 10.45 percent of the total basin area. The remaining agricultural land, at 20.85 percent, is used for crop production. This equates to 34,435 acres or 2.75 percent of the total land area in the Lower Coosa River Basin. It is estimated that in 2001, cash receipts from agricultural land uses combined in the five counties of Chilton, Coosa, Elmore, Shelby and Talladega totaled approximately $66.4 million, with $31.1 million generated by crop production and 35.3 generated from livestock and poultry.[4] A review of concentrated animal feeding operation (CAFO) registrations from 2003 showed that there are no CAFOs located in the Lower Coosa River Basin.

Urban land uses, which comprise approximately 4.70 percent of the basin land area, include developed land such as industrial, commercial and residential uses along with accompanying infrastructure and recreational uses. Of the 59,140 acres in the basin categorized as urban land uses, it is estimated that 42.85 percent is used for residential purposes, 33.66 percent is used for commercial, industrial and transportation purposes, and 23.50 percent is used for urban recreational purposes, such as lawns and parks.

Land used for mining purposes constitutes 0.51 percent of the total basin area which equates to approximately 6,456 acres. There are 13 permitted mining facilities in the Lower Coosa River Basin, of which six are in Talladega County, three are in Elmore County, two are in Chilton County, and one each are in Coosa and Shelby Counties. All of these are rock quarries or sand and gravel pits.

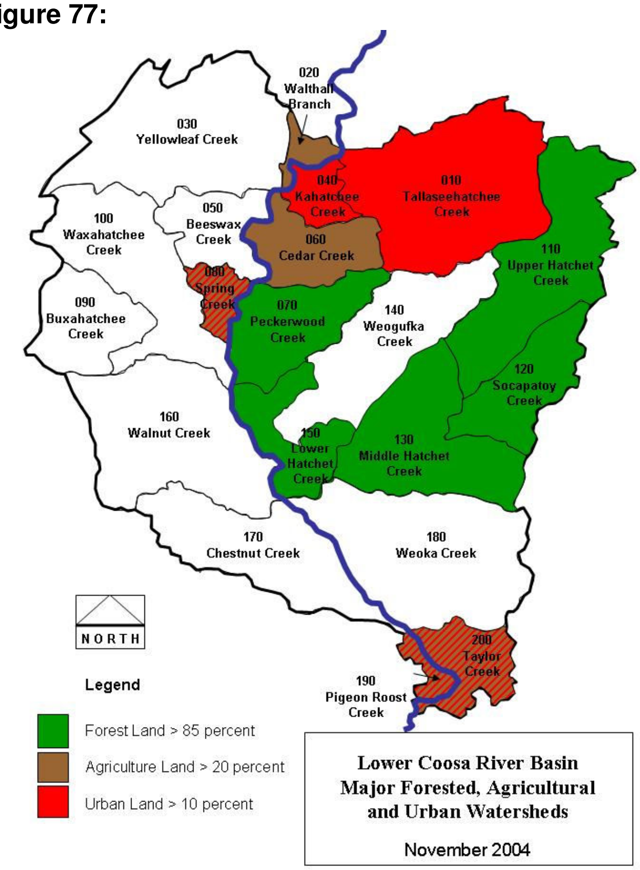
Land Use by Watershed

Those watersheds with the highest percentages of forested, agricultural and urban land are shown in Figure 77. Figure 78 provides the total acreage per watershed and the amount of acreage used for crop land, pasture land, forest land, urban land, open ponds and water, mined land, and land for other uses along with the percentage for land use each category for the particular watershed.

Note: The land use numbers in the chart have been adjusted to correct mathematical errors found in the original SWCC data. The corrected data will be utilized for land use purposes throughout the remainder of this plan.

As with the entire Lower Coosa River Basin, the predominant land use in each of the watersheds is forest land, ranging from 50 percent in the Walthall Branch watershed to 92 percent in the Middle Hatchet Creek watershed. Following the Middle Hatchet Creek watershed, the watersheds with the highest percentage of forest land are Upper Hatchet Creek at 91 percent, Socapatoy Creek at 91 percent, Lower Hatchet Creek at 89 percent, and Peckerwood Creek at 88 percent.

Figure 77:



Source: Alabama Soil and Water Conservation Committee, Basin Assessments, 1998 and Delaney Consultant Services, Inc.

Figure 78:

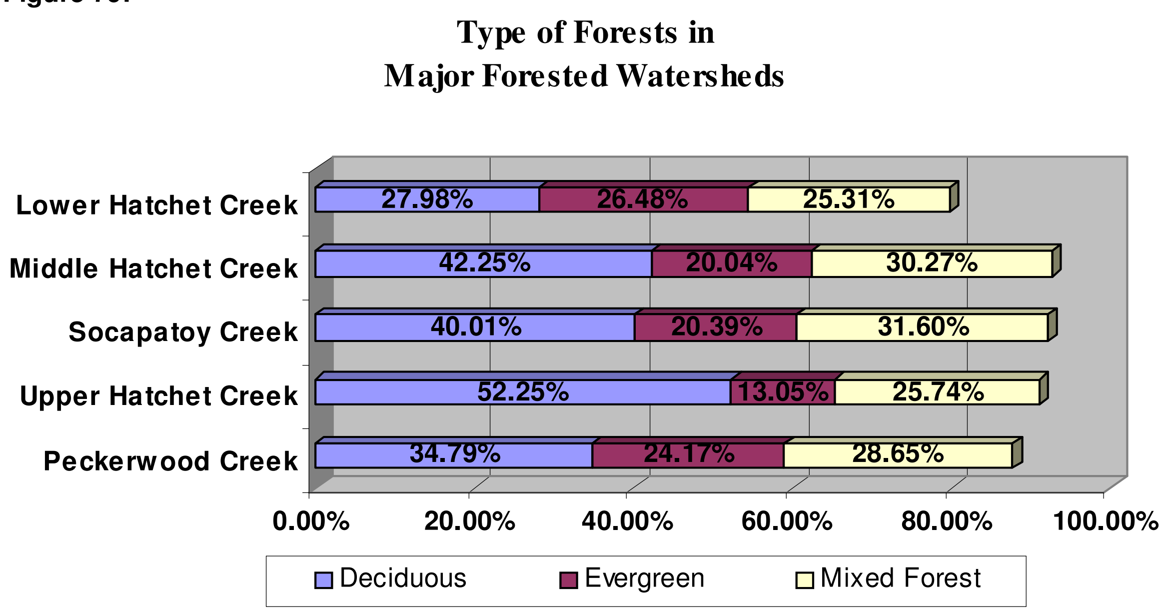
Land Use by Watershed, 1998

Watershed Name	Total Acres	Crop Land (acres) % total	Pasture Land (acres) % total	Forest Land (acres) % total	Urban Land (acres) % total	Ponds & Lakes (acres) % total	Mined Lands (acres) % total	Other Land (acres) % total
010 Tallaseehatchee Creek	128,147	3,305 3%	9,914 8%	87,353 68%	17,626 14%	2,208 2%	4,406 3%	3,335 3%
020 Walthall Branch	8,611	1,050 12%	2,570 30%	4,331 50%	300 3%	360 4%	0 0%	0 3%
030 Yellowleaf Creek	118,484	5,250 4%	19,500 16%	83,550 71%	7,600 6%	950 1%	47 0%	1,587 1%
040 Kahatchee Creek	15,836	633 4%	2,375 15%	8,552 54%	2,375 15%	1,109 7%	317 2%	475 3%
050 Beeswax Creek	36,371	1,000 3%	6,100 17%	25,091 69%	3,055 8%	800 2%	70 0%	255 1%
060 Cedar Creek	41,594	1,664 4%	10,399 25%	24,955 60%	1,248 3%	2,912 7%	0 0%	416 1%
070 Peckerwood Creek	53,130	162 0%	2,450 5%	46,848 88%	73 0%	3,101 6%	108 0%	388 1%
080 Spring Creek	14,511	350 2%	2,800 19%	8,781 61%	2,200 15%	380 3%	0 0%	0 0%
090 Buxahatchee Creek	44,551	1,050 2%	4,200 9%	37,040 83%	890 2%	282 1%	180 0%	909 2%
100 Waxahatchee Creek	87,372	1,000 1%	6,700 8%	74,421 85%	2,310 3%	580 1%	1,080 1%	1,281 1%
110 Upper Hatchet Creek	96,450	75 0%	6,803 7%	88,000 91%	194 0%	265 0%	10 0%	1,103 1%
120 Socapatoy Creek	48,708	0 0%	2,922 6%	44,539 91%	779 2%	127 0%	0 0%	341 1%
130 Middle Hatchet Creek	84,188	0 0%	3,368 4%	77,452 92%	1,684 2%	842 1%	0 0%	842 1%
140 Weogufka Creek	78,757	516 1%	8,821 11%	67,300 85%	129 0%	179 0%	158 0%	1,654 2%
150 Lower Hatchet Creek	38,844	0 0%	0 0%	34,735 89%	97 0%	3,884 10%	0 0%	128 0%
160 Walnut Creek	112,675	7,594 7%	14,338 13%	85,361 76%	3,500 3%	150 0%	0 0%	1,732 2%
170 Chestnut Creek	80,961	6,080 8%	8,670 11%	57,369 71%	4,610 6%	2,437 3%	0 0%	1,795 2%
180 Weoka Creek	121,204	1,519 1%	11,252 9%	101,839 84%	4,205 3%	1,840 2%	2 0%	547 0%
190 Pigeon Roost Creek	11,288	2,370 21%	1,242 11%	3,837 34%	2,934 26%	905 8%	0 0%	0 0%
200 Taylor Creek	28,913	819 3%	5,460 19%	16,611 57%	5,823 20%	200 1%	0 0%	0 0%
Basin	1,250,595	34,437 3%	129,884 10%	977,965 78%	61,632 5%	23,511 2%	6,378 1%	16,788 1%

Source: Alabama Soil and Water Conservation Committee, Basin Assessments, 1998

The type of forest land is another indicator of how the land is used. Those watersheds which have a high percentage of evergreen and mixed forest are more likely to be used for silviculture, or timber production. Of the five watersheds that have the highest percentage of forested land, Upper Hatchet Creek has the highest percentage of deciduous forest, at 52.25 percent reflecting the presence of the Talladega National Forest in the watershed. In the Middle Hatchet Creek and Socapatoy watersheds the percentage of deciduous forest is just over 40 percent in each. In the Lower Hatchet Creek and Peckerwood Creek watersheds, the type of forest is roughly divided in thirds between deciduous, evergreen and mixed forest. Other watersheds with a high percentage of deciduous forest in relation to the total forested land are the Weogufka Creek watershed, at 39.71 percent, and the Weoka Creek watershed, at 86.61 percent.

Figure 79:



Source: Alabama Department of Environmental Management, 2004, USGS Land Satellite Data, 1996.

Basin-wide, the percentage of mixed and evergreen forest combined is 48.42 percent, representing significant potential for silviculture activities throughout the basin. Those watersheds which have the highest potential for silviculture, based on the combined percentage of mixed and evergreen forests, are as follows:

Watershed	% Mixed and Evergreen	Total % Forested
Buxahatchee Creek	63.55%	83%
Waxahatchee Creek	61.10%	85%
Taylor Creek	54.23%	57%
Spring Creek	53.02%	61%
Peckerwood Creek	52.83%	88%
Socapatoy Creek	51.99%	91%
Lower Hatchet Creek	51.79%	89%
Weoka Creek	50.59%	84%
Middle Hatchet Creek	50.32%	92%

Those watersheds with the highest percentage of agricultural land are Walthall Creek at 42 percent, Pigeon Roost Creek at 32 percent, Cedar Creek at 29 percent, Taylor Creek at 22 percent, and Spring Creek at 21 percent. In all of the watersheds except one, the percentage of pasture land is significantly higher than the percentage of crop land. In the five primary agricultural watersheds, pasture land ranges from 11 percent in the Pigeon Roost Creek watershed to 30 percent in the Walthall Creek watershed. The Pigeon Roost Creek watershed is the only watershed out of all 20 watersheds in which there is more land used for crop purposes, at 21 percent, than for pasture land.

Those watersheds with the highest percentage of urban land are Pigeon Roost Creek at 26 percent, Taylor Creek at 20 percent, Kahatchee Creek at 15 percent, Spring Creek at 15 percent, and Tallassehatchee Creek at 14 percent. Although these five watersheds have the highest percentage of urban land uses, the percentage of urban land is still low. Urban land uses, however, have a much greater impact on water quality than other land uses. Thus, by making even a small percentage of change to the land use of an urban area, a potential major contribution to water quality issues can result. The Pigeon Roost Creek watershed encompasses a very small area, only 11,288 acres, and includes the western half of Wetumpka and Interstate 65. The Pigeon Roost Creek watershed also has a high percentage of agricultural land (32 percent) and the lowest percentage of forested land of any of the watersheds, at 34 percent. The Taylor Creek watershed, located adjacent to the Pigeon Roost Creek watershed, includes the eastern half of the City of Wetumpka and high traffic volumes on US Highway 231. In the Wallsboro community, north of Wetumpka, traffic volume increased 17.70 percent between 1992 and 2004. The Alabama Industrial Directory lists 17 industries in the Wetumpka area employing between 876 and 1,110 persons. Together, these two watersheds only occupy 3.21 percent of the entire Lower Coosa River Basin.[5]

The Kahatcee Creek, Spring Creek and Tallassehatchee Creek watersheds are all located in the northern part of the basin. The Kahatchee Creek and Tallassehatchee Creek watersheds are adjacent to one another in Talladega County. Approximately half of the Tallassehatchee Creek watershed is occupied by the Talladega National Forest. The western half, however, includes Sylacauga, the eastern half of Childersburg and the Oak Grove, Sycamore and Winterboro communities and US Highway 280. The Kahatchee Creek watershed, which is only 15,836 acres in size, encompasses the western half of Childersburg. The Alabama Industrial Directory lists seven industries in the Childersburg area, employing between 222 and 341 persons, and 39 industries in the Sylacauga area, employing between 3348 and 4250 persons. The Spring Creek watershed, located between Alabama Highway 145 and the Coosa River in southern Shelby County, is only 14,511 acres in size. Although there are no municipalities within the Spring Creek watershed, the area does include a major portion of Lay Lake and is in a high growth area of Shelby County.[5]

Land use in the remaining eight watersheds is primarily forest land ranging from 69 percent in the Beeswax Creek watershed to 85 percent in the Waxahatchee Creek and Weogufka Creek watersheds, however, they have more of a mix of land uses than the major forested watersheds. Yellowleaf Creek watershed has a significant mix of land uses with forest at 71 percent, agriculture at 20 percent, and urban at 6 percent. The same is true for the Beeswax Creek watershed, with 69 percent forest, 20 percent agriculture and 8 percent urban. The

Buxahatchee Creek, Waxahatchee Creek, Weogufka Creek and Weoka Creek watersheds are more heavily forested than the other four watersheds, at 83 percent, 85 percent, 85 percent and 84 percent forest, respectively. Buxahatchee Creek watershed also has 11 percent agriculture, 2 percent urban and 2 percent other land uses while Waxahatchee Creek watershed has 9 percent agriculture, 3 percent urban and 1 percent mined land uses. Weogufka Creek watershed has 12 percent agriculture and 2 percent other land uses. And, Weoka Creek has 10 percent agriculture and three percent urban land uses. The Walnut Creek and Chestnut Creek watersheds primarily have agriculture and forest land uses with small amounts of other uses mixed in. The Walnut Creek watershed is 20 percent agriculture, 76 percent forest, 3 percent urban and 2 percent other land uses. The Chestnut Creek watershed is 19 percent agriculture, 71 percent forest, 6 percent urban and 2 percent other land uses. Mining land uses are only found in three of the watersheds: Tallaseehatchee Creek watershed, at 3 percent; Kahatchee Creek watershed at 2 percent, and Waxahatchee Creek watershed, at 1 percent. Watersheds with the highest percentage of ponds and lakes are Lower Hatchet Creek at 10 percent, Cedar Creek at 7 percent and Peckerwood Creek at 6 percent.

Source Documents:

1. Alabama Department of Transportation. Historic Road and Trails Map. April 1975.

2. Alabama Water Improvement Commission, *Water Quality Management Plan: Coosa River Basin*. July 1976.

3. Alabama Department of Environmental Management. *Surface Water Quality Screening Assessment of the Coosa River Basin – 2000*. Prepared by the Aquatic Assessment Unit, Montgomery Branch – Field Operations Division. April 1, 2002.

4. Alabama Agricultural Statistical Service. *2002 Alabama Agricultural Statistics Annual Bulletin.* September 2002.

5. Alabama Development Office. *2003-2004 Alabama Industrial Directory*.

Chapter 6
Water Uses in the Lower Coosa River Basin

Alabama has traditionally been considered to be a water abundant state. During the droughts that occurred in the late 1980s, however, it became apparent that certain water problems were not drought related. That created a renewed awareness among water resource managers that the quality and quantity of this important resource had to be protected.

"Access to water determines the economic prosperity and quality of life in all cultures." Neither Alabama nor the Lower Coosa River Basin are exceptions to this statement made by the Alabama Water Resources Study Commission in 1991. Water is a pervasive resource that impacts all facets of the lives of every resident in the Lower Coosa River Basin.

There exists an infinite variety of users of the surface water found in the Lower Coosa River Basin. Some of the water uses require a permit and some do not. Users of the streams and creeks and of the Coosa River include those who take water from the river system and those who use the river system to discharge water. Water uses often correspond to the land use, and more often than not, the water uses are inherently tied to the local economy. Thus, the protection, sharing and management of water resources is vital to the long-term well-being of the population and their lifestyles. This chapter provides an inventory of the both withdrawal and non-withdrawal water users in the Lower Coosa River Basin and, to the extent possible, their economic impact on the basin area.

Tracking Water Use

In 1991, by Executive Order, the Governor of Alabama directed that the Director of the Alabama Department of Economic and Community Affairs (ADECA) establish an Office of Water Resources in the department. The Office of Water Resources was commissioned to develop comprehensive plans and strategies for the use of the state's water resources. The Office of Water Resources was also requested to assess areas of the state analytically to determine if available water supplies are sufficient to satisfy existing and future demands. The Office of Water Resources was officially created on February 23, 1993, when the legislature passed the Alabama Water Resources Act.[1]

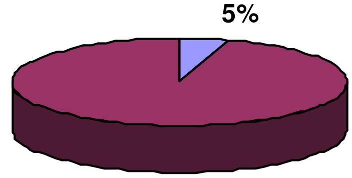
The Alabama Water Resources Act directed the 19-member Alabama Water Resources Commission to adopt rules and regulations for the operation of the commission and for governing declarations of beneficial water use and certificates of water use. The rules and regulations were adopted on December 9, 1993, and became effective on February 22, 1994. The Alabama Water Resources Act requires all public water-supply systems and any person who diverts, withdraws, or consumes more than 100,000 gallons of water each day to submit a Declaration of Beneficial Use to the Office of Water Resources. However, no Declaration of Beneficial Use is required for in-stream uses of water or for impoundments less than 100 acres in size that are confined upon one's property or are solely used for recreational purposes. The Office of Water Resources issues a Certificate of Use to water users after they submit a Declaration of Beneficial Use. Each year, water users who are required to submit a Declaration of Beneficial Use must report the amount of water consumed, diverted, or withdrawn each month as a condition of re-issuance of the Certificate of Use. This certificate is issued for a period ranging from 5 to 10 years, at the discretion of the Division Chief of the Office of Water Resources. Water users required to file a Declaration of Beneficial Use who either fail to file or provide false information are violating the Alabama Water Resources Act. Also, violations of the act after issuance of the Certificate of Use could result in suspension, revocation, termination, or modification of the Certificate of Use. Violations of the Act may result in civil penalties that are assessed by the Office of Water Resources. The penalties will not exceed $1,000 for each violation; however, each day a violation continues constitutes a separate violation. The maximum penalty will not exceed $25,000 in any calendar year.[1]

Withdrawal Uses

Those who take water from the river system are categorized as withdrawal uses and include public water systems, self-supplied industrial and commercial facilities, agricultural, self-supplied domestic, power generation and mining. Based on data available from ADECA, an estimated 6.148 billion gallons per day (bgd) was withdrawn from surface water and groundwater sources for use in Alabama, which equates to approximately 1,474 gallons per day per person in the State. This is a tremendous decrease from water withdrawals in 1980, when approximately 25.6 bgd were withdrawn according to data collected by the U.S. Geological Survey.[1] This trend in the decrease of water usage has also occurred nationwide. Since the decreasing trend in water usage is accompanied by an increase in population, the decrease must result from a combination of

Figure 80:

Water Withdrawals, 2000
Lower Coosa River Basin Counties

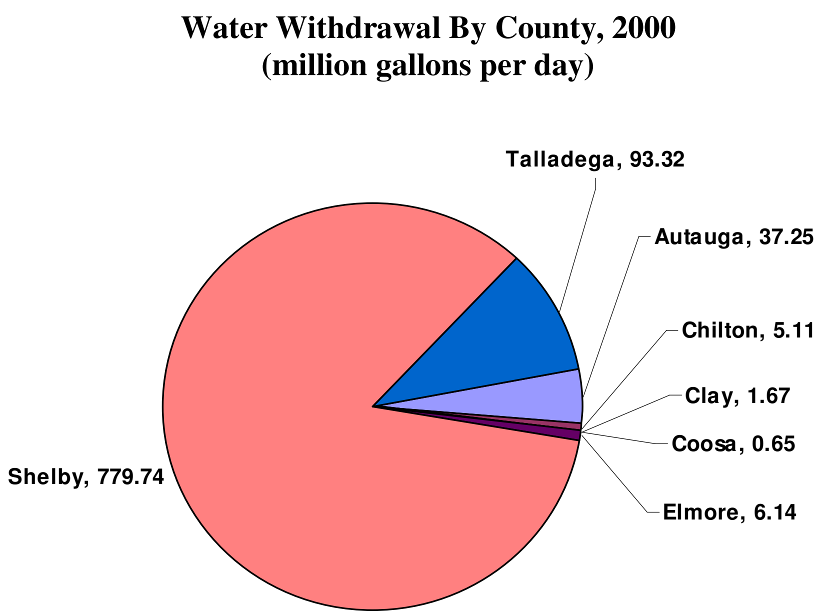


Source: USGS. Estimated Use of Water in the United States, County Level Data, 2000. http://water.usgs.gov/wateruse conservation and reuse. While the use of reclaimed wastewater was 36 percent higher nationwide in 1995 than in 1990, there was no report of wastewater reclamation in Alabama.[1]

In 2000, water use withdrawal of both ground and surface water in the seven counties located in the Lower Coosa River Basin totaled 923.88 million gallons per day. Of this total water withdrawal, 879.71 million gallons per day, or 95 percent, was withdrawn from surface water. Shelby County had the highest water withdrawal rates, by far, with 84.4 percent of the total water withdrawn occurring there. Shelby County was distantly followed by Talladega County with 10 percent of the total water withdrawals. Autauga, Chilton, Clay, Coosa, and Elmore Counties combined only had water withdrawal rates of 5.6 percent of the total. When divided into surface water and ground water, the rate for Shelby County was even higher, with more than 98 percent of the county water withdrawal being from surface water sources. [2]

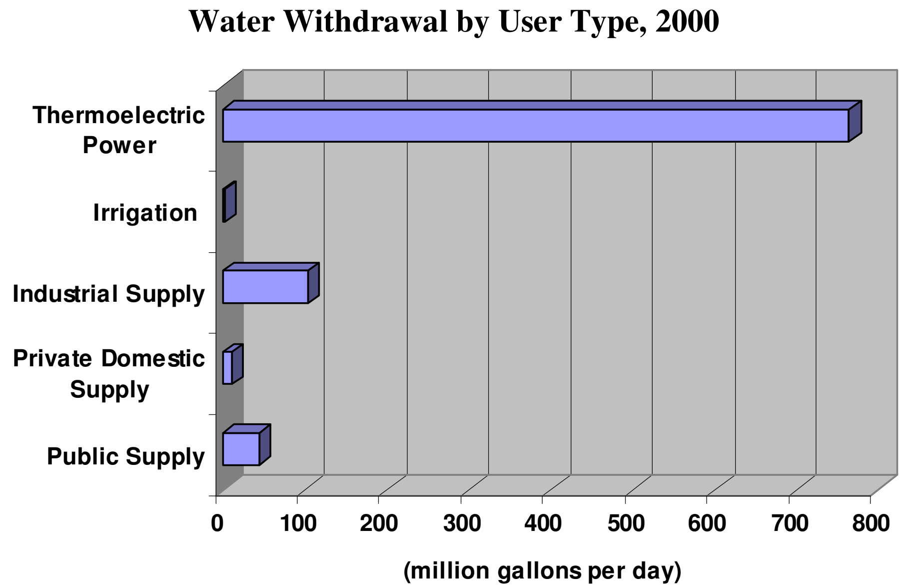
Of the 923.88 million gallons of water withdrawn per day in the seven-county area, the greatest portion, at 82.69 percent, is used for thermoelectric power, followed distantly by industrial uses at 11.25 percent. Public and private water supply systems combined only use 5.91 percent and irrigation purposes use less than 1 percent.[2]

Figure 81:



Source: USGS. Estimated Use of Water in the United States, County Level Data, 2000. http://water.usgs.gov/wateruse

Figure 82:



Source: USGS. Estimated Use of Water in the United States, County Level Data, 2000. http://water.usgs.gov/wateruse

Water Systems. Municipal and private, or self supplied, use of water in the Lower Coosa River Basin provides domestic water for culinary and cleaning purposes, lawn irrigation, and certain recreational activities such as filling and maintaining swimming pools. Municipal water use also includes lost water including water used for fire fighting and system losses occurring in transmission lines. In 1997, public water systems served an estimated 3.97 million people in Alabama, using approximately 787 million gallons per day, which was an increase of about 1.3 percent over the previous year. During that same year, the state's population increased by less than one percent.[1]

In the seven county area of the Lower Coosa River Basin, public water systems served approximately 74.05 percent of the total population, while the remainder of the population was served by private water systems. In the private water systems, 100 percent of the water was withdrawn from groundwater sources. In the public water systems, 66 percent of the water was withdrawn from groundwater sources and 34 percent was withdrawn from surface water.[2]

In 2000, the county with the highest percentage of water usage for public water systems was Talladega County, at 34.91 percent of the total public water system usage, followed by Shelby County at 28.75 percent of the total public water system usage. Public water supply usage in Coosa County is only .35 million gallons per day ranking as the county with the lower public water supply usage. Autauga County has the highest percentage of private water supply usage, at 28.39 percent, but is followed closely by Talladega County, at 24.45 percent, and Shelby County, at 23.00 percent. Again, Coosa County has the lowest percentage of water used for private water systems, at 2.89 percent of the total for the seven-county area.[2]

Figure 83:

Water System Water Usage by County, 2000					
Public Water System			**Private Water System**		
County	**MGD**	**% Total**	**County**	**MGD**	**% Total**
Autauga	5.70	12.87%	Autauga	2.95	28.39%
Chilton	3.51	7.93%	Chilton	1.10	10.59%
Clay	1.10	2.48%	Clay	0.57	5.49%
Coosa	0.35	0.79%	Coosa	0.30	2.89%
Elmore	5.43	12.26%	Elmore	0.54	5.20%
Shelby	12.73	28.75%	Shelby	2.39	23.00%
Talladega	15.46	34.91%	Talladega	2.54	24.45%
7-County Total	44.28	100.00%	7-County Total	10.39	100.00%
Source: USGS. Estimated Use of Water in the United States, County Level Data, 2000. http://water.usgs.gov/wateruse					

As of July 2004, the Office of Water Resources only reports four water use certificate holders for public water systems in the Lower Coosa River Basin. These are the Clanton Waterworks and Sewer Board, Five Star Water Supply, the Goodwater Water Works and Sewer Board and the Sylacauga Utilities Board. Therefore, the great majority of the water users for public and private water systems in the seven-county area must be located outside the Lower Coosa River Basin boundaries.

Self-Supplied Industrial and Commercial Facilities. Industrial water use in the lower Coosa River basin includes water used in industrial processes, cooling water and domestic water used by employees during their respective work shifts. The Office of Water Resources only reported one water use certificate holder for non-public industrial usage in the Lower Coosa River Basin in July 2004, which is Avondale Mills, Sylacauga Facility. Industrial water usage by the seven counties in the Lower Coosa River Basin totals 103.90 million gallons per day. Of the industrial water usage in the seven-county area, just over 92 percent of the water is used by operations in Shelby County. The only other county that reported industrial water usage was Autauga County.[2] The 2003-2004 Alabama Industrial Directory, however, lists 176 industries in the Lower Coosa River Basin, employing between 8,811 and 10,950 persons. The largest industries in the basin, in terms of employment, are ABC Rail Products in Calera (451-550), Madix Inc. in Goodwater (651-700), Avondale Mills in Sylacauga (800- 1,000 in three plants), Imerys in Sylacauga (451-550), and Russell Corporation in Sylacauga (551 – 650).[3]

Figure 84:

Industrial Resources in Lower Coosa River Basin		
County	**Number of Industries**	**Estimated Number of Employees**
Autauga	1	41-50
Chilton	67	1,200 – 1,500
Clay	0	0
Coosa	9	1,000 – 1,250
Elmore	17	875 – 1,110
Shelby	35	1,920 – 2,440
Talladega	47	3,775 – 4,600
Basin	176	8,811 – 10,950
Source: Alabama Development Office. Alabama Industrial Directory, 2003-2004.		

Agricultural Uses. For purposes of water usage, agriculture includes crops, livestock and silviculture. Agricultural uses of water include in the Lower Coosa River Basin include irrigation of crops, orchards and sod farms, water for livestock, and catfish farming. For the State of Alabama, agricultural water use for 1997 was estimated at 306 million gallons per day, a 32 percent increase from 1996. On a national level, however, irrigation water use has been decreasing since 1980.[1]

There are 2,394 farms in the Chilton, Coosa, Elmore, Shelby and Talladega Counties, encompassing approximately 442,703 acres. Autuaga and Clay were not included in the inventory of agricultural statistics since the entire area of each county that is within the basin boundaries is so small that inclusion of the two counties has the potential to skew the information to an extreme that would not be representative of the Lower Coosa River Basin. Just over one-fourth (28.06 percent) of the total agricultural land in the five counties is located in Elmore County, which is followed closely by Talladega County, at 24.74 percent. Shelby County has the least number of farms, but Coosa County has the least amount of acreage in farm use. These farms provide a significant economic base for the area as shown in Figure 85.

Figure 85:

Farm Land and Agricultural Cash Receipts

County	Farm Data			Cash Receipts, 2001 (in $1,000s)			
	Number of Farms	Acres in Farms	Avg. Farm Size (acres)	Crops	Livestock and Poultry	Forest Products	Total Farm and Forestry
Chilton	663	98,746	149	9,925	5,053	9,466	27,476
Coosa	213	41,716	196	245	1,683	12,441	14,701
Elmore	560	124,260	222	8,515	6,165	3,573	23,856
Shelby	435	68,421	157	7,363	3,728	6,000	18,546
Talladega	523	109,560	209	5,088	18,717	5,490	34,366
Total	2,394	442,703	933	$31,136	$35,346	$36,970	$118,945

Source: Census of Agriculture, 1997 and the United States Department of Agriculture, National Agricultural Statistics Service, Alabama Agricultural Statistics, 2002 - Bulletin 44

According to the *Alabama Agricultural Statistics*, 2002 - Bulletin 44, produced by the United States Department of Agriculture, National Agricultural Statistics Service, farm products produced in the five-county area include corn, cotton, hay, soybeans, wheat, peaches, pecans, cattle, hogs and pigs, sod and nursery plants, and timber. The primary agricultural counties in the basin area are Elmore and Talladega in terms of the variety of agricultural production. Chilton County is also a major producer of peaches. A comparison of agricultural production in 1991 with

Figure 86:

Corn Production in the Tallassehatchee Creek Watershed

agricultural production in 2001 shows a decline in half of the product areas: corn, soybeans, pecans, beef cattle, poultry, and sod and nursery plants. See Figure 88. Product areas showing the most significant decline are pecans, corn and beef cattle. Product areas showing the most significant increase in production in descending order are hogs and pigs, cotton, timber and peaches. Production increases range from a 7.75 percent increase in hay to a 67.83 percent increase in hogs and pigs. Production decreases range from a 5.02 percent decrease in sod and nursery plants to a 68. 42 percent decrease in pecans.

Figure 87:

Sod Farming in the Tallassehatchee Creek Watershed

Figure 88:

Agricultural Production Comparison, 1991 to 2001

Crop	1991 Production	2001 Production	% Change	2001 Production Counties (1991)
Corn	366,000 bushels	214,000 bushels	-41.5%	Elmore, Shelby
Cotton	32,230 bales	58,000 bales	+44.43%	Coosa, Elmore, Talladega (Coosa)
Hay	131,000 bales	142,000 bales	+7.75%	All
Soybeans	239,000 bushels	216,000 bushels	-10.65%	Talladega (Elmore)
Wheat	149,000 bushels	184,000 bushels	+19.02%	Elmore, Talladega (Chilton)
Peaches	10,650,000 pounds	16,000,000 pounds	+33.44%	Chilton (Coosa, Shelby, Talladega)
Pecans	95,000 pounds	30,000 pounds	-68.42%	Elmore (Chilton, Coosa, Talladega)
Beef Cattle	55,600 cows	35,500 cows	-36.15%	All
Hogs & Pigs	19,300 hogs/pigs	60,000 hogs/pigs	+67.83%	Elmore (All)
Catfish	Data suppressed	---	---	Elmore
Poultry	8,709 broilers	6,681 broilers	-23.29%	Talladega (Coosa, Elmore)
Sod & Nursery	$7,972	$7,572	-5.02%	All but Chilton (All)
Timber	$17,961	$29,842	+39.81%	All

Source: United States Department of Agriculture, National Agricultural Statistics Service. Alabama Agricultural Statistics, 2002 - Bulletin 44.

Power Generation. Water use by nuclear and fossil fuel power generation plants in Alabama accounted for 4,094 million gallons per day in 1997, or about 67 percent of the water withdrawal in that year.[1] Of the seven counties in the Lower Coosa River Basin, water withdrawal for thermoelectric power facilities is found only in Shelby County. In 2000, this withdrawal was 763.94 million gallons per day, which equated to 82.69 percent of the total water withdrawal.[2] Although the withdrawal rate for the power generation process appears very high, the actual consumptive rate is much lower. Of the water withdrawn, approximately 94 percent is returned to the river almost immediately.

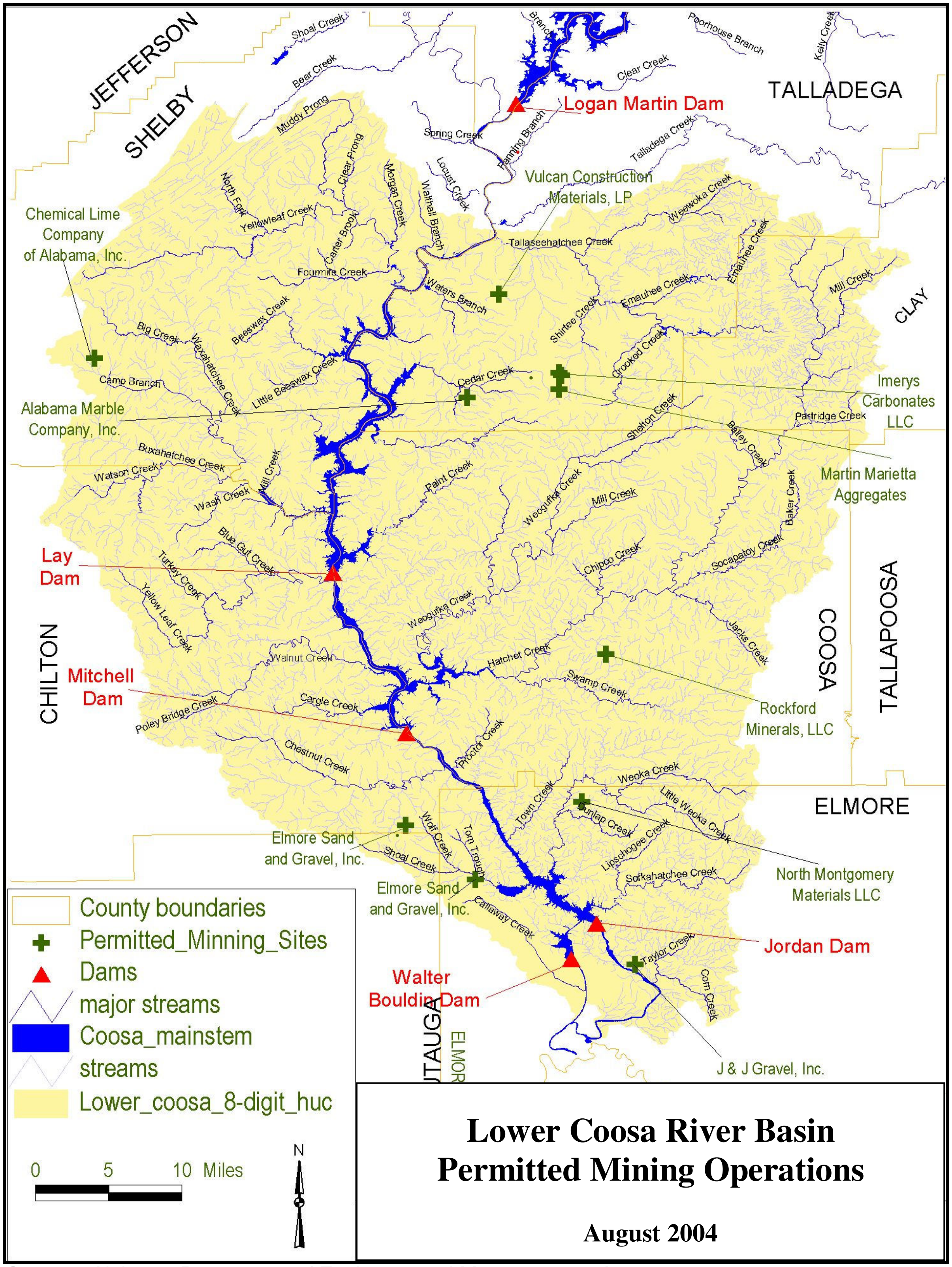
Mining. Statewide, the amount of water withdrawn for mining was insufficient to constitute a major water use. About 20 million gallons per day was withdrawn in 1997 for washing coal, sand and gravel, and for enhanced recovery of hydrocarbons. Much of this water was recycled. Also, water produced by coalbed methane production wells has increased the mining water use value in recent years.[1] There is no data available for water withdrawal for the seven counties in the Lower Coosa River Basin.[2] The map in Figure 89, however, shows the location of thirteen permitted mining operations within the basin boundaries. The highest concentration is found in Talladega County with six operations: two Imerys Carbonates, LLC facilities, Martin Marietta Aggregates, Vulcan Construction Materials, Alabama Marble Company and Alabama Carbonates. There are three operations in Elmore County: Elmore Sand and Gravel, Inc., North Montgomery Materials, LLC, and J&J Gravel, Inc.; two operations in Chilton County, both of which belong to Elmore Sand and Gravel, Inc.; and one operation each in Coosa and Shelby Counties. Rockford Minerals, LLC is located in Coosa County and Chemical Lime Company of Alabama, Inc. is located in Shelby County.

Non-Withdrawal Uses

Those uses that discharge water back into the river system or utilize the water in-stream are categorized as non-withdrawal uses, which include hydroelectric power generation, water treatment, sewage treatment, navigation and recreation/preservation uses. There were 337 permitted discharges into the Lower Coosa River Basin as of September 2003 according to the databases available through the Environmental Protection Agency. Of these, eight are municipal water treatment systems, 22 are municipal wastewater treatment plants, 147 are industrial permits, 13 are mining operations and 102 are stormwater runoff permits.

Hydroelectric Power Generation. At a hydroelectric facility, the force of falling water makes electricity – the greater the fall, the more energy can be produced. A dam stores large amounts of water in a reservoir or lake. The stored water is released to produce electricity, either to meet the electricity demand or to maintain a constant lake level and/or to provide flood control. Water is carried through a penstock, which is basically a big pipe. The penstock distributes water to the wicket gates. The wicket gates control water flow to a turbine. The rushing water forces the turbine to spin. The spinning turbine rotates the generator, which produces electricity. The water exits the power plant through a draft tube into the plant's tailrace, which is immediately downstream of the dam. Power lines carry the produced electricity to residential, commercial and industrial customers.[5]

Figure 89:



Source: Alabama Department of Environmental Management. August 2004.

Power generation use of water in the Lower Coosa River Basin is primarily in-stream use to produce hydropower at Jordan, Mitchell and Lay dams. The construction, operation and capacities of these dams are described in Chapter 1 of this plan. A summary chart, Figure 90, is provided here, however, for ease of reference. All of these facilities are operated by the Alabama Power Company. All of the dams in the Lower Coosa River Basin are run-of-river facilities, utilized to generate power for peak demands, such as air conditioning on hot days.

Figure 90:

Alabama Hydroelectric Dams Capacity			
Dam	**Reservoir Size**	**# Generators**	**Total Capacity**
Lay Dam	12,000 acres	6	177,000 kw
Mitchell Dam	5,850 acres	4	170,000 kw
Jordan Dam	6,800	4	100,000 kw
Bouldin Dam		3	225,000 kw
Source: Alabama Power Company			

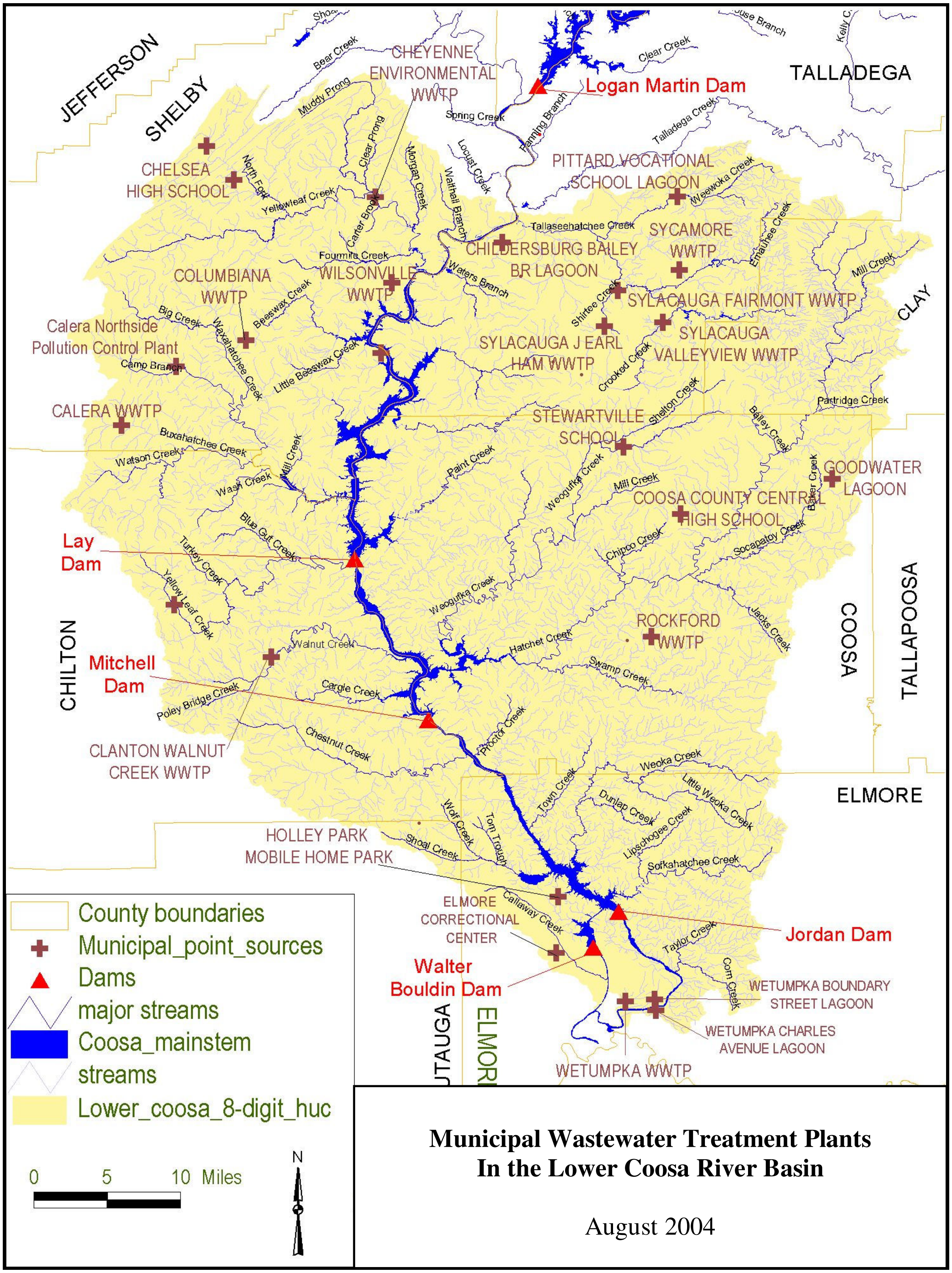
Waste Assimilation. As of September 2003, there were a total of 177 permitted discharges in the Lower Coosa River Basin for waste assimilation. Of the 30 municipalities holding permits, 22 are permitted for discharge of treated sanitary sewer effluent into the Coosa River, or as is the case more often, a tributary to the Coosa River; and eight are permitted for discharge of treated drinking water back into the river system. The remaining permitted discharges are industrial wastewater treatment plants. Each of these permitted uses is shown on the maps in Figure 91 and Figure 92.

The water in the streams or river must be substantial enough to assimilate the treated waste into the receiving water body, using the old adage that the solution to pollution is dilution. Waste water is treated to specifications as required by the National Pollutant Discharge Elimination System permit. The waste is then discharged back into a receiving body of water to mix with non-waste water to further decrease pollution levels.

The majority of the permitted water treatment plants (19 out of 30) are located in the northern part of the basin in Shelby and Talladega Counties. The municipal permitted dischargers serve municipalities, school systems, and prison facilities. They are a combination of wastewater treatment package facilities and lagoon facilities.

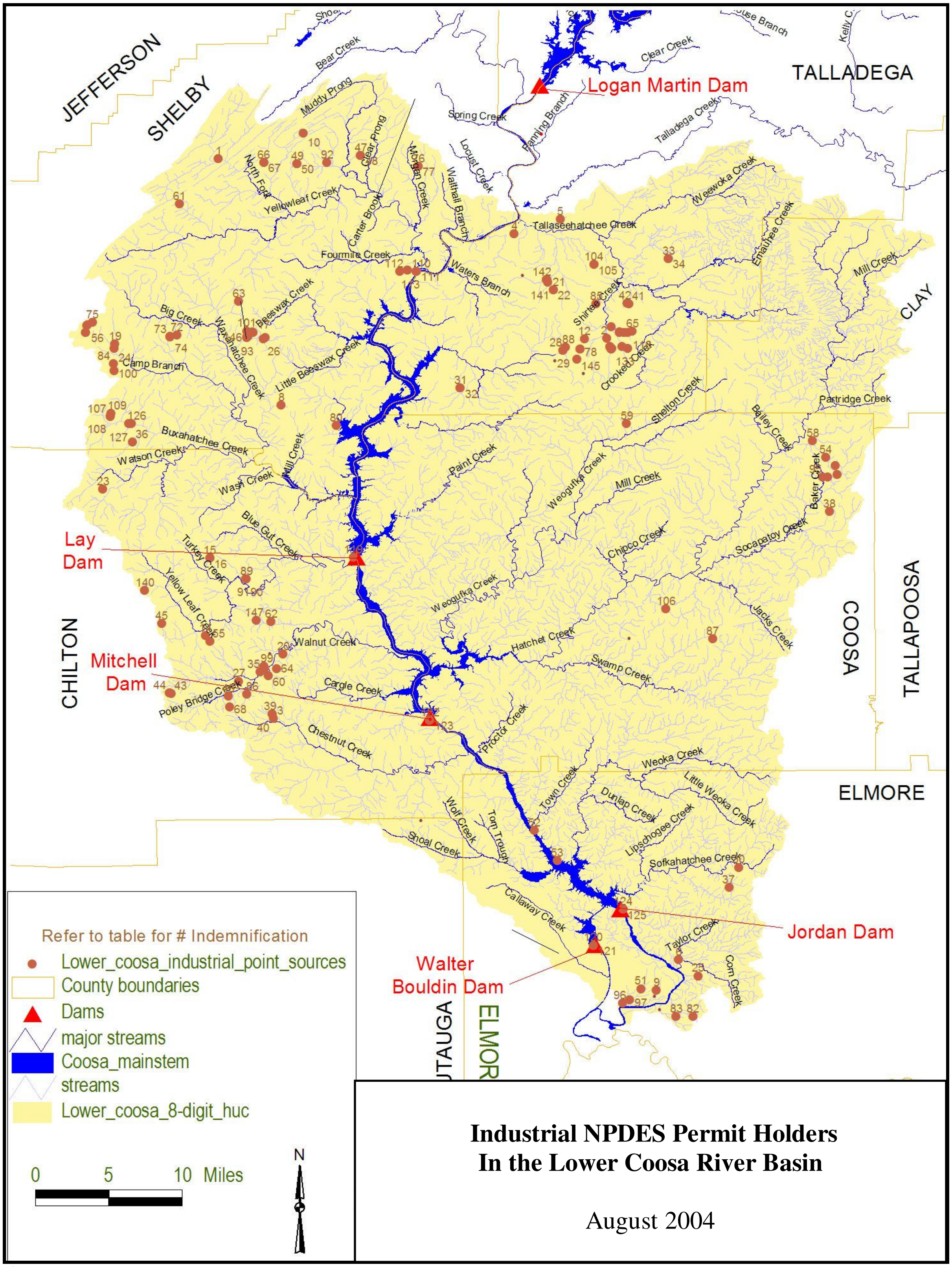
The development patterns of the basin are clearly evident when looking at Figure 92 which shows the location of permitted industrial discharges. Only 10 of the total 147 industrial permits are located in Coosa County, 12 are in Elmore County and none are in Autauga and Clay Counties. The remaining 125 permitted industrial discharges are located in Chilton, Shelby and Talladega Counties. All of these industrial users are located within close proximity to Interstate 65 and US Highway 280, following the land use patterns that were discussed in Chapter 5.

Figure 91:



Source: Alabama Department of Environmental Management. August 2004.

Figure 92:



Source: Alabama Department of Environmental Management. August 2004.

Navigation. At the present time the Coosa River, above Montgomery, is still authorized for the development of a navigable waterway from Montgomery, Alabama to Rome, Georgia. Down stream in the Alabama River, water is used for the movement of goods and eventually affects the production of seafood in the Mobile Bay area. Commercial navigation in the Lower Coosa River Basin is limited by the hydroelectric power dams. Commercial use of the existing river can be made in pool (between dams) for either the movement of goods or commercial passenger services such as sight seeing and river boat rides.

Recreation / Preservation. There are no state parks adjacent to or within the Lower Coosa River Basin area. Recreational use of water in the Lower Coosa River Basin is dominated by the activities related to Jordan, Mitchell and Lay Lakes. These uses include a variety of recreational boating, fishing including major tournaments, and water contact sports such as skiing and swimming. It is conservatively estimated that there are registered boats located within the Lower Coosa River Basin. Boat registration data by county is available through the Alabama Department of Conservation and Natural Resources, Marine Police Division. As of September 2003, there were 28,341 boats registered in the seven counties of the Lower Coosa River Basin. Estimates on the number of boats actually within the basin boundaries was done by applying the same proportion as the proportion of the county population that resides within the basin boundaries to the total number of registered boats in each county.

Figure 93:

Estimated Registered Boats in the Lower Coosa River Basin

County	Total Boat Registrations	Percentage of County Population Within Basin	Estimated # of Boats in Basin
Autauga	2,509	8.46%	212
Chilton	3,501	48.67%	1,704
Clay	754	11.38%	86
Coosa	980	83.49%	818
Elmore	6,173	28.41%	1,754
Shelby	9,390	20.43%	1,918
Talladega	5,034	44.22%	2,226
Total	28,341	30.76%	8,718

Source: Alabama Department of Conservation and Natural Resources, Marine Police Division. As of September2003.

Clearly, water is omni-present in everyone’s life. It is the lifeblood of the Lower Coosa River Basin and Alabama. It enables human existence, provides a fundamental utility service for social institutions in all communities, provides present and future economic opportunities, and sustains the environment around individuals and communities that create the quality of life that the residents of the lower Coosa River basin live in on a daily basis.

Source Documents:

1. Geologic Survey of Alabama. *Water in Alabama (including basic water data).* Circular 1220. David C. Kopaska-Merkel and James D. Moore. Tuscaloosa, Alabama, 2002.

2. USGS. *Estimated Use of Water in the United States, County Level Data, 2000*. http://water.usgs.gov/wateruse

3. Alabama Development Office, *Alabama Industrial Directory, 2003-2004*.

4. United States Department of Agriculture, National Agricultural Statistics Service, *Alabama Agricultural Statistics*, 2002 - Bulletin 44

5. Alabama Power Company. Coosa / Warrior Relicensing Project. Initial Information Package for the Mitchell Development FERC No. 82.

Part II
Water Quality

Chapter 7
Water Use Classification

Each of the surface water bodies in Alabama's bountiful hydrologic system has been assigned a use classification, such as public water supply or fish and wildlife. Based upon the use classification, the body of water must maintain certain standards to remain in that use classification. If the water quality falls below the specified standards, measures are taken to bring the water quality back up to standards. These measures may mean additional restrictions and limitations on water usage and treatment. The results have the potential to impact everyone by limiting food resources and recreational activities to increases in utility bills due to the additional water usage and treatment requirements. It is important to understand how the water in the Lower Coosa River Basin is used and what standards must be met to continue that usage. This chapter provides an overview of the water use classification system implemented by the State of Alabama and outlines how the streams in the Lower Coosa River Basin are classified.

Section 22-22-1 of the *Code of Alabama, 1975*, (*Code*)as amended, includes as its purpose *"... to conserve the waters of the State and to protect, maintain and improve the quality thereof for public water supplies, for the propagation of wildlife, fish and aquatic life and for domestic, agricultural, industrial, recreational and other legitimate beneficial uses; to provide for the prevention, abatement and control of new or existing water pollution; and to cooperate with other agencies of the State, agencies of other states and the federal government in carrying out these objectives."*[1]

The Alabama Department of Environmental Regulations Administrative Code, Division 335-6-10-.01, states, "Water quality criteria covering all legitimate water uses, provide the tools and means for determining the manner in which waters of the State may be best utilized, provide a guide for determining waste treatment requirements, and provide the basis for standards of quality for State waters and portions thereof. Water quality criteria are not intended to freeze present uses of water, nor to exclude other uses that have yet to be determined. They are not a device to insure the lowest common denominator of water quality, but to encourage prudent use of the State's water resources and to enhance their quality and productivity commensurate with the stated purpose of Section 22-22-1 of the *Code of Alabama*."[1]

Water Use Classification System

As required by the Environmental Protection Agency, each state establishes its own water use classification system. In Alabama, there are seven classifications: Outstanding Alabama Water; Public Water Supply; Swimming and Other Whole Body Water-Contact Sports; Shellfish Harvesting; Fish and Wildlife; Limited Warmwater Fishery; and Agricultural and Industrial Water Supply. In addition to the seven state classifications, there is another federal classification which is "Outstanding Natural Resource Water." Water quality criteria are most stringent for the Outstanding Natural Resource Water and Outstanding Alabama Water classifications and least stringent for the Agricultural and Industrial Water Supply classification.

Figure 94:

Water Use Classifications

Classification	Best Usage	Conditions Related to Best Usage
Outstanding Natural Resource Water	This is a special designation. High quality waters that constitute an outstanding National resource, such as waters of national and state parks and wildlife refuges and waters of exceptional recreational or ecological significance, may be considered for designation as an ONRW. For those designated, existing water quality shall be maintained and protected.	
Outstanding Alabama Water	Activities consistent with the natural characteristics of the water	High quality waters that constitute an outstanding Alabama resource, such as waters of state parks and wildlife refuges and waters of exceptional recreational or ecological significance, may be considered for classification as an Outstanding Alabama Water.
Public Water Supply	Source of water supply for drinking or food-processing purposes	If subjected to approved primary treatment and secondary treatment, as necessary, these waters will be considered safe for drinking or food-processing purposes. *Other Uses*: incidental water contact and recreation from June through September. Water contact in the vicinity of discharges is strongly discouraged.
Swimming and Other Whole Body Water-Contact Sports	Swimming and other whole body water-contact sports	Under proper sanitary supervision, these waters will meet standards for outdoor swimming places. Also be suitable for propagation of fish, wildlife and aquatic life. In salt waters, suitable for propagation and harvesting of shrimp and crabs.
Shellfish Harvesting	Propagation and harvesting of shellfish for sale or use as a food product	Meet the sanitary and bacteriological standards in the National Shellfish Sanitation Program Model Ordinance, 1999. Also suitable for propagation of fish and other aquatic life, including shrimp and crab.
Fish and Wildlife	Fishing, propagation of fish, aquatic life and wildlife	Suitable for fish, aquatic life and wildlife propagation. Salt and estuarine waters will also by suitable for the propagation of shrimp and crabs.
Limited Warm Water Fishery	(May–Nov) Agricultural irrigation, livestock watering, industrial cooling and process water supplies	(May-Nov) Suitable for agricultural irrigation, livestock watering, and industrial cooling waters. Usable after treatment for industrial process water supplies. Also suitable for uses for which waters of lower quality will be satisfactory.
Agricultural and Industrial Water Supply	Agricultural irrigation, livestock watering, industrial cooling and process water supplies	Except for natural impurities, these waters will be suitable for agricultural irrigation, livestock watering, industrial cools waters and fish survival. Usable after treatment for industrial process water supplies. Also suitable for uses for which waters of lower quality will be satisfactory.

Source: Alabama Department of Environmental Management, ADEM Regulations 335-6-10.09 through 335-6-10.10. www.adem.state.al.us

As stated in Chapter 2 of this plan, 23 of the surface water bodies in the Lower Coosa River Basin have been assigned a use classification. Each of the classified water bodies of the Lower Coosa River Basin and their use classification is listed in Figure 95 and shown on the map in Figure 96. Of those classified, one is classified for agricultural and industrial water supply; nine are classified for fish and wildlife; three are classified for swimming and other whole body water-contact sports and fish and wildlife; and, five are classified for public water supply, swimming and other whole body water-contact sports, and fish and wildlife. The remaining four streams are classified as Outstanding Alabama Waterways. Two of these are classified for use as fish and wildlife, one is for swimming and fish and wildlife, and one is for public water supply and fish and wildlife. Two stream segments have also been listed as a National Outstanding Water Resource by the National Park Service.

Figure 95:

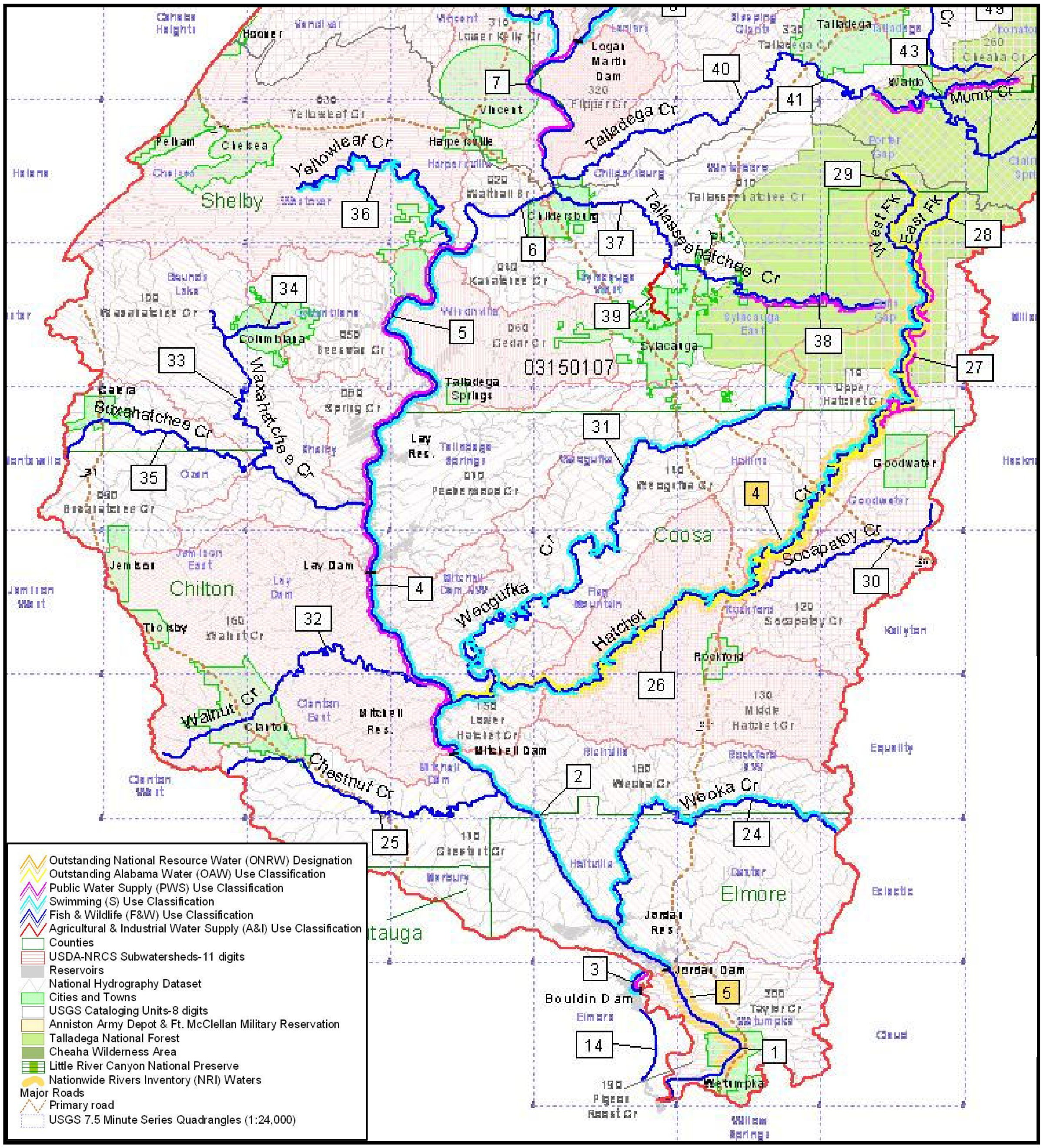
Lower Coosa River Basin Classified Waters

#	Stream	From	To	Classification
1	Coosa River	Tallapoosa River	Jordan Dam	F&W
2	Coosa River (Lake Jordan)	Jordan Dam	Mitchell Dam	S/F&W
3	Coosa River (Lake Jordan)	Bouldin Dam	Alabama Highway 111	PWS/S/F&W
4	Coosa River (Lake Mitchell)	Mitchell Dam	Lay Dam	PWS/S/F&W
5	Coosa River (Lake Mitchell)	Lay Dam	Southern RR Bridge (1.33 miles above Yellowleaf Creek)	PWS/S/F&W
6	Coosa River (Lay Lake)	Southern RR Bridge (1.33 miles above Yellowleaf Creek)	River Mile 89 (1.5 miles above Talladega Creek)	F&W**
7	Coosa River (Lay Lake)	River Mile 89 (1.5 miles above Talladega Creek)	Logan Martin Dam	PWS/S/F&W
24	Weoka Creek	Coosa River (L. Jordan)	Its source	S/F&W
25	Chestnut Creek	Coosa River (L. Jordan)	Its source	F&W
26	Hatchet Creek	Coosa River (L. Mitchell)	Norfolk Southern RR	OAW/S/F&W
27	Hatchet Creek	Norfolk Southern RR	Junction of E. Fork Hatchet Creek and W. Fork Hatchet Creek	OAW/PWS/ F&W
28	East Fork Hatchet Creek	Hatchet Creek	Its source	OAW/F&W
29	West Fork Hatchet Creek	Hatchet Creek	Its source	OAW/F&W
30	Socapatoy Creek	Hatchet Creek	Its source	F&W
31	Weogufka Creek	Hatchet Cr. (L. Mitchell)	Its source	S/F&W
32	Walnut Creek	Coosa River (L. Mitchell)	Its source	F&W
33	Waxahatchee Creek	Coosa River (Lay Lake)	Its source	F&W
34	Tributary of Waxahatchee Creek	Waxahatchee Creek	Its source	F&W
35	Buxahatchee Creek	Waxahatchee Creek (Lay Lake)	Its source	F&W
36	Yellowleaf Creek	Coosa River (Lay Lake)	Its source	S/F&W
37	Tallassehatchee Creek	Coosa River (Lay Lake)	Sylacauga's water supply reservoir dam	F&W
38	Tallassehatchee Creek	Sylacauga's water supply reservoir dam	Its source	PWS/F&W
39	Shirtee Creek	Tallassehatchee Creek	Its source	A&I

***Applicable dissolved oxygen level below existing impoundment is 4.0 mg/l*
Source: Alabama Department of Environmental Management, Alabama Water Use Classification Maps. Coosa River Basin Classified Waters, Effective January 12, 2001. www.adem.state.al.us

Figure 96:

**Lower Coosa River Basin Portion of
Coosa River Basin Classified Waters Map**



Source: Alabama Department of Environmental Management, Alabama Water Use Classification Maps. Coosa River Basin Classified Waters, Effective January 12, 2001. www.adem.state.al.us

The National Outstanding Water Resources is a designation of the Nationwide Rivers Inventory (NRI) program of the National Park Service. In order to be listed on the NRI, a river must be free-flowing and possess one or more outstandingly remarkable values which are generally categorized by scenery, recreation, geology, fish, wildlife, prehistory, history, cultural, and other values. The two stream segments in the Lower Coosa River Basin that are designated as National Outstanding Water Resources are the main stem of the Coosa River between Wetumpka and Jordan Dam, and Hatchet Creek, from the Coosa County Road 29 bridge to River Mile 47 northeast of Goodwater.[2]

Designated in 1982, the Coosa River segment is seven miles in length. The designation includes outstandingly remarkable values in the categories of recreation, geology, fish, wildlife, history and culture. This segment of the river is known as an excellent fishery and has known archaeological sites.[2]

The Hatchet Creek segment, also designated in 1982, is 39 miles in length. The listing includes outstandingly remarkable values in the categories of scenery, recreation, fish and wildlife. This stream segment is known as an exceptionally scenic canoeing stream.[2]

Figure 97:

Hatchet Creek near Rockford

Both the Coosa River segment and the Hatchet Creek segment are also classified as Outstanding Alabama Water. Three additional segments of Hatchet Creek are classified as Outstanding Alabama Waters. One is the portion of the stream from Lake Mitchell to the nationally listed segment and the other two are the East Fork and West Fork of Hatchet Creek, just north of the segment listed on the NRI.[3]

In establishing water quality criteria, ADEM regulations include an anti-degradation policy (Section 335-6-10.04) providing the following three provisions, among others:

1. Where the quality of the waters exceed levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water, that quality shall be maintained and protected, except that a new or increased discharge of pollutants may be allowed, after intergovernmental coordination and public participation pursuant to applicable permitting and management processes, when the person proposing the new or increased discharge of pollutants demonstrates that the proposed discharge is necessary for important economic or social development. In such cases, water quality adequate to protect existing uses fully shall be maintained. All new and existing

point source discharges shall be subject to the highest statutory and regulatory requirements, and nonpoint source discharges shall use best management practices adequate to protect water quality consistent with ADEM's nonpoint source control program.[1]

2. Where high quality waters constitute an Outstanding National Resource, such as waters of national and state parks and wildlife refuges and waters of exceptional recreational or ecological significance, that water quality shall be maintained and protected.[1]

3. Developments constituting a new or increased source of thermal pollution shall assure that such release will not impair the propagation of a balanced indigenous population of fish and aquatic life. [1]

In Section 335-6-10.06, ADEM regulations establish minimum conditions that are applicable to all waters in the state, which include provisions that the State waters will be free from substances attributable to sewage, industrial wastes or other wastes that will settle to form bottom deposits which are unsightly, putrescent or interfere directly or indirectly with any classified water use; that State waters will be free from floating debris, oil, scum, and other floating materials attributable to sewage, industrial wastes or other wastes in amounts sufficient to be unsightly or interfere directly or indirectly with any classified water use; and that State waters shall be free from substances attributable to sewage, industrial wastes or other wastes in concentrations or combinations which are toxic or harmful to human, animal or aquatic life to the extent commensurate with the designated usage of such waters.[1]

In establishing general conditions that are applicable to all water quality criteria, ADEM regulations further state in Section 335-6-10-.05 that the quality of any waters (regardless of use) receiving sewage, industrial wastes or other wastes, must be high enough that the discharge of these wastes will not adversely affect the intended use of the water. ADEM recognizes in this section that sometimes natural events cause water quality to exceed the allowable limits and these natural events are excepted from the regulations. ADEM regulations also state that, where possible, all waters must be suitable for recreation in and on the waters during the months of June through September. And, finally, this section of the ADEM regulations states that when a new water quality standard is implemented to correct a water quality problem, that all existing permits will be modified or reissued to limit the continued discharge of a substance creating the water quality problem. In these cases, the permit holder must come in compliance with the new water quality standard as soon as practical, but in all cases within three years of implementing the new standard.[1]

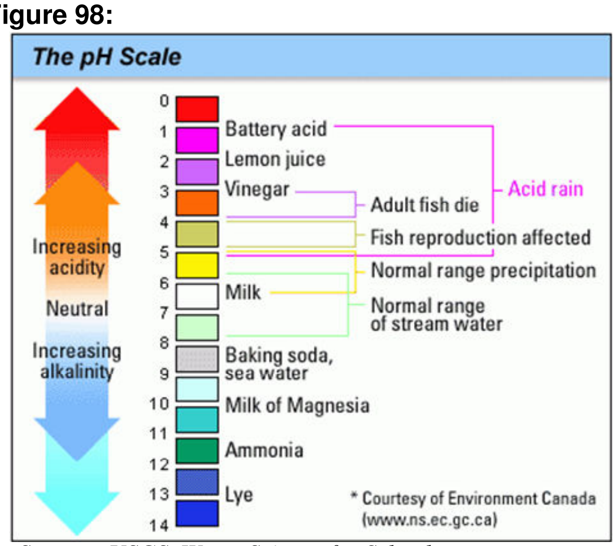
Water Quality Parameters

To insure that streams continue to meet their designated use classifications, water quality criteria were established for each of the use classifications. These criteria provide specific limits for each of the allowed pollutants, allowing for the measurement of water quality on an on-going basis. The water quality criteria are based on existing uses, uses reasonably expected in the future, and those uses not now possible because of correctable pollution but which could be made if the effects of pollution were controlled or eliminated. Of necessity, the assignment of use classifications must take into consideration the physical capability of waters to meet certain uses.[1]

Water quality criteria are based on limits established for pH; temperature; dissolved oxygen; toxic substances; taste, odor and color-producing substances; bacteria; radioactivity; and turbidity. To better understand how water quality is affected by each of these factors, the following is a brief explanation of each factor in relation to water quality and the standards for each water use classification as presented in Section 335-6-10.09 of the Alabama Department of Environmental Management Division 6 Regulations.

pH. The power of the concentration of the hydrogen ion is better known as pH and is a measure of how acidic or basic water is, pH has a scale from 0 - 14, with 7 being neutral. A pH measurement of less than 7 indicates acidity, whereas a pH greater than 7 indicates a base. pH is actually a measure of the relative amount of free hydrogen and hydroxyl ions in the water. Water that has more free hydrogen ions is acidic, whereas water that has more free hydroxyl ions is basic. Since pH can be affected by chemicals in the water, pH is an important indicator of water that is changing chemically. pH is reported in logarithmic units, therefore, each number on the scale represents a 10-fold change in the acidity/basicness of the water. Water with a pH of five is ten times more acidic than water having a pH of six. Pollution can change water's pH, which in turn can harm animals and plants living in the water. For instance, water coming out of an abandoned coal mine can have a pH of 2, which would be 100,000 times more acidic than neutral water.[4] As seen in Figure 98, the normal range of stream water is between 5.75 and 7.75. When water becomes more acidic than the normal range, the pH can affect fish reproduction and around a pH level of 4, fish begin to die.[4]

Figure 98:



Source: USGS, Water Science for Schools. http://ga.water.usgs.gov/edu/characteristics.html

Use Classification	pH Limits
Outstanding Alabama Water	(a) Not more than 1 unit from natural pH (b) Not <6 or >8.5
Public Water Supply	
Swimming and Other Whole Body Water-Contact Sports	
Shellfish Harvesting	(a) Not more than 1 unit from natural pH (b) Not <6.5 or >8.5
Fish and Wildlife	(a) Not more than 1 unit from natural pH (b) Not <6 or >8.5
Limited Warm Water Fishery	
Agricultural and Industrial Water Supply	

Temperature. Water temperature is not only important to swimmers and fisherman and fish, but also to industries. Water is used for cooling purposes in power plants that generate electricity. They need cool water to start with and generally release warmer water back to the environment. The temperature of the released water can affect downstream habitats. Temperature also can affect the ability of water to hold oxygen as well as the ability of organisms to resist certain pollutants.[4]

<table>
<tr><th>Use Classification</th><th>Temperature Limits</th></tr>
<tr><td>Outstanding Alabama Water</td><td rowspan="7">(a) Not > 90° F
(b) Can be less stringent on NPDES permit, if permittee can demonstrate that reduced limitations will not harm indigenous aquatic life
(c) Maximum increase above ambient temperature is 5° F due to artificial heat by a discharger</td></tr>
<tr><td>Public Water Supply</td></tr>
<tr><td>Swimming and Other Whole Body Water-Contact Sports</td></tr>
<tr><td>Shellfish Harvesting</td></tr>
<tr><td>Fish and Wildlife</td></tr>
<tr><td>Limited Warm Water Fishery</td></tr>
<tr><td>Agricultural and Industrial Water Supply</td></tr>
</table>

Dissolved Oxygen. Although water molecules contain an oxygen atom, this oxygen is not what is needed by aquatic organisms living in our natural waters. A small amount of oxygen, up to about ten molecules of oxygen per million of water, is actually dissolved in water. This dissolved oxygen is breathed by fish and zooplankton and is needed by them to survive. Rapidly moving water, such as in a mountain stream or large river, tends to contain a lot of dissolved oxygen, while stagnant water contains little. Bacteria in water can consume oxygen as organic matter decays. Thus, excess organic material in our lakes and rivers can cause an oxygen-deficient situation to occur. Aquatic life can have a hard time in stagnant water that has a lot of rotting, organic material in it, especially in summer, when dissolved-oxygen levels are at a seasonal low.[4]

<table>
<tr><th>Use Classification</th><th>Dissolved Oxygen Limits</th></tr>
<tr><td>Outstanding Alabama Water</td><td>(a) Not <5.5 mg/l
(b) Under extreme natural conditions, may range between 5.5 mg/l and 4 mg/l
(c) Measured at a depth of 5 feet in waters 10 feet or deeper; in shallower waters, measured at mid-depth</td></tr>
<tr><td>Public Water Supply</td><td rowspan="4">(a) Not <5 mg/l
(b) Under extreme natural conditions, may range between 5.5 mg/l and 4 mg/l
(c) Measured at a depth of 5 feet in waters 10 feet or deeper; in shallower waters, measured at mid-depth</td></tr>
<tr><td>Swimming and Other Whole Body Water-Contact Sports</td></tr>
<tr><td>Shellfish Harvesting</td></tr>
<tr><td>Fish and Wildlife</td></tr>
<tr><td>Limited Warm Water Fishery</td><td rowspan="2">(a) Not <3 mg/l
(b) Measured at a depth of 5 feet in waters 10 feet or deeper; in shallower waters, measured at mid-depth</td></tr>
<tr><td>Agricultural and Industrial Water Supply</td></tr>
</table>

Toxic Substances. Toxic substances are chemical elements and compounds, such as lead, radon, benzene, dioxin, and numerous others, that are toxic to the human body, and may enter the body by means of ingestion, inhalation, or absorption. There is considerable variation in the degree of toxicity among the various toxic substances and in the exposure level that induces toxicity.[5] Unless otherwise noted, the limitations address toxic substances that are attributable to sewage, industrial or other wastes that are discharged into receiving streams. Testing to determine whether the toxic substances exhibit acute toxicity or chronic toxicity is conducted by effluent toxicity testing or by application of numeric criteria given in ADEM Rule 335-6-10-.07. For more detailed information, refer to this rule in the ADEM Division 6 Administrative Code. For the limited warm water fishery classification, effluent limitations are established pursuant to Chapter 335-6-6 of the ADEM Administrative Code using the minimum 7-day low flow that occurs once in 2 years ($7Q_2$) as the basis for applying the chronic aquatic life criteria. The use of the $7Q_2$ low flow for application of chronic criteria is appropriate based on the historical uses and/or flow characteristics of streams to be considered for this classification.

Use Classification	Toxic Substance Limits
Outstanding Alabama Water	Only such amounts, whether alone or in combination with other substances, that will not exhibit acute or chronic toxicity to fish and aquatic life, including shrimp and crabs in estuarine or salt waters, or the propagation thereof.
Public Water Supply	Only such amounts of toxic substances, color-producing substances, heated liquids, or other deleterious substances, whether alone or in combination with other substances, and only such temperatures as will not render the waters unsafe or unsuitable as a source of water supply for drinking or food-processing purposes, that will not exhibit acute or chronic toxicity to fish, wildlife and aquatic life, or adversely affect the aesthetic value of waters for any use under this classification.
Swimming and Other Whole Body Water-Contact Sports	Only such amounts of toxic substances, color-producing substances, heated liquids, or other deleterious substances, whether alone or in combination with other substances or wastes, as will not render the water unsafe or unsuitable for swimming and water-contact sports; and that will not exhibit acute or chronic toxicity to fish, wildlife and aquatic life or, where applicable, shrimp and crabs; impair the palatability of fish, or where applicable, shrimp and crabs; impair the waters for any other usage established for this classification or unreasonably affect the aesthetic value of waters for any use under this classification.
Shellfish Harvesting	Only such amounts, whether alone or in combination with other substances, that will not exhibit acute or chronic toxicity to fish and aquatic life, including shrimp and crabs; or affect the marketability of fish and shellfish, including shrimp and crabs.
Fish and Wildlife	Only such amounts, whether alone or in combination with other substances, that will not exhibit acute or chronic toxicity to fish and aquatic life, including shrimp and crabs in estuarine or salt waters or the propagation thereof.
Limited Warm Water Fishery	Only such amounts as will not render the waters unsuitable for agricultural irrigation, livestock watering, industrial cooling, and industrial process water supply purposes; interfere with downstream water uses; or exhibit acute toxicity or chronic toxicity to fish and aquatic life, including shrimp and crabs in estuarine or salt waters or the propagation thereof.
Agricultural and Industrial Water Supply	Covered under Taste, Odor and Color-Producing Substance Limits.

Taste, Odor and Color-Producing Substances. These criteria refer to the minimum concentration of a chemical or biological substance which can just be tasted; the minimum odor of a water sample that can just be detected after successive dilutions with odorless water (also called *threshold odor*); and a shade or tint which is imparted to water by substances which are in true solution and thus cannot be removed by mechanical filtration. Color is most commonly caused by dissolved organic matter, but it may be produced by dissolved mineral matter.[5] Unless otherwise noted, these substances are attributable to sewage, industrial wastes or other wastes. Testing to determine whether the taste, odor and/or color-producing substances exhibit acute toxicity or chronic toxicity is conducted by effluent toxicity testing or by application of numeric criteria given in ADEM Rule 335-6-10-.07. For more detailed information, refer to this rule in the ADEM Division 6 Regulations.

Use Classification	Taste, Odor and Color-Producing Substance Limits
Outstanding Alabama Water	Only such amounts, whether alone or in combination with other substances, as will not exhibit acute toxicity or chronic toxicity to fish and aquatic life, including shrimp and crabs in estuarine and salt waters or adversely affect the propagation thereof; impair the palatability or marketability of fish and wildlife or shrimp and crabs in estuarine and salt waters; or unreasonably affect the aesthetic value of waters for any use under this classification.
Public Water Supply	*Also applies to heated liquids and other deleterious substances.* Only such amounts, whether alone or in combination with other substances or wastes, as will not cause taste and odor difficulties in water supplies which cannot be corrected by treatment, or impair the palatability of fish.
Swimming and Other Whole Body Water-Contact Sports	Covered under Toxic Substances Limits
Shellfish Harvesting	Only such amounts, whether alone or in combination with other substances, as will not exhibit acute toxicity or chronic toxicity to fish and shellfish, including shrimp and crabs; adversely affect marketability or palatability of fish and shellfish, including shrimp and crabs; or unreasonably affect the aesthetic value of waters for any use under this classification.
Fish and Wildlife	Only such amounts, whether alone or in combination with other substances, as will not exhibit acute toxicity or chronic toxicity to fish and aquatic life, including shrimp and crabs in estuarine and salt waters or adversely affect the propagation thereof; impair the palatability or marketability of fish and wildlife or shrimp and crabs in estuarine and salt waters; or unreasonably affect the aesthetic value of waters for any use under this classification.
Limited Warm Water Fishery	Covered under Toxic Substances Limits
Agricultural and Industrial Water Supply	*Also applies to other deleterious substances, including chemical compounds.* Only such amounts as will not render the waters unsuitable for agricultural irrigation, livestock watering, industrial cooling, industrial process water supply purposes, and fish survival, nor interfere with downstream water uses.

Bacteria. Bacteria may be free-living organisms or parasites. Bacteria (along with fungi) are decomposers that break down the wastes and bodies of dead organisms, making their components available for reuse. Bacterial cells range from about 1 to 10 microns in length and from 0.2 to 1 micron in width. They exist almost everywhere on earth. Despite their small size, the total weight of all bacteria in the world likely exceeds that of all other organisms combined.

Some bacteria are helpful to man, others harmful.[5] Water quality parameters are based on testing for fecal coliform, which is bacteria found in the intestinal tracts of mammals and, therefore in, fecal matter. The presence of fecal coliform in water or sludge is an indicator of pollution and possible contamination by pathogens. Bacteria is measured using a geometric mean which is calculated from no less than five samples collected at a given station over a

30-day period at intervals of not less than 24 hours. When the geometric mean of the fecal coliform organism density exceeds the required levels, the bacterial water quality is not considered acceptable until a second detailed sanitary survey and evaluation discloses no significant public health risk in the use of the waters. Waters in the immediate vicinity of discharges of sewage or other wastes likely to contain bacteria harmful to humans, regardless of the degree of treatment afforded these wastes, are not acceptable for swimming or other whole body water-contact sports. In assigning the swimming use classification, the proximity of discharges of wastes is taken into consideration, along with the potential hazards involved in locating swimming areas close to waste discharges. Therefore, the swimming classification is not assigned to waters which are dependent on adequate disinfection of waste and where the interruption of waste treatment would render the water unsafe for bathing.

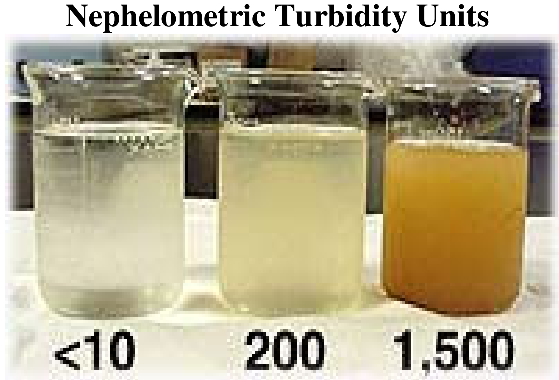
Use Classification	Bacteria Limits
Outstanding Alabama Water	Fecal coliform group: not to exceed a geometric mean of 100/100 ml in coastal waters and 200/100 ml in other waters.
Public Water Supply	(a) Fecal coliform group: not to exceed a geometric mean of 1000/100 ml; nor exceed a maximum of 2000/100 ml in any sample. Enterococci group in coastal waters: not to exceed 275 colonies/100 ml in any sample (b) For incidental water contact and recreation during June through September, the bacterial quality of water is acceptable when a sanitary survey by the controlling health authorities reveals no source of dangerous pollution and when the geometric mean fecal coliform organism density does not exceed 100/100 ml in coastal waters and 200/100 ml in other waters.
Swimming and Other Whole Body Water-Contact Sports	For waters in areas other than the immediate vicinity of discharges of sewage or other wastes, the bacterial quality of water is acceptable when a sanitary survey by the controlling health authorities reveals no source of dangerous pollution and when the geometric mean fecal coliform organism density does not exceed 200 colonies/100 ml in non-coastal waters. In coastal waters, bacteria of the enterococci group shall not exceed a geometric mean of 35 colonies/100 ml nor exceed a maximum of 104 colonies/100 ml in any sample.
Shellfish Harvesting	(a) Not to exceed the limits specified in the latest edition of the National Shellfish Sanitation Program Manual of Operations, Sanitation of Shellfish Growing Areas (1965), published by the Food and Drug Administration, U. S. Department of Health and Human Services. (b) For incidental water contact and recreation during June through September, the bacterial quality of water is acceptable when a sanitary survey by the controlling health authorities reveals no source of dangerous pollution and when the geometric mean fecal coliform organism density does not exceed 100/100 ml in coastal waters and 200/100 ml in other waters.
Fish and Wildlife	(a) Fecal coliform group: not to exceed a geometric mean of 1,000/100 ml ; nor exceed a maximum of 2,000/100 ml in any sample. (b) For incidental water contact and recreation during June through September, the bacterial quality of water is acceptable when a sanitary survey by the controlling health authorities reveals no source of dangerous pollution and when the geometric mean fecal coliform organism density does not exceed 100/100 ml in coastal waters and 200/100 ml in other waters.
Limited Warm Water Fishery	Fecal coliform group: not to exceed a geometric mean of 1000/100 ml; nor exceed a maximum of 2000/100 ml in any sample.
Agricultural and Industrial Water Supply	Fecal coliform group shall not exceed a geometric mean of 2000/100 ml; nor exceed a maximum of 4000/100 ml in any sample.

Radioactivity. Radioactivity is the emissions of radiant atomic energy from some elements, which is caused by the spontaneous disintegration of the nuclei of the atoms of these elements. Radioactive wastes include water or any other materials including spent nuclear reactor fuel, work clothes, or tools that contain radioisotopes. A radionuclide is any man-made or natural element which emits radiation in the form of alpha or beta particles, or as gamma rays.[5] Environmental monitoring for radioactive materials began in the early 1950's with water surveillance for radioactivity resulting from public concern over fallout from nuclear weapons testing. Today, the ADPH operates the Alabama Radiological Environmental Monitoring Program (AREMP) and monitors two operational nuclear power plants (NPPs): TVA's Browns Ferry NPP and Southern Nuclear's Farley NPP. The monitoring programs are localized around the plants and in the Tennessee and Chattahoochee Rivers.[6]

Use Classification	Radioactivity Limits
Outstanding Alabama Water	Concentrations of radioactive materials present shall not exceed the requirements of the Alabama Department of Public Health (ADPH).
Public Water Supply	No radionuclide or mixture of radionuclides shall be present at concentrations greater than those specified by the requirements of the ADPH.
Swimming and Other Whole Body Water-Contact Sports	Concentrations of radioactive materials present shall not exceed the requirement of the ADPH.
Shellfish Harvesting	
Fish and Wildlife	
Limited Warm Water Fishery	
Agricultural and Industrial Water Supply	

Turbidity. Defined as the amount of particulate matter that is suspended in water, turbidity measures the scattering effect that suspended solids have on light – the higher the intensity of scattered light, the higher the turbidity. Materials that cause water to be turbid include clay, silt, finely divided organic and inorganic matter, soluble colored organic compounds, plankton, and microscopic organisms. Turbidity makes the water cloudy or opaque. Turbidity is measured by shining a light through the water and is reported in nephelometric turbidity units (NTU). Turbidity can be measured in the laboratory and also on-site in the river with a handheld turbidity meter. During periods of low flow (base flow), many rivers are a clear green color, and turbidities are low, usually less than 10 NTU. During a rainstorm, particles from the surrounding land are washed into the river making the water a muddy brown color, indicating water that has higher turbidity values. Also, during high flows, water velocities are faster and water volumes are higher, which can more easily stir up and suspend material from the stream bed, causing higher turbidities.

Figure 99:
Turbidity Levels Measured in Nephelometric Turbidity Units



Source: USGS, Water Science for Schools. http://ga.water.usgs.gov/edu/characteristics.html

<table>
<tr><th>Use Classification</th><th>Turbidity Limits</th></tr>
<tr><td>Outstanding Alabama Water</td><td rowspan="7">(a) No turbidity other than natural origin that causes substantial visible contrast with natural appearance and interferes with beneficial uses
(b) Not >50 NTU above background
(c) Background is the natural condition of the receiving waters without influence of man-made or man-induced causes.</td></tr>
<tr><td>Public Water Supply</td></tr>
<tr><td>Swimming and Other Whole Body Water-Contact Sports</td></tr>
<tr><td>Shellfish Harvesting</td></tr>
<tr><td>Fish and Wildlife</td></tr>
<tr><td>Limited Warm Water Fishery</td></tr>
<tr><td>Agricultural and Industrial Water Supply</td></tr>
</table>

Other indicators of water quality that are utilized in the water use classification criteria, but are worthy of explanation, are specific conductance, water hardness and suspended sediment. These are addressed more in the water quality monitoring chapter in Part III of this plan. Specific conductance is a measure of the ability of water to conduct an electrical current. It is highly dependent on the amount of dissolved solids (such as salt) in the water. Pure water, such as distilled water, will have a very low specific conductance, and sea water will have a high specific conductance. Rainwater often dissolves airborne gasses and airborne dust while it is in the air, and thus often has a higher specific conductance than distilled water. Specific conductance is an important water-quality measurement because it gives a good idea of the amount of dissolved material in the water.[4]

The amount of dissolved calcium and magnesium in water determines its "hardness." Water hardness varies throughout the United States. Water hardness is noticeable when it is difficult to produce a good lather when washing hands or clothes. The impact on industries is that they may have extra costs incurred by having to soften their water, as hard water can damage equipment. The water in Alabama is relatively soft, generally between 0 and 60 milligrams of calcium carbonate per liter of water.[4]

Suspended sediment is the amount of soil moving along in a stream. It is highly dependent on the speed of the water flow. Fast-flowing water can pick up and suspend more soil than calm water. During storms, soil is washed from the stream banks into the stream. The amount that washes into a stream depends on the type of land in the river's drainage basin and the vegetation surrounding the river. If land is disturbed along a stream and protection measures are not taken, then excess sediment can harm the water quality of a stream. Sediment coming into a reservoir, or lake, is always a concern because once it enters it cannot get out. Most of it will settle to the bottom and reservoirs can "silt in" if too much sediment enters them. The volume of the reservoir is reduced, resulting in less area for boating, fishing, and recreation, as well as reducing the power-generation capability of hydroelectric facilities. [4]

Source Documents

1. Alabama Department of Environmental Management, ADEM Regulations, Section 335-6-10. www.adem.state.al.us

2. National Park Service. Nationwide Rivers Inventory. http://www.nps.gov/ncrc/programs/rtca/nri

3. Alabama Department of Environmental Management, Alabama Water Use Classification Maps. Coosa River Basin Classified Waters, Effective January 12, 2001. www.adem.state.al.us

4. U.S. Geological Survey. Water Science for Schools, Common Water Measurements derived from *A Primer on Water Quality*, by Swanson, H.A., and Baldwin, H.L., U.S. Geological Survey, 1965. http://ga.water.usgs.gov/edu/characteristics.html

5. Water Quality Association. Glossary, September 1999. http://www.wqa.org/glossary.cfm

6. Alabama Department of Public Health. Office of Radiation Control. www.adph.org/radiation

Chapter 8
Understanding Water Quality

The term water quality can be interpreted in a number of ways. One definition from the U.S. Geological Survey (USGS) is that water quality is a term used to describe the chemical, physical, and biological characteristics of water, usually in respect to its suitability for a particular purpose. When the average person asks about water quality, they probably want to know if the water is good enough to use at home, to play in, to serve in a restaurant, etc., or if the quality of our natural waters is suitable for aquatic plants and animals.

Water quality is also the *study* of the chemical, physical and biological characteristics of surface water and groundwater. As such, it is one of five river basin sciences. The other four river basin sciences are hydrology, fluvial morphology, ecology and hydraulics. Hydrology is the study of precipitation, infiltration, surface runoff, stream flow rates, water storage in wetlands, detention basins, plus water use and diversions. Fluvial morphology is the study of a stream channel's geologic origin, alignment, slope, shape, size, sediments and floodplains. Ecology is the study of plants, animals and their environment, with emphasis on aquatic systems, wetlands and riparian forests. And finally, hydraulics is the study of the stream's water velocity, flow depth, flood elevations, channel erosion, storm drains, culverts, bridges and dams.

To fully understand and implement the actions proposed in the Lower Coosa River Basin Water Quality Improvement Strategy (Part IV), first water quality, as both a descriptive term and a river basin science, must be understood. The two most significant parts of understanding water quality are the balance and interrelationship between the river basin sciences and the balance and interrelationship between a water body (stream or river) and the land surrounding it.

The matrix in Figure 100 demonstrates the interaction of the five river basin sciences by showing how the subject of each of the river basin sciences is also a subject matter of the other river basin sciences. This matrix can be utilized to determine impacts on or from other river basin sciences as issues are identified. The interrelationship between streams and the surrounding land uses is explained in the section on the Watershed Equation and discussed even more in the sections on Beneficial Ecosystem Services. First, however, the stream network is explained as a foundation to understand how and where water quality originates.

Figure 100:

Interrelationship of River Basin Sciences

	Hydrologic	**Hydraulic**	**Ecologic**	**Fluvial Morphology**	**Water Quality**
Hydrologic		Channel encroachments Dams Bridges Culverts Alter peak flows	Vegetation effects Evapotransporation Infiltration Runoff	Floodplains and wetlands Detain water Groundwater discharge Create baseflow	
Hydraulic	Instream flows Flood flows Flood frequency Droughts		Vegetative roughness Friction Woody debris Barriers Beaver dams	Channel size, shape, slope, alignment Bedform roughness Sediment sources	
Ecologic	Flow duration Flow variations Growth Fish	Size and type of aquatic habitats Flow depth, velocity and scour		Substrate type and diversity Pools Riffles Shelters Migratory barriers Spawning sites	Toxics Turbidity Temperature Dissolved Oxygen Levels Salinity pH
Fluvial Morphology	Groundwater recharge Soil moisture Springs and seeps	Velocity Flow Deposition Shear stresses Tractive forges Waves Sediment transport	Aquatic and riparian vegetation traps sediment		Temperature Affects Settling
Water Quality	Base flow Dilution Pollutants	Pollution transport Mixing Aeration Stratification	Respiration Nutrients Solar exposure Oxygen demand Photosynthesis Fine and coarse	Sediment yields Dissolved solids Turbidity Color	

The Stream Network

The stream network is the organizational structure of surface water flowing into a body of water, be it a stream, a lake or a river. In other words, it is the structure of an identified drainage area. In general terms, there are three types of streams based on the level of water flow, i.e., how much running water is contained in the stream bed. *Ephemeral* streams are streams that only flow on the surface periodically, usually during a rainfall event. *Intermittent* streams flow for several periods during the year, such as a season or several months. And, *perennial* streams are streams that flow year-round.

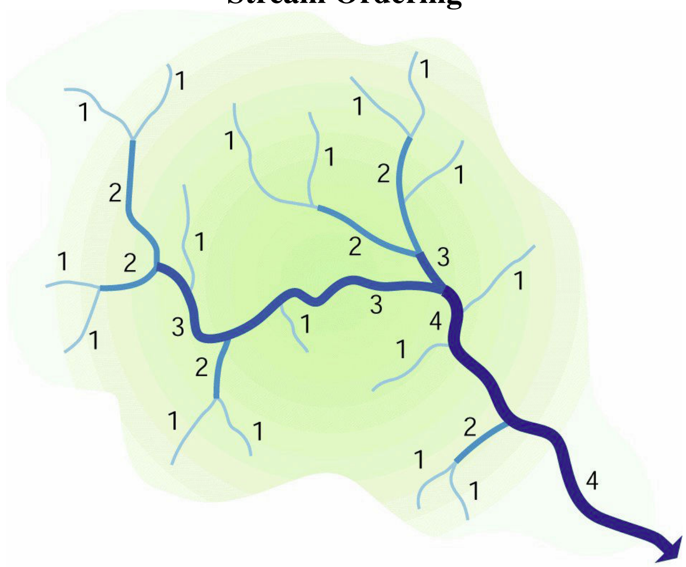
Each stream network begins with a headwater, which is the point at which water begins to flow in a certain direction, or drain into a basin. It is often perceived that "headwater" refers to a small, clear and often cool stream in a shaded area from which the water flows downstream. Instead, the term headwater actually encompasses many other types of small streams, including intermittent streams that flow briefly during precipitation events and that during dry periods may sink into disconnected pools of water or disappear below a "dry stream bed". Typically, spring fed headwaters, or ground seeps, have clear water with a relatively steady temperature and flow. In contrast, headwaters originating in marshy meadows may have tea colored water and experience less stability in temperature and flow.

For more scientific research and studies, the U.S. Geological Stream Order Numbering System is used, which was developed by the U.S. Geological Survey. This system designates a stream by a number, or order, based on how many times it has converged with another stream. The following are the definitions for the USGS stream order numbering system:

Zero-Order Streams: swales, hollows and other formations that lack defined stream banks, but serve as important conduits of water, sediment, nutrients, and other materials during precipitation events
First-Order Streams: streams having the smallest distinct channel such as rivulets of water that flow from hillside springs and form a channel
Second-Order Streams: streams formed when two first-order channels combine
Third-Order Streams: streams formed by the combination of two second-order streams.

Figure 101:

Stream Ordering



Source: Environmental Protection Agency, Nonpoint Source Pollution Education Resources. Whatzzzzup-Stream? http://www.epa.gov/owow/nps/nps_edu

The system then continues based on the intersection of similar order streams to form higher order streams. Nationwide, it is estimated that only about half of the first-order streams intersect other first-order streams and flow into second-order streams. The other half of first-order streams drain directly into larger order streams, rivers, estuaries and oceans. The term "headwater" is often used in the stream order system to refer to the smallest streams in a stream network including zero, first and second-order streams. It is estimated that half of the total length of channels in a stream network can be first-order streams.[1] Stream networks are often mapped showing creeks or, at most, east and west branches or unnamed tributaries flowing into a creek. The low order streams (the ephemeral and intermittent streams), however, are largely unmapped. Since the mapped stream, or creek, is actually formed by the upstream perennial streams, groundwater seeps, intermittent and ephemeral streams, and sheet flow, the concept of the headwaters of a watershed is frequently misunderstood and improperly defined.

Based on available topographic maps from the USGS, it has been estimated that three-fourths, or more, of the total length of streams and channels in the United States are first and second-order streams. For example, field surveys of streams in the Chattooga River watershed in Georgia found thousands of streams, representing over 80 percent of the stream length in the watershed system, were not shown on the USGS topographic maps. In addition, some small streams that were mapped as intermittent were actually perennial. In Georgia's Etowah River Basin, the National Elevation Data detailed about 40 percent of the headwater streams and 60 percent were not captured. The Ohio Environmental Protection Agency found similar conditions in their studies. These studies show that the ultimate origination source of a stream network in the headwater area is significant, but invisible.[1]

Even limited studies such as the above indicate that the foundations of our nation's rivers originate in vast networks of unnamed and underappreciated headwater streams that have not been located and mapped. In addition, the lack of a comprehensive inventory of streams in this category hinders the ability to determine the real importance of these streams. Based on other scientific data and knowledge, however, it is reasonable to assume that these areas and small streams are critical to the health of the entire stream network including the downstream river and lakes into which the named tributary creek eventually flows.

These example studies, documenting the extent of unmapped small streams, indicate that similar streams are likely to be significantly underestimated in the Lower Coosa River Basin. It implies that streams shown on existing stream network maps are not detailed enough to serve as a basis for complete stream management and protection. Therefore, for purposes of this study and to understand where a stream network begins the definition of a *watershed* can be recalled as *the surrounding land area that drains into a body of water, i.e., a drainage area.*

The Watershed Equation

It is commonly understood that the aquatic system is linked. The middle segments of a stream network obviously connect the upstream and downstream segments. In contrast, the relationship between the surrounding land and water is often misunderstood or ignored. The general belief is that the land, or terrestrial ecosystem, only surrounds and confines the water or aquatic ecosystem. For purposes of watershed management, of which water quality is a part, this fundamental relationship between the land and the water must be addressed and the benefits understood. Examples of two of the functions and processes critical to human well being that come from the relationship of ground and water are the natural purification of water and the processing of waste. Benefits that humans receive from the functioning interrelationship of these ecosystems are scientifically referred to as *ecosystem services* (discussed later in this chapter).

Much of the exchange between land and water occurs in the transition zone along the edges of the stream, or the channel, and the adjacent land called the *riparian zone*. The types of land cover and activity occurring in the riparian zone have a distinct effect on the water in the stream channel. For example, during a rainstorm the runoff carries various materials, bits of soil, parts of trees and insects from the land area between streams in the network to downstream channels. As the rain and flow increases, potentially to flood conditions, the amount and size of material transported downstream increases.

Water quality is a result of the relationship between the surrounding land and the stream and can be expressed in a *watershed equation*. There are three key variables in the watershed equation: (1) the amount of runoff, (2) the quality of the runoff, and, (3) the capacity of the receiving stream channel. When the landscape in a watershed is altered it is very likely that the runoff rate will increase. When this occurs, the maximum capacity of the associated stream is reached at a faster rate and more frequently. Less rain will fill the stream at a faster rate during an individual rain event because there is more runoff. Likewise, because there is more runoff the frequency at which the stream is filled increases because less water is absorbed by the adjacent land. Regardless of the reason for the increase in runoff, the additional volume of water flowing in the channel provides the power to alter the channel.

Figure 102:

The Watershed Equation

Amount of Runoff
+
Quality of Runoff
+
Stream Channel Capacity

Quality of Water

Typically, changes in land use are thought of in terms of drastic modifications such as changing undeveloped land to urban uses. Changes in the landscape, however, do not have to be nearly that drastic to have an impact on water quality. Even a forested area that experiences a forest fire changes the landscape and increases the runoff in the burned portion of the watershed. When land is converted from natural vegetation to agricultural fields the same thing occurs. A study in Wisconsin determined that when forested watersheds were converted to agricultural fields the size of floods increased. The cultivation removed larger sized vegetation that previously absorbed more of the rainfall. Cultivation also destroyed the near surface characteristics including natural air spaces created in the soil by animal burrows and the root systems of the larger vegetation. The resulting collapse of the near surface layer of soil caused more runoff as opposed to soaking into undisturbed, vegetated ground.[1]

Urbanization has a similar effect. Previously vegetated or farmed areas are converted to roof tops and paving that generate greater storm water runoff. The amount of impermeable surface (roofs, roads and parking lots) increases the volume of runoff to the extent that it is several times greater than the amount of rainwater runoff from undeveloped or agricultural land.

The location of the change in land activity within the watershed is also important. If the land activity changes occur in the upper portions of the watershed the effects are felt over a longer distance of the stream network. In addition, if the land activity change occurs in the headwater area of the watershed the impact is different because more of the small order streams are modified. The loss of the beneficial water quality ecosystem services provided by streams is discussed in more detail later in this chapter.

Any change in land activity that results in more runoff will, over time, result in changes in the stream channel. The added water volume increases the speed of the stream because deeper water has less friction with the bottom of the stream. Thus, the volume of water and rate of flow immediately increases the capacity of the receiving stream. Over time the physical changes in the stream channel may include smoothing of the streambed creating faster flows, incising the channel deeper, and straightening of the channel through bank erosion. The channel changes caused by the added volume and rate of flow enable the modified stream to carry larger volumes of water downstream more quickly. This decreases the amount of water that the channel itself can absorb so a proportionately larger amount of the already increased runoff volume is diverted downstream.

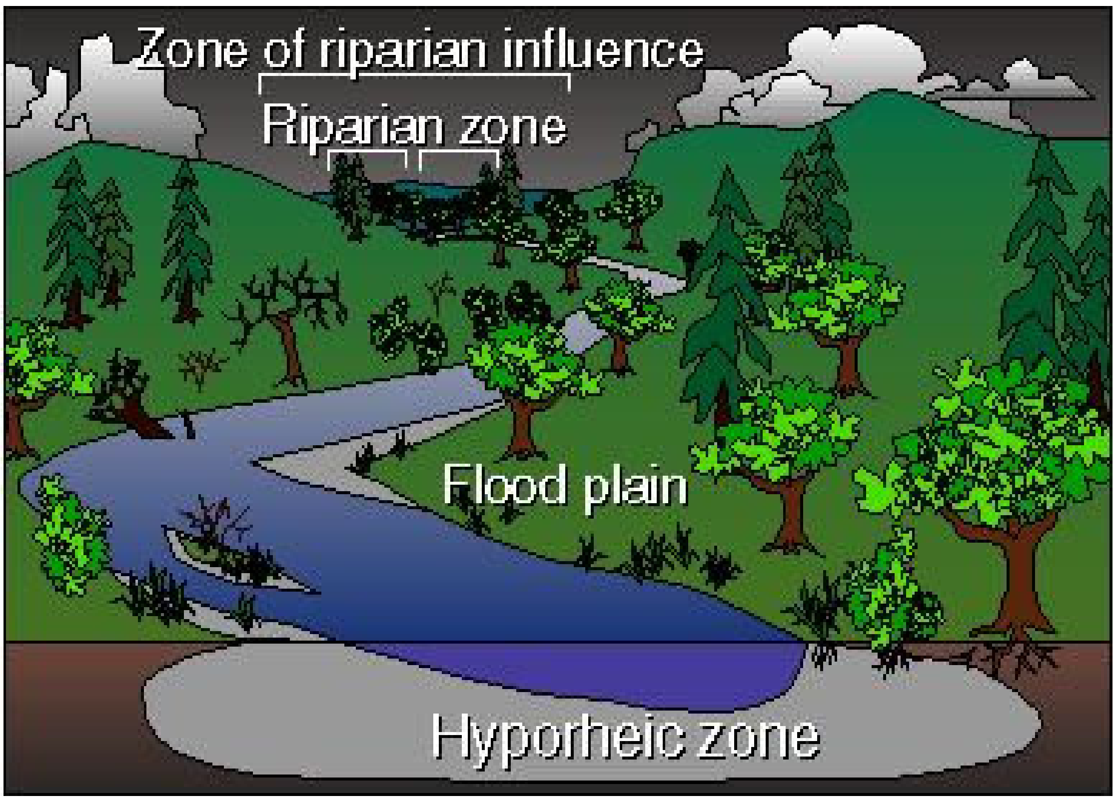
As a watershed becomes more urbanized, stormwater runoff is handled in a significantly different manner. Natural streams are replaced by storm sewers and other artificial conduits. When several smaller, rough streambeds are replaced with fewer and larger smooth surfaced conduits, a greater water volume is concentrated at a single downstream location at a faster rate. Additionally, increased outfall flow from an urban storm system results in less water soaking into the ground. One effect of this type of change is increased downstream flooding. When the urban area is located high in the watershed the effect is magnified downstream because the downstream waterway receives water from multiple other headwater areas and influences a longer distance of the stream network. Typically the downstream portions of the stream network experience bigger and more frequent flooding. A case study of the Watts Branch Creek watershed in Maryland showed that three decades of urban growth (storm sewers and paved surfaces) tripled the number of floods and increased the size of the average annual flood by 23 percent. [1]

Water and land also meet in the saturated ground adjacent to the channel and the sediments or streambed beneath the water. This area is scientifically referred to as the *hyporheic zone*. It is in this zone where the stream water makes the most intimate contact with the streambed and channel banks. It is also in this zone where much of the cleansing action and nutrient processing within a stream network occurs. This is also the zone where ground and surface water are in direct contact. Ecosystem services that occur in the hyporheic zone significantly affect water quality. Streams with extensive hyporheic zones retain and process nutrients (treat waste) efficiently. This has a positive effect on water quality and the riparian zone.

When human actions alter the extent of this relationship, including eliminating it by encasing streams in pipes and concrete channels that sever the connection between water and land, the result is poorer water quality and degraded fish habitat downstream. In addition, other ecosystem services are altered or eliminated. Also, as urban land is developed, many small streams in the overall stream network are replaced by pipes and paved drainage ditches resulting in fewer and shorter streams. For example, as the Rock Creek watershed in Maryland was urbanized it was determined that more than half the small streams were eliminated.[1]

Figure 103:

The Hyporheic Zone



Source: University of Washington; The Nature Mapping Program, Water Module. http://www.fish.washington.edu/naturemapping/water/1fldhypo.html

The watershed equation is essentially the linkage of the aquatic ecosystem with the terrestrial ecosystem. How they interact, or impact each other, is the resulting sum which is the quality of the water in the stream. And, the water quality of a stream has a direct impact on the level of beneficial ecosystem services that the stream is capable of providing. Humans are dependent upon those ecosystem services to maintain an environment that is conducive to the use of natural resources while decreasing the need for extreme treatment of resources prior to consumption or use. Ecosystems services received from the relationship of land and water affect both water quantity and water quality. Within a stream network, the ecosystem services effecting water quantity include storing water, exchanging water between ground and surface water, reducing the intensity of flow, and providing continuous flow by augmenting base flow, especially during drought periods. Within the same stream network, the ecosystem services affecting water quality include processing and the slow release of nutrients, transforming organic material, and trapping and retaining sediment.

Beneficial Water Quality Ecosystem Services

The natural processes that occur in a stream network can provide several beneficial ecosystem services for the entire watershed and aquatic system. In order to receive the ecosystem services that sustain the water quality and health of any waterway, the other stream sciences - hydrologic, hydraulic, morphology and ecologic - that interrelate with the water quality of the stream must be intact and reasonably balanced.

Materials that wash into streams include, but are not limited to, soils, leaves, dead insects and runoff from various riparian land uses such as agricultural fields, animal pastures and urban areas. One of the key water quality ecosystem services that a stream network can provide is the filtering and processing of many of these materials. Healthy aquatic systems, including balanced stream sciences, can transform many materials such as these into less harmful substances.

Processing and Slowly Releasing Nutrients. Inorganic nitrogen and phosphorous are essential nutrients for all living organisms. In excess or in the wrong proportions, however, these nutrients (chemicals) can harm both natural systems and humans. Eutrophication is the enrichment of waters by excess nutrients. Again, nitrogen and phosphorous, are two of the primary chemical causes of eutrophication. The result of eutrophication is reduced water quality in streams, rivers, lakes and other downstream water bodies such as estuaries. Typically, once eutrophication begins in a river system it moves downstream, including being transmitted through impoundments such as those present on the Coosa River, until action is taken to significantly reduce the source of excess nutrients in the stream network.

An indicator of eutrophication is the excessive growth of algae. Algal blooms reduce visibility and light, and lower the amount of dissolved oxygen in the water body. Some of the algae species that grow in eutrophic waters generate bad taste, odor or are toxic. These are clear problems for water systems using eutrophic water sources to supply drinking water systems. Nitrogen can also harm people and animals. Excess nitrogen, in the form of nitrate, has been linked to methemoglobinema ("blue baby syndrome") in infants and has toxic effects on some animals. The depletion of oxygen, if severe enough, can cause fish kills.

When compared to large streams, small streams, especially shallow ones, have proportionately more water in contact with the stream channel. More water contact with the streambed allows more natural processing or cleansing to occur. Bacteria, fungi and other microorganisms living on the bottom of the stream consume inorganic nitrogen and phosphorous and convert them into less harmful and biologically beneficial compounds. The result is that the average distance traveled by a nutrient before it is removed from the water column is shorter in a smaller stream than in larger streams. As a consequence, when small streams are lost more nutrients can enter and travel farther in the stream network. When the nutrients get into larger streams and rivers the processing rate is much slower because there is less contact between the volume of water and the stream channel. Therefore, the downstream system, particularly in larger streams and rivers, retains higher nutrient levels for longer periods. Another likely consequence is the further eutrophication of downstream rivers and lakes.

Some research examples supporting these findings include the following. One study conducted in small headwater streams in the southern Appalachian Mountains found that both phosphorous and the nitrogen containing compound ammonium traveled less than 65 feet downstream before being removed from the water. In another study, based on research in 14 headwater streams across the United States, it was shown that nitrogen entering a small stream in the headwater portion of a stream network was either retained or transformed within 1,000 yards.[1]

Based on the above principles and examples, channel shape and size play an important role in transforming excess nutrients. This was also shown in studies conducted in Pennsylvania. When forests surrounding small streams were cleared it allowed both the warming of the water and the additional light enabled meadows and grass along the stream bank. The grasses trapped sediment and created sod along the stream bank that effectively narrowed the stream channel to about one-third of the original width. The narrowing reduced the amount of streambed available for microorganisms that process nutrients. As a result, the nitrogen and phosphorous traveled downstream somewhere between five and ten times farther than they did prior to the removal of the tree cover.[1]

Wetlands also remove pollutants from surface water. A study of eight watersheds in the northeast determined that wetlands associated with first-order streams were responsible for 90 percent of the phosphorous removal in the upper watershed area.[1]

Streams do not have to be perennial (year round) to make significant contributions to water quality. Pollutants, such as fertilizers, enter stream networks during rain events producing runoff. This is the same time that ephemeral and intermittent streams are most likely to have water and be able to process nutrients in the area in contact with the ground. Although these streams are less efficient for nutrient processing, as seen in the Pennsylvania study, they still are effective for processing nutrients because large ground areas are involved. Failure to maintain the processing capacity of ephemeral and intermittent streams will reduce the ability to control nonpoint source pollution.

Transforming Organic Material. Small streams and wetlands perform another ecosystem service by transforming or recycling organic carbon contained in dead plants and animals. In freshwater ecosystems, such as those located in the Lower Coosa River Basin, much of the carbon recycling starts in wetlands and small streams in headwater areas. Like nitrogen and phosphorous, carbon is essential, but harmful if present in the wrong form or excess quantities. If all organic material went downstream in large quantities, the decomposing material would deplete the dissolved oxygen in downstream waters. This would kill fish and other aquatic life.

The natural ecological process converts inorganic carbon into organic carbon. Organic carbon is the basis for every food web on earth. The conversion provides aquatic food for many organisms including mayflies. The mayfly was one of the indicator species evaluated by the USGS sampling for baseline data in the Lower Coosa River Basin. Either due to the presence of other harmful pollutants, or the lack of proper processing in the food chain, the mayfly has disappeared from sampling sites in watersheds with higher degrees of urbanization. (See Chapter 10.)

Trapping and Retaining Sediment. Runoff from precipitation events and receding floodwaters wash soil, leaves and various other materials into the stream network. Within the stream some of the material is broken into smaller pieces. Depending on the size of the material and characteristics of the water flow, smaller parts of the sediment begin to settle out. If the natural vegetation and soil cover are disturbed by fires, farming or construction, the amount of runoff increases and more material is washed into the stream. The increased amount of runoff also increases the amount of erosion within the stream bed and banks. The increased flow and volume of water tends to carry larger pieces and volumes of sediment farther downstream. Both actions contribute additional sediment to the total stream network.

Grassy areas, small streams and wetlands in a stream network can trap and retain sediment that washes into them. The amount of sediment accrued in the stream network is dependent on the kinds of landscape cover, land uses and how the overall watershed is managed. The movement of sediment, like water flow, takes place throughout the stream network. Natural material obstructions and the bumpy bottom of the stream bed cause sediment to settle out of the water column. Therefore, intact stream networks moderate, not eliminate, the amount of sediment that is delivered to downstream portions of the stream network.

A Pennsylvania study showed that in a one year period, the urbanization of a 160 acre headwater area increased channel erosion over a one-quarter mile stretch of stream that generated an additional 50,000 cubic feet of sediment. This quantity of sediment is sufficient to fill 25 rooms approximately sized 13 feet by 19 feet with 8-foot ceilings. The same study estimated that in a non-urbanized watershed it would take about five years to produce the same amount of sediment. Such studies show that landscape and land cover changes, such as farming and urbanization, without the protection of the headwater streams and their riparian zones, cause much more sediment to travel downstream.[1]

Wetlands, whether or not they are connected to surface water, provide areas where runoff slows or stops and allows the debris it is carrying to drop out. Because headwater streams and wetlands represent a significant percentage of total stream length they can retain a substantial amount of sediment and prevent it from flowing into downstream rivers and lakes. Ephemeral streams can also retain significant amounts of sediment. These small streams expand in response to the intensity of rain. During expansion the stream flows over dry to damp ground. The leading edge of the stream, called the *trickle front,* soaks into the expanded area of the stream bed and settles out sediment at the same time.

Sediment suspended in the water column makes the water murkier and decreases the amount of sunlight that underwater plants and animals receive. In many cases the plants no longer receive adequate light to grow. Fish that depend on visual signals to mate may be less likely to spawn in murky water. High levels of sediment suspended in the water can even cause fish kills. As sediment settles on the bottom it continues to cause problems because it fills the holes and spaces between gravel and rocks and smothers the aquatic animals that live on the bottom of stream beds. This disturbs the food web. And, if heavy sediment settlement occurs during a spawning season the fish eggs are smothered.

Once sediment moves farther downstream it becomes a more expensive problem. Too much sediment fills reservoirs and navigation channels, constructs sand bars that prohibit access to tributaries from the main channel, eliminates recreational and sport fishing, harms aquatic habitats (including associated plants and animals) and increases water filtration and purification costs for municipalities and industries.

The ability of small streams and wetlands, especially in headwater areas, to process and transform organic manner helps to maintain water quality and healthy downstream ecosystems. By maintaining these same attributes and managing the riparian zone, the amount of sediment can be controlled to maintain the health of the stream network.

Beneficial Water Quantity Ecosystem Services

As stated earlier, the four beneficial ecosystem services related to water quantity that streams and wetlands can provide include storing water or flood control, reducing the intensity of flow, exchanging water between ground and surface water, and providing base flow augmentation or continuous flow. Although the focus of this plan is the water quality of the Lower Coosa River Basin, water quantity within the basin has a direct impact on water quality.

Flood Control. Occasional flooding is a natural function of every stream network. Floodwaters perform beneficial services such as carrying sediment and nutrients downstream to other parts of the watershed. While providing some positive benefits, floods can also destroy farms, structures (houses, businesses and others), roads and bridges.

Human impacts in the watershed, including the landscape of the riparian zone or changes in the stream channel, can result in larger and more frequent flooding. As discussed earlier in the Watershed Equation section of this chapter, stream channels that carry low volumes of water, especially if the flowing water is shallow, and having slower rates of flow afford the greatest opportunity for the ground or streambed to absorb the most water. When small streams, including ephemeral and intermittent streams and wetlands are in their natural state they absorb significant amounts of rainwater and runoff before they overflow themselves. This is especially true in the upper portions of a watershed where significant lengths of small streams are located.

Reducing the Intensity of Flow. A natural streambed does not have a smooth surface like a concrete drainage ditch or pipe. The roughness of a natural streambed slows the passage of water. In smaller streams the friction produced by the streambed (gravel, rocks, pools and dams composed of natural materials) slows the flow of water as it moves downstream.

Slower moving water also causes less erosion and carries less sediment and debris downstream.

Exchanging Ground and Surface Water. During wet and dry periods the exchange of water between ground and surface water resources reverses. During wet periods the exchange is from surface water to groundwater. In dry periods the exchange is from groundwater to surface water. This latter process is more fully discussed in the next section – Providing Flow Augmentation.

Small streams and wetlands in a stream network play an important role in groundwater recharge. As discussed, the smaller, upstream components of a network collectively have the largest area of surface contact between land and water. This expansive area of contact provides the greatest opportunity for surface water, whether from precipitation or stream flow, to recharge groundwater. During periods of rainfall when ephemeral and intermittent streams contain water, the contact area between land and water increases. This increases the opportunity to recharge groundwater during rainstorms. In addition, the elevation of streams located in the headwater area is typically higher than the water table, thereby providing the opportunity for water to easily flow through the soil or channel bed and recharge groundwater.

Slower moving water is more likely to seep into a stream's natural storage system of banks and channel beds (hyporheic zone) and recharge the groundwater. Wetlands that have permanent water and ephemeral wetlands that retain water for a period of time also provide opportunities to recharge groundwater. When a change occurs in the landscape, such as timber harvesting or structural construction, in the riparian zone, it typically increases the amount of precipitation runoff into a stream as opposed to infiltrating to groundwater. The consequence is less overall groundwater recharge and, in essence, the recharge process gets short circuited.

Providing Flow Augmentation. During dry periods, the exchange is from groundwater to stream water. Groundwater is returned to local streams through the streambed to sustain a relatively continuous flow in moderately dry periods and to augment the base flow during periods of drought. Because of these interchanges, groundwater can provide a significant portion of surface water flow in streams and rivers. In fact, the USGS estimates that, nationwide, 40 to 50 percent of water in large streams and rivers comes from groundwater.[1] In dry seasons or during drought periods as much as 95 percent of stream flow may come from groundwater. In Alabama, the base flow contribution from groundwater ranges from 20 percent to over 50 percent depending on the physiographic province and geology of the watershed and stream, according to the Water Division of ADEM.

Small streams and wetlands in a stream network play a crucial role in providing a continual flow of water. As previously noted, water in streams and rivers comes from several sources: precipitation, other streams, groundwater and water held in soil. During dry periods, the small streams in the headwater areas provide the opportunity to recharge groundwater supplies that can be released to the stream flow. Wetlands associated with surface water bodies can also directly release water from the larger geographic areas they cover to maintain stream flow as wetland water levels decline. Even wetlands, without an apparent connection to surface water, are involved in providing a continual flow of water by storing and slowly releasing water into groundwater that eventually resurfaces through springs and stream channels.

Because of the role of small streams and wetlands in maintaining continuous and base flow it is important to protect them. By maintaining water levels in local streams throughout the watershed, the aquatic ecosystems are properly supported and water is supplied for various beneficial uses located in the watershed. When groundwater recharge is short circuited, there is less water available to recharge stream flow during dry to drought periods. The effect in the watershed is offset in time. Typically, the shortage of surface water is not associated with the earlier actions that reduced the ability to recharge groundwater resources.

The recharge process of stream networks that are functionally intact moderates flooding in times of high water and maintains flow during dry periods. Likewise they can reduce the intensity of stream flow. Alterations to stream networks and wetlands can disrupt the present and future quantity of water available in the stream and river system.

In this chapter, water quality has been discussed and explained in terms of a scientific discipline, as part of a system or network, as a factor in a equation, and as a provider of beneficial ecosystem services. By now, it should be clear that water quality is much more than an adjective or descriptive noun. It is a result of the integration of numerous processes and systems. Because of this integration, it should also now be clear that maintaining the water quality of the Lower Coosa River Basin cannot be solved with one or two remedial actions. Instead, maintaining good water quality will only occur as the result of the integration of numerous initiatives by the inhabitants of the basin acting in their own watersheds.

Source Documents:

1. American Rivers and Sierra Club, with funding from The Turner Foundation. *Where Rivers Are Born: The Scientific Imperative for Defending Small Streams and Wetlands.* Judy L. Meyer, PhD, Louis A Kaplan, PhD, Denis Newbold, PhD, David L. Strayer, PhD, Christopher J. Woltemade, PhD, Joy B. Zedler, PhD, Richard Beilfuss, PhD, Quentin Carpenter, PhD, Ray Semlitsch, PhD, Mary C. Watzin, PhD, Paul H. Zedler, PhD. September 2003.

Chapter 9
Types and Sources of Pollution

In simplest terms, impaired waters are those that have high levels of pollution from one or more sources. And, at the most basic level, there are two sources of water pollution: point source pollution and nonpoint source pollution. For the most part, this plan deals only with nonpoint source pollution. The two sources, however, are not completely extricable and an examination of one source must include the impacts from and on the other source.

Point Source Pollution

Point source pollution enters waterways from discrete, identifiable locations that have been subject to regulation since the passage of the Clean Water Act in 1972. These types of discharges include municipal wastewater treatment plants and other businesses or industries that discharge treated waste effluent into waterways. These sources are regulated by the Alabama Department of Environmental Management (ADEM) through the allocation of waste loads between the users, or dischargers. In other words, ADEM allows an entity to discharge a specified amount of water back into the Coosa River after treatment has cleansed the water enough to meet the water quality requirements. ADEM regulates water discharges through the National Pollutant Discharge Elimination System (NPDES) permit system. The NPDES permit program was established under Section 402 of the Clean Water Act, which prohibits the unauthorized discharge of pollutants from a point source (pipe, ditch, well, etc.) to U.S. waters, including municipal, commercial, and industrial wastewater discharges and discharges from large animal feeding operations. The State of Alabama was authorized to implement its NPDES Permit Program in October 1979 and in June 1991 was authorized to implement a General Permits Program. Permittees must verify compliance with permit requirements by monitoring their effluent, maintaining records, and filing periodic reports.

The waste load allocation of permitted dischargers is calculated in such a manner as to maintain the water quality of the receiving stream. However, it is possible to fully allocate a stream segment so that no new point source discharges are allowed unless or until other permits are reissued with more stringent requirements to free up a portion of the waste load allocation for new users. As outlined in Part II: Water Uses in the Lower Coosa River Basin, as of September 2003, there are 337 permitted dischargers in the Lower Coosa River

Basin, of which eight are municipal water treatment systems, 22 are municipal wastewater treatment plants, 147 are industrial permits, 13 are mining operations, and 102 are storm water runoff permits, according to lists from the ADEM databases. The storm water permits are generally short term permits for construction sites and dirt pits. As such, the number of permits and their locations change rapidly. There are no permitted concentrated animal feeding operations (CAFO) in the Lower Coosa River Basin.

Even with point source dischargers being regulated to meet water quality standards, streams across the nation have failed to attain desired water quality levels. Therefore, attention has been turned to nonpoint sources of pollution.

Nonpoint Source Pollution

EPA defines nonpoint source pollution as pollution caused by sediments, nutrients and organic and toxic substances originating from land use activities and/or from the atmosphere, which are carried to receiving waters by runoff at a rate that exceeds natural levels. In other words, nonpoint source pollution comes from diffuse, intermittent or mobile sources. While the impact of each individual source is perceived by the public as being small, the cumulative effect is significant. That is why awareness needs to be created in all citizens. It is the collective, individual actions of residents in any given watershed that can have a significant impact on water quality. The effect on water quality is not only felt locally, but also by downstream users and ultimately in the bays and oceans that major river systems drain into.

Nonpoint source pollution remains the nation's largest source of water quality problems, not only impacting water quality, but ultimately cycling back to impact local economies. When local water quality is not maintained, the cost of treating water to meet drinking water standards increases. Likewise, as local waters become more degraded, the standards for point source dischargers are increased and additional treatment processes must be added before effluent can be returned to local streams. In both cases, the increased cost of treating water to make it potable or treating discharges to meet local stream water quality standards, the cost is ultimately passed on to the consumers or the citizens of the watershed.

The originators of nonpoint source pollution are the residents of the watershed and their actions on the land surrounding the water bodies. This type of pollution is widespread because it can occur any time activities occur on the land that disturbs the land or water. Agriculture, forestry, grazing, septic systems, recreational boating, urban runoff, construction, physical changes to stream channels, and habitat degradation are all potential sources of nonpoint source pollution. Careless or uninformed household or business management also contributes to nonpoint source pollution problems. According to EPA's *Nonpoint Source Pointers Factsheets*, the most common nonpoint source pollutants are sediment and nutrients. These wash into water bodies from agricultural land, small and medium-sized animal feeding operations, construction sites, and other areas of disturbance, if best management practices are not implemented. Other common nonpoint source pollutants include pesticides, pathogens (bacteria and viruses), salts, oil, grease, toxic chemicals, and heavy metals. The Alabama Nonpoint Source Education for Municipal Officials Program offers the following brief explanation of the causes and effects of the major types of pollutants carried by runoff:

Pathogens: Pathogens are disease-causing microorganisms, such as bacteria and viruses, that come from the fecal waste of humans and animals. Exposure to pathogens, either from direct contact with water or through ingestion of contaminated raw shellfish, can cause a variety of illnesses. Because of this, beaches and shellfish beds are closed to the public when testing reveals significant pathogen levels. Pathogens wash off the land from wild animal, farm animal, and pet waste, and can also enter our waterways from improperly functioning septic tanks, leaky sewer lines and boat sanitary disposal systems.[1]

Nutrients: Nutrients are compounds that stimulate plant growth, like nitrogen and phosphorous. Under normal conditions, nutrients are beneficial and necessary, but in high concentration, they can become an environmental threat. Nitrogen contamination of drinking water can cause health problems, including "blue baby" syndrome. Over-fertilization of ponds, bays and lakes by nutrients can lead to massive algal blooms, the decay of which can create odors and rob the waters of life-sustaining dissolved oxygen. Nutrients in polluted runoff can come from agricultural fertilizers, failing septic systems, home lawn care products, and yard and animal wastes. The two most common types of nutrients are phosphorous and nitrogen. Major sources of phosphorous reaching water bodies are runoff from failing septic systems, fertilizers, leaves, animal waste and urban runoff.[1]

***Sediment*:** Sand, dirt and gravel eroded by runoff often end up in stream beds, ponds or shallow coastal areas, where they can alter stream flow and decrease the availability of healthy aquatic habitat. Poorly designed construction sites, agricultural fields, unpaved roadways and eroding road banks, and suburban gardens can be major sources of sediment when appropriate best management practices have not been installed.[1]

***Toxic Contaminants*:** Toxic contaminants are substances that can harm the health of aquatic life and/or human beings. These contaminants are created by a wide variety of human practices and products, and include heavy metals, pesticides, and organic compounds like PCBs. Many toxins are very resistant to breakdown and tend to be passed through the food chain to be concentrated in top predators. Fish consumption health advisories are the result of concern over toxins. Oil, grease and gasoline from roadways, and chemicals used in homes, gardens, yards, and on farm corps, are also major sources of toxic contaminants.[1]

***Debris*:** Trash is without doubt the simplest type of pollution to understand. It interferes with enjoyment of our water resources and, in the case of plastic and Styrofoam, can be a health threat to aquatic organisms. Typically this debris starts as street litter that is carried by runoff into our waterways.[1] Debris also includes illegal dumping of large unwanted household trash, such as tires, refrigerators and other appliances.

Thermal Pollution: Water temperature affects aquatic habitat even in the absence of other pollution. Fish and other species are sensitive to temperature and inhabit areas where the temperature falls within their preferred range. Cooler water also retains more oxygen. Two of the primary causes of thermal pollution are increases in the amount of pervious surfaces in a watershed (rooftops, paving) and the removal of trees, which provide shade, from streambanks.

Nonpoint source pollution can often be prevented or decreased with the application of best management practices, or BMPs. Best management practices are a combination of management, cultural, and structural practices that various industries and agencies determine to be the most effective and economical way of controlling runoff problems without disturbing the quality of the environment. Minimizing raindrop impact on the soil and reducing runoff and runoff velocities are three main objectives that are taken into consideration when saving endangered fields or land. Most industries and their industry-related agencies and associations have developed steps that can be taken to control runoff specific to their particular field, such as agricultural BMPs and silviculture BMPs.

Nonpoint Source Pollution in the Lower Coosa River Basin

During the first phase of education and awareness for the development of the Lower Coosa River Basin Management Plan, a survey was distributed to approximately 440 residents at a series of local government meetings between November 2003 and January 2004, which listed eight categories of nonpoint source pollution and asked respondents which categories are perceived to be the most common types of nonpoint source pollution and which are perceived to be the most harmful to water quality. The eight categories listed were urban runoff, agricultural runoff from crops, agricultural runoff from livestock and poultry, silviculture runoff, sedimentation, failing onsite septic systems, water-related recreational activities, and illegal dumping. Response to the survey, which had an approximate 10 percent response rate, showed that the majority of respondents, at 56.3 percent, felt that urban runoff was the most common type of nonpoint source runoff. Urban runoff was followed by agricultural runoff from crops and failing septic systems, each at 43.8 percent, illegal dumping at 34.4 percent, and by sedimentation and agricultural runoff from livestock and poultry, each at 31.3 percent. Respondents felt that of the eight categories listed, silviculture (timber cutting) and water-related recreational activities were the least common types of nonpoint source pollution.

In terms of having the most harmful impacts on water quality, respondents stated that urban runoff and failing onsite septic systems were the most harmful. In 1996, EPA produced a series of fact sheets, called *Nonpoint Source Pointers,* with each fact sheet focusing on a different type of nonpoint source pollution. The following explanation of the eight categories of nonpoint source pollution used in the citizen survey includes excerpts of information from those fact sheets. Although somewhat dated in terms of statistical analysis, the fact sheets remain a good nonpoint source primer for explanatory information and basic management actions.

Urban Runoff. Nonpoint source pollution from urban runoff occurs when water flows over urban surfaces into storm drains that empty into nearby creeks, streams and rivers. The porous and varied terrain of natural landscapes like forests, wetlands, and grasslands trap rainwater and/or snowmelt and allow it to slowly filter into the ground. Runoff tends to reach receiving waters gradually. In contrast, nonporous urban landscapes like roads, bridges, parking lots, and buildings don't let runoff slowly percolate into the ground. Water remains above the surface, accumulates, and runs off in large amounts.

Cities install storm sewer systems that quickly channel this runoff from roads and other impervious surfaces. Runoff gathers speed once it enters the storm sewer system. When it leaves the system and empties into a stream, large volumes of quickly flowing runoff erode streambanks, damage streamside vegetation, and widen stream channels. In turn, this will result in lower water depths during non-storm periods, higher than normal water levels during wet weather periods, increased sediment loads, and higher water temperatures. Native fish and other aquatic life sensitive to these changes cannot survive in streams severely impacted by urban runoff.[2]

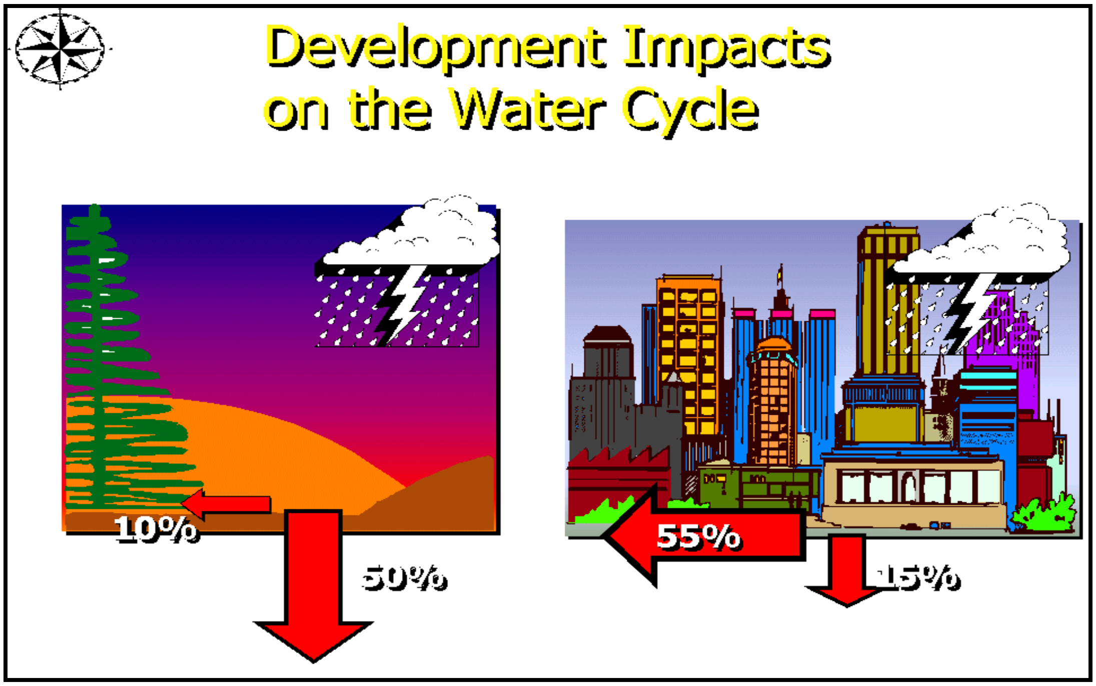
Figure 104:

Urban Runoff

Urbanization also increases the variety and amount of nonpoint source pollution. Sediment from development and new construction; oil, grease, and toxic chemicals from automobiles; nutrients and pesticides from turf management and gardening; viruses and bacteria from failing septic systems and pet waste; and heavy metals are examples of pollutants generated in urban areas. Sediments and solids constitute the largest volume of pollutant loads to receiving waters in urban areas. When runoff enters storm drains, it carries many of these pollutants with it. Increased pollutant loads can harm fish and wildlife populations, kill native vegetation, foul drinking water supplies, and make recreational areas unsafe.[2]

Many urban streams have limited value for recreational use and wildlife habitat because of poor water quality resulting from nonpoint (street and land) runoff and thermal pollution. Many of the pollutants found in urban runoff come from roadways and parking lots. The Environmental Protection Agency has found an average of 1,400 pounds of loose material on each mile of roadways in urban areas. It was also determined that 78 percent of the loose material was located within six inches of the curb; the same area where stormwater runoff is collected and directed to storm inlets. Industrial areas have the highest amount. Contrary to land use intensity patterns, central business districts were found to have the lowest amounts of loose material.[2]

Figure 105:



Infiltration of stormwater on an undisturbed landscape is around 50 percent, while stormwater runoff is around 10 percent. When a landscape is hardened by *impervious surfaces* such as roads, roofs, and parking lots, approximately 55 percent of stormwater is lost to runoff and only around 15 percent infiltrates.

Source: Alabama Department of Environmental Management, Nonpoint Source Education for Municipal Officials. http://www.aces.edu/waterquality/nemo/intro.htm

EPA studies have determined that runoff quality is not just a function of rainfall intensity and depth, but is directly related to how the land is used. The primary problem in urban runoff, often exceeding USEPA standards, is heavy metals. The concentrations were often in excess of levels that could cause long term harm to animals and plants. In addition, concentrations of coliform bacteria occurring in runoff during storms often exceeded the levels permitted in drinking water.[2]

Streets, bridges, parking lots and rooftops are not the only source of nonpoint source pollution from urban runoff. Careless or uninformed household management is also a major contributor to urban runoff problems as people often forget about water pollution caused at the household level. Common causes of polluted urban runoff at the household level includes impervious surfaces such as driveways, rooftops and patios just as in urban centers, lawn and garden fertilizers, excessive lawn watering, pesticides, and improper disposal of household cleaners, grease, oil, paint, and other chemicals.[2]

Failing Septic Systems. One of the most significant causes of nonpoint source pollution at the household level is failing septic systems, in both urban and rural settings. Malfunctioning or overflowing septic systems release bacteria and nutrients into the water, contaminating nearby lakes, streams, and estuaries, and groundwater. Septic systems must be built in the right place. Trampling ground above the system compacts soil and can cause the systems pipes to collapse. Also, septic systems should be located away from trees because tree roots can crack pipes or obstruct the flow of wastewater through drain lines. Proper septic system management is also important, and a system should be inspected and emptied every 3 to 5 years. Household cleaners, grease, oil, plastics, and some food or paper products should not be flushed down drains. Over time chemicals can corrode septic system pipes and might not be completely removed during the filtration process. Chemicals poured down the drain can also interfere with the chemical and biological breakdown of the wastes in the septic tank.[2]

Figure 106:

Signs of Failing Septic Systems

Signs of failing septic systems can include sewage surfacing on the ground on or near drainfield or septic tanks and spongy ground on or near drainfield, as shown in this picture from Talladega County.

Source: Alabama Department of Public Health

In the 1999 Watershed Assessment of the watersheds in Coosa River basin, conducted by the Alabama Soil and Water Conservation Committee, it was estimated that there are 16,220 septic systems in the Lower Coosa River Basin, of which approximately 6.2 percent are failing. This is a low estimate and may be much higher because there were no septic system estimates made for Talladega County in the Watershed Assessment. For the most part, the density of septic tanks throughout the Lower Coosa River Basin is low. Those watersheds that have the highest number of septic systems are Yellowleaf Creek and Beeswax Creek, both of which are located in Shelby County. In the Beeswax Creek watershed, the density of septic systems is highest at .08 tanks per acre, or approximately 12 acres per septic tank. The watershed with the second highest proportion of septic systems is the Spring Creek watershed, which has .07 septic systems per acre or 14.5 acres per septic tank. Spring Creek is located just south of Beeswax Creek, also in Shelby County. The proximity of these two watersheds to the Coosa River and the other significant growth and development that is occurring in this area sends warning flags about the quality of the water in those watersheds.[3]

Illegal Dumping. Another nonpoint source pollution problem stemming from households is illegal dumping, which is the disposal of waste in an unpermitted area, such as a back area of a yard, a stream bank, or some other off-road area. Illegal dumping can also be the pouring of liquid wastes or disposing of trash down storm drains. It is often called "open dumping," "fly dumping" and "midnight dumping" because materials are often dumped in open areas, from vehicles along roadsides, and late at night. Illegally dumped wastes are primarily nonhazardous materials that are dumped to avoid paying disposal fees or expending the time and effort required for proper disposal. Illegally dumping wastes down storm drains and creating illegal dumps, however, can impair water quality. Runoff from dumpsites containing chemicals can contaminate wells and surface water used as sources of drinking water. Substances disposed of directly into storm drains can also lead to water quality impairment. In systems that flow directly to water bodies, those illegally disposed-of substances are introduced untreated to the natural environment.

Figure 107:

Illegal Dumping
in the Lower Coosa River Basin

Illegal dumping can range from the tire found in a stream (top right) to full roadside dumps (below), both of which were found near Shirtee Creek in Talladega County. The bottom right photograph is of a car hidden in the trees near Hatchet Creek in Coosa County.

Source: Alabama Department of Public Health and Delaney Consultant Services, Inc.

Agricultural Runoff. There are approximately 275,131 acres of agricultural land in the Lower Coosa River Basin (22 percent of the total land area), representing a significant potential for water pollution from agricultural runoff if best management practices are not implemented. In general, agricultural activities that cause nonpoint source pollution include confined animal facilities, grazing, plowing, pesticide spraying, irrigation, fertilizing, planting, and harvesting. The major nonpoint source pollutants that result from these activities are sediment, nutrients, pathogens, pesticides, and salts. Agricultural activities also can damage habitat and stream channels.[2]

Sedimentation occurs when wind or water runoff carries soil particles from an area, such as a farm field, and transports them to a water body, such as a stream or lake. Excessive sedimentation clouds the water, which reduces the amount of sunlight reaching aquatic plants; covers fish spawning areas and food supplies; and clogs the gills of fish. In addition, other pollutants like phosphorus, pathogens, and heavy metals are often attached to the soil particles and wind up in the water bodies with the sediment. Nutrients such as phosphorus, nitrogen, and potassium in the form of fertilizers, manure, sludge, irrigation water, legumes, and crop residues are applied to enhance crop production. When applied in excess of plant needs, nutrients can wash into aquatic ecosystems where they can cause excessive plant growth, which reduces swimming and boating opportunities, creates a foul taste and odor in drinking water, and may cause fish kills.

Irrigation water is applied to supplement natural precipitation or to protect crops against freezing or wilting. Inefficient irrigation can cause water quality problems. In arid areas, for example, where rainwater does not carry residues deep into the soil, excessive irrigation can concentrate pesticides, nutrients, disease-carrying microorganisms, and salts-all of which impact water quality-in the top layer of soil.[2]

Pesticides, herbicides, and fungicides are used to kill pests and control the growth of weeds and fungus. These chemicals can enter and contaminate water through direct application, runoff, wind transport, and atmospheric deposition. They can kill fish and other wildlife, poison food sources, and destroy the habitat that animals use for protective cover.[2]

Overgrazing exposes soils, increases erosion, encourages invasion by undesirable plants, destroys fish habitat, and reduces the filtration of sediment necessary for building stream banks, wet meadows, and floodplains.[2]

Figure 108:

Cotton Harvesting

Source: Photo Courtesy of USDA NRCS.

By confining animals to areas or lots, farmers and ranchers can efficiently feed and maintain livestock. But these confined areas become major sources of animal waste. Runoff from poorly managed facilities can carry pathogens (bacteria and viruses), nutrients, and oxygen-demanding substances that create the potential for major water quality problems. Groundwater can also be contaminated by seepage.[2]

As of August 2003, there were no registered concentrated animal feeding operations that have been permitted in the Lower Coosa River Basin. The 1999 Watershed Assessments, conducted by the Alabama Soil and Water Conservation Committee and NRCS, shows that there are no poultry operations located within the basin, however, 6,681 broilers were reported in Talladega County in the *Alabama Agricultural Statistics, 2002*. (The exact location within Talladega County is unknown.) There are a limited number of cattle, swine and catfish farms present, as well. Only 259 of the total 31,535 cattle are dairy cattle. The watersheds with the highest amount of cattle are Walnut Creek with 7,700, and Tallaseehatchee Creek with 3,705 cattle. The amount of swine in the watershed is nearly negligible with 731 total. There are 2,154 acres of land/ponds in catfish production, with the highest amounts being located in the Tallaseehatchee Creek watershed, at 900 acres, distantly followed by Cedar Creek, at 300 acres.[3]

Figure 109:

Agricultural Animals by Lower Coosa River Watersheds, 1999

Watershed Name	# of Cattle in Watershed	# of Dairy Cows in Watershed	# of Swine in Watershed	# of Broilers in Watershed	# of Layers in Watershed	# of Catfish Acres in Watershed	Total Animals in Watershed
Tallaseehatchee Creek	3,705	250	330	0	0	900	5,185
Walthall Branch	1,200	0	0	0	0	0	1,200
Yellowleaf Creek	2,940	0	0	0	0	20	2,960
Kahatchee Creek	540	0	8	0	0	150	698
Beeswax Creek	2,000	0	0	0	0	0	2,000
Cedar Creek	1,080	0	80	0	0	300	1,460
Peckerwood Creek	660	0	8	0	0	170	838
Spring Creek	700	0	0	0	0	5	705
Buxahatchee Creek	1,150	0	0	0	0	12	1,162
Waxahatchee Creek	2,310	0	0	0	0	9	2,319
Upper Hatchet Creek	885	0	0	0	0	78	963
Socapatoy Creek	600	0	0	0	0	64	664
Middle Hatchet Creek	870	0	0	0	0	60	930
Weogufka Creek	2,460	0	55	0	0	200	2,715
Lower Hatchet Creek	0	0	0	0	0	90	90
Walnut Creek	7,700	0	0	0	0	20	7,720
Chestnut Creek	1,305	0	250	0	0	6	1,561
Weoka Creek	1,430	9	0	0	0	70	1,509
Pigeon Roost Creek	0	0	0	0	0	0	0
Taylor Creek	0	0	0	0	0	0	0
Total in All Watersheds	31,535	259	731	0	0	2,154	34,679

Source: Alabama Soil and Water Conservation Committee, Alabama Watershed Assessment, 1999. Watershed Statistics. http://www.swcc.state.al.us

Soil Erosion and Sedimentation. Soil erosion, within a stream channel is a natural process. A stream carries a specified amount of stream bed erosion or sediment. When the amount of sediment varies from the normal sediment load either aggradation or degradation occurs. Aggradation is when the amount of sediment in the stream exceeds the capacity to transport sediment. The excess sediment settles out and fills the channel with deposits. This decreases the sediment load to balance with the carrying capacity of the stream. Degradation is when the amount of sediment is lower than the carrying or sediment transport capacity of the stream. The scouring action of the flowing water picks up sediment by eroding the bed or stream banks to balance the carrying capacity of the stream.[2]

Although soil erosion is a natural process, it can be greatly accelerated when soil is disturbed by construction, urbanization, farming and forestry and best management practices are not implemented. Soil erosion is one of the major sources of nonpoint source pollution (sediment). As referenced in the discussion of landscape changes in the riparian zone, even events like a forest fire, a land cover change without a subsequent land use change, can increase soil erosion. The various types of erosion, whether individually or in combination, can result in sediment loads in streams being unnaturally high when compared to natural carrying capacity of the stream. As discussed in the channel changes section, the delivery of increased runoff to a stream will accelerate the speed of the water and cause channel changes. These changes include bank erosion and smoothing, eroding or incising of the streambed. These actions all increase the sediment load in the downstream waterways.[2]

Figure 110:

Sediment Runoff

Soil erosion and runoff from unpaved roads and bare lands results in a sedimentation buildup in stream beds as in these pictures taken in Shelby County.

Source: Photographs by Tracy P. Delaney, AICP. July 2003.

In the mid 1970's the former Soil Conservation Service (now NRCS, Natural Resources Conservation Service) began to inventory erosion and sediment conditions. NRCS also became more involved in controlling erosion in areas undergoing development as opposed to restricting their activities to traditional agricultural areas. As a result of these activities, NRCS is now able to provide soil erosion estimates for each watershed in the Lower Coosa River Basin. The most recent assessment was conducted in 1999, and shows that land use activities in the Lower Coosa River Basin produce more than 5.3 million tons of sediment each year. Approximately half of the total sediment comes from one category—developing urban lands, at more than 2.6 million tons annually. Distantly following developing urban lands is woodlands sediment, producing 510,775 tons per year. According to the 1999 assessment, watersheds producing the most total sediment per year are the Taylor Creek watershed, at 795,004 tons; the Beeswax Creek watershed, at 736,927 tons; and the Yellowleaf Creek watershed, at 697,195 tons. Together, these three watersheds produce over half of the sediment derived from developing urban lands, at more than 1.8 million tons per year. Located within the three watersheds are the municipalities of Chelsea, Columbiana, Harpersville, Pelham, Wetumpka and Wilsonville.[3]

Figure 111:

Annual Sediment Produced in Lower Coosa River Basin by Watershed, 1999

Watershed	Cropland Sediment (Tons)	Sand & Gravel Pits Sediment (Tons)	Mined Land Sediment (Tons)	Developing Urban Land Sediment (Tons)	Gullies Sediment (Tons)	Critical Areas Sediment (Tons)	Streambanks Sediment (Tons)	Dirtroads & Road banks Sediment (Tons)	Woodland Sediment (Tons)	Total (Tons)
Tallasseehatchee Creek	7,929	14,000	18,000	80,000	2,800	36,750	37,800	119,610	43,819	360,708
Walthall Creek	2,835	0	0	60,000	0	14,000	600	9,000	1,299	87,734
Yellowleaf Creek	14,175	16,450	12,060	456,000	0	157,500	840	15,000	25,170	697,195
Kahatachee Creek	1,329	14,000	9,000	64,000	17,500	24,000	58,000	2,508	2,565	192,902
Beeswax Creek	2,100	17,500	6,000	611,000	0	85,000	300	7,500	7,527	736,927
Cedar Creek	10,481	28,000	60,000	40,000	0	9,000	43,500	3,600	6,239	200,820
Peckerwood Creek	388	7,000	18,000	4,000	3,640	7,250	25,440	9,780	20,616	96,114
Spring creek	945	0	0	132,000	0	25,500	1,100	12,000	30,843	202,388
Buxahatchee Creek	3,555	15,750	45,000	169,500	51,800	21,500	5,750	24,000	21,724	358,579
Waxahatchee Creek	3,000	205,450	90,000	136,800	24,150	8,625	4,500	23,100	31,890	527,515
Upper Hatchet Creek	68	0	18	2,000	2,520	23,600	42,300	45,360	49,127	164,993
Socapatoy Creek	0	0	0	4,000	2,520	2,500	19,200	2,940	15,750	46,910
Middle Hatchet Creek	0	0	0	0	6,720	10,000	20,400	5,640	80,850	123,610
Weogufka Creek	878	1,400	900	80	12,740	10,375	48,600	9,780	2,726	87,479
Lower Hatchet Creek	0	0	0	400	840	500	3,600	4,020	51,600	60,960
Walnut Creek	27,338	22,750	0	24,000	29,400	6,750	17,000	45,000	54,000	226,238
Chestnut Creek	22,125	3,500	0	72,300	44,100	10,875	9,057	24,927	12,173	199,057
Weoka Creek	7,748	0	30	30,000	2,520	40,000	21,720	2,606	40,588	145,212
Pigeon Roost Creek	1,422	0	0	30,000	4,900	0	618	70	2,302	39,312
Taylor Creek	2,801	0	0	750,000	24,500	7,500	78	158	9,967	795,004
Total	109,117	345,800	259,008	2,666,080	230,650	501,225	360,403	366,599	510,775	5,349,657

Source: Alabama Soil and Water Conservation Committee, Alabama Watershed Assessment, 1999. Watershed Statistics. http://www.swcc.state.al.us

Silviculture. Nearly 500 million acres of forested lands are managed for the production of timber in the United States. Although only a very small percentage of this land is harvested each year, forestry activities can cause significant water quality problems if improperly managed. It is estimated that there is 977,965 acres of forested land in the Lower Coosa River Basin, which is between 77.82 percent and 81.48 percent of the total basin land area. Of the total forested land, approximately 40.58 percent is deciduous, or natural, forest. The remaining 59.42 percent is either mixed forest or evergreen forest, both of which are generally cultivated for timber production. As stated in Chapter 5, cash receipts for 2001 from forest products in Chilton, Coosa, Elmore, Shelby and Talladega Counties combined was almost $37 million.

Sources of nonpoint source pollution associated with forestry activities include removal of streamside vegetation, road construction, maintenance and use, timber harvesting, and mechanical preparation for the planting of trees. Road construction and road use are the primary sources of nonpoint source pollution on forested lands, contributing up to 90 percent of the total sediment from forestry operations. Harvesting trees in the area beside a stream can affect water quality by reducing the streambank shading that regulates water temperature and by removing vegetation that stabilizes the streambanks. These changes can harm aquatic life by limiting sources of food, shade, and shelter.[2] Limbs and other trimmings dumped into streams from harvesting operations can also foul the water by adding excessive organic matter and robbing it of oxygen.

Most detrimental effects of timber harvesting are related to the access and movement of vehicles and machinery, and the dragging and loading of trees or logs. These effects include soil disturbance, soil compaction, and direct disturbance of stream channels. Poor harvesting and transport techniques can increase sediment production by 10 to 20 times and disturb as much as 40 percent of the soil surface. In contrast, careful logging disturbs as little as 8 percent of the soil surface.[2]

Figure 112:

Logging Roads for Silviculture in the Lower Coosa River Basin

Photo Courtesy of Delaney Consultant Services, Inc. July 2003.

Water-Related Recreational Activities. There are three lakes in the Lower Coosa River Basin offering abundant opportunities for water-related recreational activities for both residents and visitors to the area. Most of these activities are boat-oriented. Individual boats and marinas usually release only small amounts of pollutants. Yet, when multiplied by thousands of boaters and marinas, they can cause distinct water quality problems in lakes, rivers, and coastal waters. The U.S. Environmental Protection Agency has identified the following potential environmental impacts from boating and marinas: high toxicity in the water; increased pollutant concentrations in aquatic organisms and sediments; increased erosion rates; increased nutrients, leading to an increase in algae and a decrease in oxygen (eutrophication); and high levels of pathogens. In addition, construction at marinas can lead to the physical destruction of sensitive ecosystems and bottom-dwelling aquatic communities.[2]

Water pollution from boating and marinas is linked to several sources. They include poorly flushed waterways, boat maintenance, discharge of sewage from boats, storm water runoff from marina parking lots, and the physical alteration of shoreline, wetlands, and aquatic habitat during the construction and operation of marinas. When caring for boats, a significant amount of solvent, paint, oil, and other pollutants potentially can seep into the groundwater or be washed directly into surface water. The chemicals and metals in antifouling paint can limit bottom growth. Many boat cleaners contain chlorine, ammonia, and phosphates -- substances that can harm plankton and fish. Small oil spills released from motors and refueling activities contain petroleum hydrocarbons that tend to attach to waterborne sediments. These persist in aquatic ecosystems and harm the bottom-dwelling organisms that are at the base of the aquatic food chain.[2]

Often underestimated or ignored by the public, the discharge of sewage and waste from boats, can degrade water quality (especially in marinas with high boat use). Fecal contamination from the improper disposal of human waste during boating can make water unsightly, unsuitable for recreation, and cause severe human health problems. Sewage discharged from boats also stimulates algae growth, which can reduce the available oxygen needed by fish and other organisms. Although fish parts are biodegradable, when many fish are gutted and cleaned in the same area on the same day, a water quality problem can result. Like raw sewage, excess fish waste can stimulate algae growth.[2]

As stated in Chapter 6, it is estimated that there are 8,718 boats registered to owners residing within the Lower Coosa River Basin. Since boats are registered in the owner's county of residence, this does not always reflect where the boat is most often used. This number does not take into account the high number of boats located at seasonal lake residences that are registered in counties other than Autauga, Chilton, Clay, Coosa, Elmore Shelby, or Talladega Counties. Nor does it take into account the number of boats used on the lakes on an occasional basis and are then trailered back to their home county. It is very possible that the number of boats actually in use on a regular basin in the Lower Coosa River Basin is two to three times higher than the conservative estimate of the 8,718 registered boats in the basin.

Last, poorly planned marinas can disrupt natural water circulation and cause shoreline soil erosion and habitat destruction. To reduce activities that cause nonpoint source pollution, marinas should be located and designed so that natural flushing regularly renews marina waters.[2] A inventory of the existing facilities on the three lakes in the basin shows that there were a total of 46 ramps, marinas, or fishing camps in operation as of 1999 with five former facilities being closed. Of the operational facilities, 14 are located on Lake Jordan; 13 are located on Lake Mitchell; and 19 are located on Lay Lake.(WWG) Refer to Figures 113, 114 and 115 for details on facilities that are available at each lake and where they are located.

All of the facilities except five have boat ramps providing access to the lakes and the Coosa River. Just under half of the facilities have fuel available; however, none of the facilities have diesel fuel. Marine repair is offered at four facilities: two on Lake Jordan and one each on Lay Lake and Lake Mitchell. Currently, only one facility, located on Lay Lake, offers a pump out station (the two facilities previously located on Lake Jordan are now inactive) and restrooms are only available at eight of the facilities. There are six facilities that offer overnight docking and another 18 that have overnight facilities available in the way of motels, cabins or campgrounds. Other services and goods provided at some of the facilities include boat rental, boat hoists, bait and fishing supplies, miscellaneous supplies, food and beverages, restaurants and picnic areas.

Figure 113:

Lake Jordan Facilities

Name of Facility or Area	Pump Out Station	Boat Ramp	Fuel: Gas	Fuel: Diesel	Overnight Docking	Boat Rental	Boat Hoist	Marine Repair	Bait/Fishing Supplies	Food and Beverages	Restaurant	Restrooms	Picnic Area	Camping Facilities	Motel/Cabins	Monitor VH
State Ramp		O											O			
Lake Jordan Marina	O	O	O		O		O	O		O		O	O			
State Ramp		O											O			
Bonner's Landing	O															
Holtville Recreation Area		O														
Blackwell's Fishing Lodge		O	O						O	O						
Joe's Fish Camp		O				O	O	O	O				O			
Ramp		O														
Lakeview Marina		O														
Ramp		O														
Ramp		O														
Log Cabin Beach		O							O	O			O	O		
Mama Jean's Fishing Camp		O							O				O	O		
Coosa Fishing Lodge									O	O			O	O		

Source: Geological Survey of Alabama, Alabama Waterways Guide. 1999

Figure 114:

Lake Mitchell Facilities

Name of Facility or Area	Pump Out Station	Boat Ramp	Fuel: Gas	Fuel: Diesel	Overnight Docking	Boat Rental	Boat Hoist	Marine Repair	Bait/Fishing Supplies	Food and Beverages	Restaurant	Restrooms	Picnic Area	Camping Facilities	Motel/Cabins	Monitor VH
State Ramp		O	O		O		O	O		O		O	O	O		
Cargyle Creek Marina		O	O			O										
Inman's Fishing Camp		O	O													
Chilton County Park		O											O	O		
Pokanatchee Lodging		O	O			O			O	O			O		O	
Lavada's Fishing Camp		O	O			O			O	O	O		O	O		
Seab & Sam's Fishing Camp		O	O			O			O	O				O		
Cedar Circle Fishing Camp		O	O							O			O	O		
Lay Field Marina		O	O						O	O						
State Launching Site		O														
Barrette's Fishing Camp		O	O			O			O	O			O	O	O	
Horse Stomp Campground														O		
Public Use Area																

Source: Geological Survey of Alabama, Alabama Waterways Guide. 1999

Figure 115:

Lay Lake Facilities

Name of Facility or Area	Pump Out Station	Boat Ramp	Fuel: Gas	Fuel: Diesel	Overnight Docking	Boat Rental	Boat Hoist	Marine Repair	Bait/Fishing Supplies	Food and Beverages	Restaurant	Restrooms	Picnic Area	Camping Facilities	Motel/Cabins	Monitor VH
Pineview Fish Camp		O	O			O			O	O			O	O		
Little Tom Fish Camp		O	O			O		O	O	O					O	
Layport Camp		O	O			O			O	O					O	
Waxahatchee Marina		O			O				O	O	O	O	O			
Joe White's Camp		O														
Shelby County Park		O											O			
La Coosa Marina		O	O						O	O		O	O	O		
Bozo's Fish Camp		O	O		O				O	O		O		O		
State Ramps		O														
Camp Okoma		O	O		O				O	O	O	O	O			
Cedar Creek Marina		O	O			O			O	O			O	O	O	
Paradise Point Marina	O	O	O						O	O		O	O			
Beeswax Bait and Grocery			O						O	O		O				
Ingram's Fishing Camp		O														
Smith's Camp		O			O								O			
Lakeshore Village		O														
Pop's Landing		O														
Glover's Point Park		O											O	O		
Kelly Spring Ramp		O														

Source: Geological Survey of Alabama, Alabama Waterways Guide. 1999

Mining. Mining is both a point source and a nonpoint source of pollution. And, although only a small area of the land surface is disturbed by mining, the impacts of improperly managed sites on surface water are significant. One of the most vocalized concerns with mining is acid mine drainage (AMD) which is caused when water flows over or through sulfur-bearing materials forming solutions of net acidity. AMD comes mainly from abandoned coal mines and currently active mining. Of the thirteen mining operations in the Lower Coosa River Basin, all are mining operations for construction materials, such as rock, gravel, sand and fill dirt. Therefore, AMD is not the primary concern in this basin; instead, runoff and sedimentation is a much greater concern.

The most common form of physical pollution from mining is sediment. Surface mining creates large areas of disturbed land which are often highly erodible. During contour strip mining operations, the practice of placing overburden on the downslope side of an outcrop can result in excessive siltation in water courses. In the mining of sand and gravel, mines most often use a wet process and reuse their water. Contamination of streams can occur at times of heavy and/or sustained rain and occasional violations of suspended solids standards may be attributed to these facilities. While sand and gravel operations are permitted operations, i.e., point sources, and are supposed to be operating as a fairly closed system with no discharge, these operations are a potential source of nonpoint source pollution and good management practices should be followed in order to keep runoff to a minimum.

As seen in Figure 111, mined land is among the lowest contributors of sediment in the Lower Coosa River Basin at an estimate 259,008 tons per year, with only sediment from gullies being less. Of the 20 watersheds, 11 have mined land that contribute sediment to the basin. Those watersheds that produce the most sediment annually are Waxahatchee Creek, at 90,000 tons, Cedar Creek, at 60,000 tons, and Buxahatchee Creek, at 45,000 tons.

SWCC Priority Watersheds

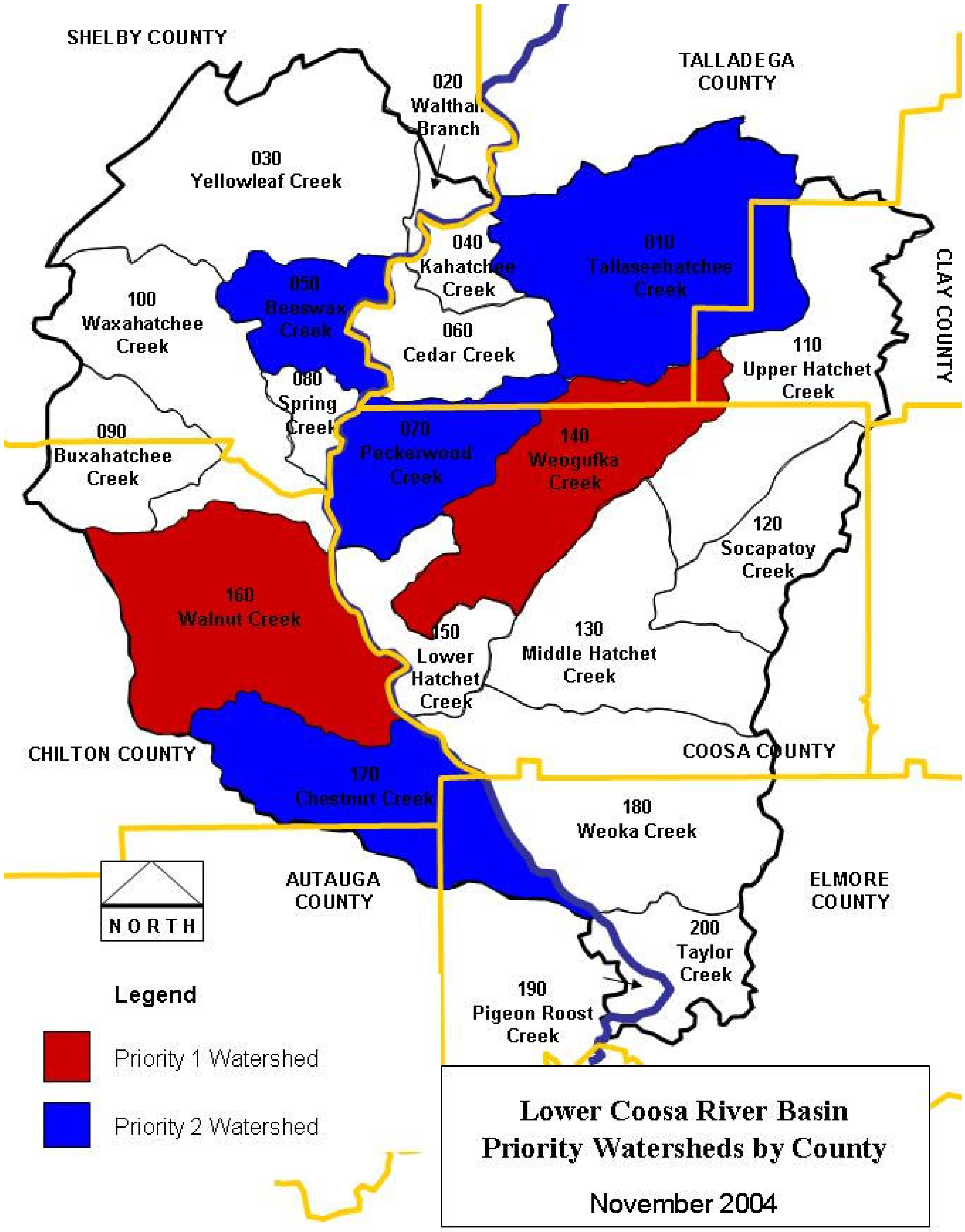
Much of the section in this chapter has been drawn from the basin assessments conducted in 1999 by the county Soil and Water Conservation Districts and compiled and published by the Alabama Soil and Water Conservation Committee. These agencies are part of the state branch of the federal Natural Resource and Conservation Service agency. As a result of the basin assessment process, each county identified priority watersheds in their respective counties. Since the Lower Coosa River Basin does not encompass all of any of the seven counties, not all counties have priority watersheds in the Lower Coosa River Basin. Those watersheds that are ranked as Priority 1 watersheds by counties are Walnut Creek in Chilton County and Weogufka Creek in Coosa County. Priority 2 watersheds are Beeswax Creek in Shelby County, Chestnut Creek in Chilton County, Peckerwood Creek in Coosa County and Tallaseehatchee Creek in Talladega County.

The basin assessments conducted by the Soil and Water Conservation Districts will be updated beginning in the Fall of 2005. Information from the 2005 assessment is expected to be more accurate due to a better understanding of expectations and uses of the final product and the use of technological innovations. In addition, it is expected that the 2005 basin assessments will include information at much smaller watershed levels.

Additionally, each of the watersheds statewide was assigned a rating for each of five sources of nonpoint source pollution: sediment, pesticides, animal wastes, domestic wastewater, and urban runoff. Ratings were based on the potential for pollution from each of five nonpoint sources based on activities on the land. Ratings were from one to five with five equal to the highest potential and one equal to the lowest potential. Figure 117 shows those watersheds that received a rating of “5” for in any one of the five nonpoint source pollution categories.[3]

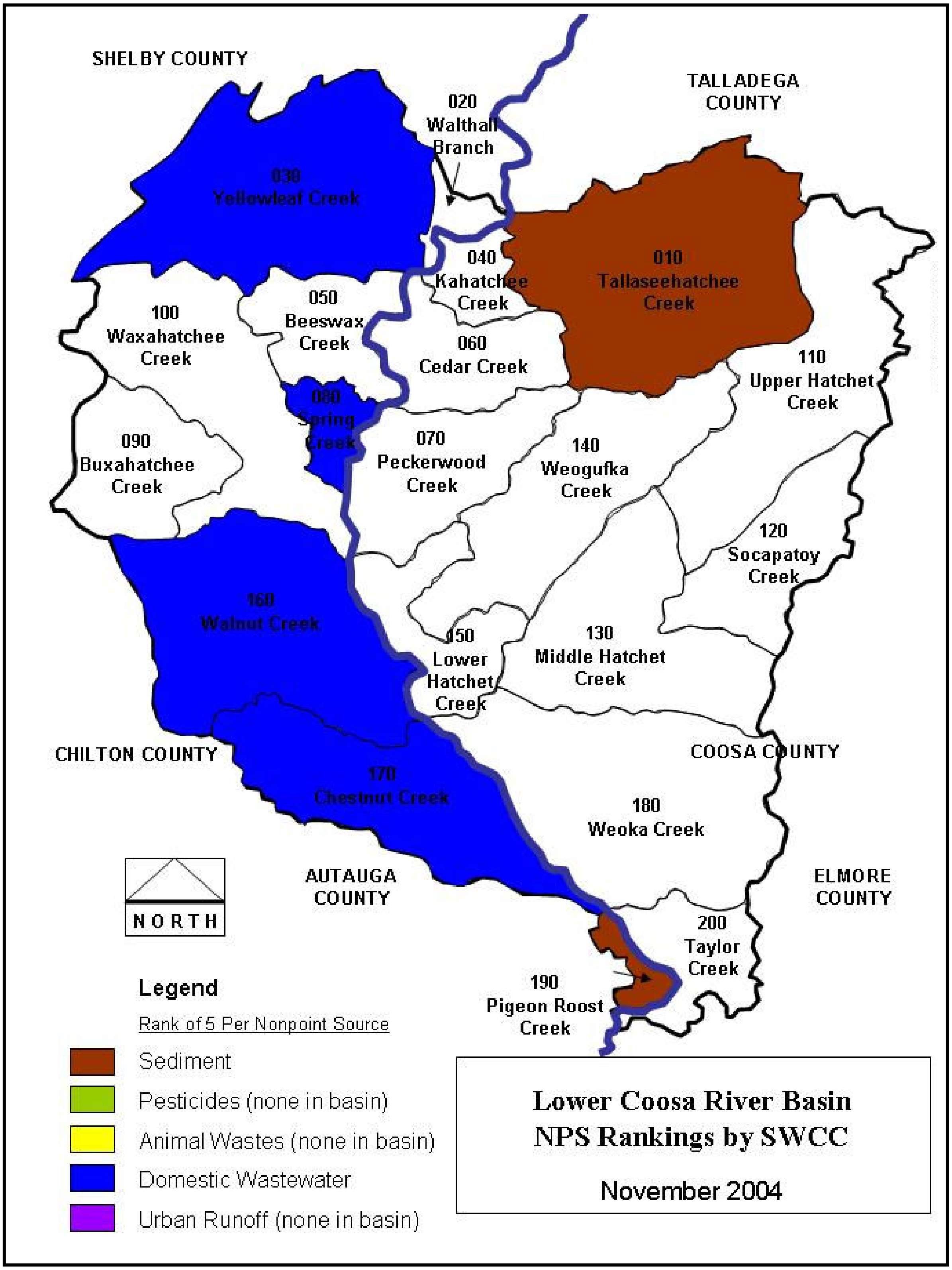
Six of the 20 watersheds received a rating of “5” in one of the nonpoint source pollution categories. For sediment, the watersheds in the basin with a rating of “5” are Tallaseehatchee Creek and Pigeon Roost Creek. Fore domestic wastewater, watersheds with a rating of “5” are Yellowleaf Creek, Spring Creek, Walnut Creek, and Chestnut Creek.[3]

Figure 116:



Source: Alabama Soil and Water Conservation Committee, Basin Assessments, 1999.

Figure 117:



Source: Alabama Soil and Water Conservation Committee, Basin Assessments, 1999.

Lake Eutrophication

Water quality in the streams and creeks in a watershed or basin also have an affect on the water quality in the lakes or reservoirs that are fed by the streams and creeks. The process by which water bodies become more productive through increased input of nutrients, primarily nitrogen and phosphorus, is known as eutrophication. Normally, increased plant (algae and/or macrophyte) productivity and biomass are considered part of the eutrophication process though nutrients can increase without an increase in plant growth if available light in the water column is limited by high concentrations of suspended solids. The classical trophic succession sequence that occurs in natural lakes is as follows:

Oligotrophy: nutrient-poor, biologically unproductive;
Mesotrophy: intermediate nutrient availability and productivity;
Eutrophy: nutrient-rich, highly productive;
Hypereutrophic: the extreme end of the eutrophic stage.[4]

Depending on the nature of the watershed however, eutrophication of natural lakes may take thousands of years or they may never become eutrophic. All of the waterbodies in the Lower Coosa River Basin are reservoirs rather than natural lakes. Trophic succession in reservoirs does not occur in the classical form as in natural lakes. After filling of the reservoir basin, trophic upsurge occurs, resulting in high productivity of algae and fish. The trophic upsurge is fueled by nutrient inputs from the watershed, leaching of nutrients from the flooded soils of the basin, and decomposition of terrestrial vegetation and litter. Eventually a trophic depression takes place with a decline in the productivity of algae and fish as these initially available nutrient sources decline. In time, a less productive but more stable trophic state is established. The trophic state that the reservoir eventually settles into (oligotrophic, mesotrophic, or eutrophic) is determined by the combination of the natural fertility of the watershed and the effects of the point and nonpoint sources of pollution within the watershed.[4]

The concern about eutrophication from a water quality standpoint is more likely due to cultural eutrophication. Cultural eutrophication can be defined as eutrophication brought about by the increase of nutrient, soil, and /or organic matter loads to a lake or reservoir as a result of anthropogenic activities. Activities that contribute to cultural eutrophication include mismanaged wastewater treatment discharges, agricultural and silvicultural activities, residential and urban development, and road building. Increased eutrophication in a waterbody occurring over a period of 10 to 50 years usually indicates cultural eutrophication.[4]

The effects of cultural eutrophication to a reservoir that is highly productive, or eutrophic, can lead to hypereutrophic conditions. Hypereutrophic conditions are characterized by the following:

a) dense algal populations;
b) low dissolved oxygen concentrations;
c) increased likelihood of fish kills; and,
d) interference with public water supply and recreational uses.

Regardless of whether a reservoir is oligotrophic, mesotrophic, or eutrophic, however, cultural eutrophication negatively affects biological communities of these waterbodies through sedimentation and changes in water quality variables such as dissolved oxygen, pH, water temperature, and light availability.

<u>Source Documents:</u>

1. Alabama Department of Environmental Management. Office of Education and Outreach. *NEMO Factsheet 2: Nonpoint Source Water Pollution*. Reprinted with permission of The University of Connecticut Cooperative Extension System. 1999. http://www.adem.state.al.us/Education%20Div/Nonpoint%20Program/WSNPSResMat.htm

2. Environmental Protection Agency. Office of Wetlands, Oceans and Watersheds. *Nonpoint Source Pointers* (Factsheets). 1996. http://www.epa.gov/OWOW/NPS/facts/

3. Alabama Soil and Water Conservation Committee, Alabama Watershed Assessment, 1999. Watershed Statistics. http://www.swcc.state.al.us

4. Environmental Indicators Section, Field Operations Division of the Alabama Department of Environmental Management. *Intensive Water Quality Survey of Coosa and Tallapoosa River Reservoirs: 1997*. March 24, 1999.

Chapter 10
Water Quality Monitoring

As discussed in Part II of this plan, streams must maintain water quality equal to the requirements of their use classification. The State of Alabama in the regulations enforced by the Alabama Department of Environmental Management monitors water quality based on eight criteria: (1) pH; (2) temperature; (3) dissolved oxygen; (4) toxic substances; (5) taste, odor and color-producing substances; (6) bacteria; (7) radioactivity; and (8) turbidity. These were explained in detail in Chapter 6 and therefore, will not be explained in this chapter. These criteria were established, primarily, to ensure that point source dischargers are meeting their permit requirements (limits) and to ensure that water bodies are not overburdened with point source discharges to a degree that they can no longer sustain their use classification. These classification systems enable the State to determine how water should be used, how much it can be used, and to the extent possible, minimize conflicting uses of the state's waters.

Nonpoint source pollution, however, is a non-regulated activity. If the point source dischargers are upholding their permit requirements and monitoring shows that there are still water quality problems in a stream, then the pollution must be coming from nonpoint sources – that is, the people who live and work in a watershed and use it everyday. It is important for these reasons, that ongoing monitoring of creeks, streams and rivers be in place to further ensure the health of our rivers and the protection of species that balance the natural ecosystem. Full water quality monitoring is generally more in-depth than the chemical monitoring conducted for point source discharge requirements. In addition to chemical monitoring, full monitoring of the stream health includes habitat assessment and biological assessment.

In this chapter, types and sources of nonpoint source pollution and existing monitoring programs for the Lower Coosa River Basin and/or the full Coosa River Basin will be reviewed. These include sampling conducted by the US Geological Survey for the development of this plan, the Alabama Department of Environmental Management (ADEM) monitoring programs and volunteer monitoring. As a part of the Lower Coosa River Basin Management Plan process, sampling was conducted at 12 sites in the basin by the Alabama Office of Water Resource of the U.S. Geological Survey (USGS) in August 2003. The

Administrative Report produced by the USGS for this project is included as Appendix B. The USGS sampling portion of the project was conducted through a cooperative agreement between the USGS, Alabama Office of Water Resources and the Central Alabama Regional Planning and Development Commission.

The Field Operations Division of ADEM conducts seven water quality monitoring programs on a rotational basis to cover all river basins. The programs are the Alabama Monitoring and Assessment Program (ALAMAP), the Coastal Watershed Survey Program, the Nonpoint Source Assessment Program, the Point Source Assessment Program, the Compliance Monitoring Program, the Reservoir Water Quality Monitoring Program, and the Fish Tissue Monitoring Program. The monitoring programs that are applicable to this plan are the Nonpoint Source Assessment Program, which is on a five-year rotation schedule and the Reservoir Water Quality Monitoring Program.

With the exception of reservoirs in the Tennessee River system which are assessed by the TVA, the Reservoir Water Quality Monitoring Program assesses the water quality and trophic status of all publicly accessible lakes and reservoirs in the State. Monitoring takes place during the algal growing season at least once every two years with many lakes/reservoirs being monitored every year. This routine reservoir monitoring is supplemented with information gained from more intensive studies conducted on selected reservoirs as funding becomes available. The Reservoir Water Quality Monitoring Program studies typically include vertical profiles of select physical/chemical parameters, chemical and bacteriological sample collection, chlorophyll *a* and phytoplankton analysis. Objectives of the program are: a) to develop an adequate water quality database for all publicly owned lakes in the state; b) to establish trends in lake trophic status that are only established through long-term monitoring efforts; and, c) to satisfy Section 314 (a)1 of the Water Quality Act of 1987.[1]

Nonpoint Source Assessments are conducted at the request of the Nonpoint Source Unit of the ADEM Office of Education and Outreach as part of selected watershed projects. Intensive surveys conducted at nonpoint source priority stations are resource intensive. They are necessary, however, to assess subtle differences in water quality, to detect trends in water quality and to identify sources of impairment. Because these methods are resource intensive, an assessment tool is needed to identify sub-watersheds most impacted by point and nonpoint sources of pollution. The Department's regulating programs and the Nonpoint Source Unit can then use resources more effectively by targeting these basins for implementation of water pollution controls, total maximum daily load studies and intensive surveys. The objectives of the basin wide screening assessments developed by the ADEM Field Operations Division are to rank and prioritize subwatersheds most in need of remedial action and to identify major pollution sources present in each sub-basin. Intensive nonpoint source watershed assessments generally consist of physical/chemical and bacteriological sample collection and analysis, instream community assessments (macroinvertebrate/fish/periphyton) and assessments of habitat quality. Assessments are conducted before and after implementation of Best Management Practices (BMPs) to evaluate trends in water quality and physical habitat due to BMP implementation. This assessment method relies upon baseline data collected at reference stations to accurately assess trends in water quality. Information generated during the basin screening and watershed assessments can be used to assess percent impaired waters within each major basin and will increase the miles monitored within each basin.[1]

Alabama Water Watch (AWW) is a statewide program dedicated to developing citizen volunteer monitoring of Alabama's surface waters. It is funded in part by the US EPA Region 4 Clean Water Act §319 and ADEM and is coordinated through the Department of Fisheries and Allied Aquacultures of Auburn University. AWW provides free workshops to educate citizens on how to monitor and evaluate the physical, chemical and biological features of water. After attending the workshops, citizens become certified monitors. All monitoring techniques and other quality assurance protocols are approved by the Environmental Protection Agency. The certified monitors submit their data to AWW online or by mail and then summary graphs and maps are accessible to everyone through the AWW website. (The data is also shared with the Water Quality Branch of the ADEM)

USGS Sampling

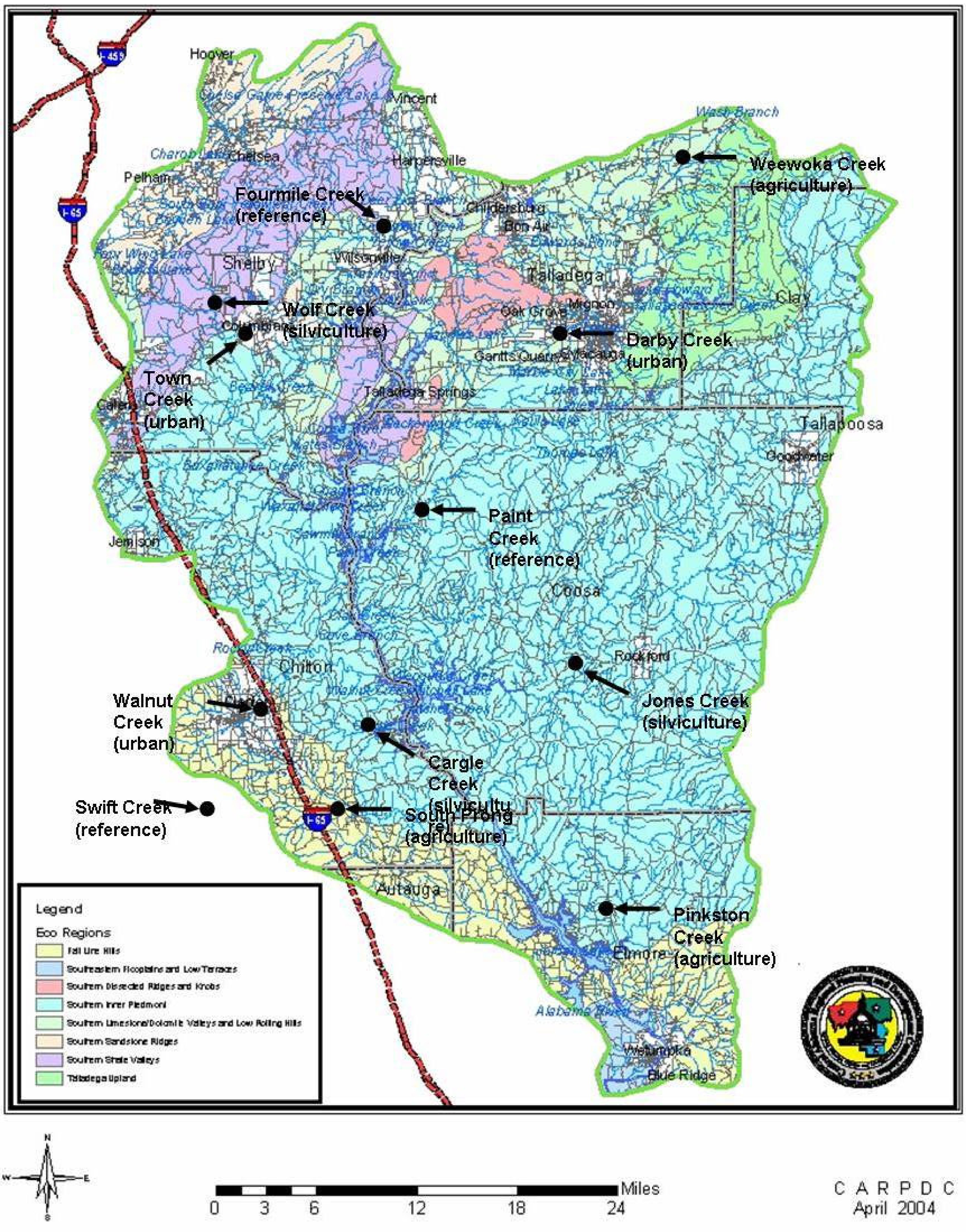
The objectives of the USGS portion of the work on the Lower Coosa River Basin Management Plan were to search USGS databases for existing water quality and biological data in the basin and collect additional data at selected sites representing the various land uses in the basin. Nine sampling sites were selected representing urban, silviculture and agricultural land use areas as well as the various ecoregions within the basin. Three additional sites were selected as background sites as a comparison of sites with relatively little development. Geographically, the sites were located throughout the basin. See Figure 118. The water quality samples were analyzed for major ions, nutrients and pesticides. Field measurements of stream discharge, temperature, specific conductance, dissolved oxygen and pH were made at the time each sample was collected. Biological assessments were conducted by collecting benthic macroinvertebrates at each site along with a habitat assessment.

The work completed during the USGS study provides a snapshot in time of the water quality and biological conditions in several streams in the Lower Coosa River Basin. The most important aspect of the study is not so much that it might identify areas that are being impacted by various land uses but that it has established a baseline of data in the basin that future surveys will be able to look to as a reference point with which to compare to see if land use management practices, for better or worse, are having an impact on the well being of the streams in the Lower Coosa River Basin.

Water quality and benthic macroinvertebrate samples were collected in 2003 during baseflow conditions at the 12 sites in order to minimize the effects of overland storm runoff. A rapid bioassessment protocol used by the Alabama Department of Environmental Management (ADEM) was used to collect the samples. The macroinvertebrate samples were analyzed by a USGS contract lab. The water quality samples were analyzed by the USGS National Water Quality Laboratory in Denver, Colorado.[2]

Figure 118:

Lower Coosa River Basin Management Plan
USGS Sampling Sites
August 2003



Source: _Effects of Land Use on Water Quality and Biology of Streams in the Lower Coosa River Basin in Alabama_. *Will S. Mooty. USGS, Alabama Office of Water Resources, with base map provided by the Central Alabama Regional Planning and Development Commission. May 2004*

Figure 119:

Summary of Water Quality Parameters in Selected Sites in the Lower Coosa River Basin

	Water Quality Parameter	Standards	Swift Cr.	Fourmile Cr.	Paint Cr.	Walnut Cr.	Town Cr.	Darby Br.	Cargle Cr.	Wolf Cr.	Jones Cr.	Pinkston Cr.	South Prong	Weewoka Cr.
	Land use		Reference	Reference	Reference	Urban	Urban	Urban	Silviculture	Silviculture	Silviculture	Agriculture	Agriculture	Agriculture
	Date sampled		8/18/2003	8/12/2003	8/11/2003	8/19/2003	8/12/2003	8/11/2003	8/18/2003	8/12/2003	8/13/2003	8/13/2003	8/18/2003	8/11/2003
	Discharge (cubic ft/sec)		32.1	3.83	23.7	13.6	0.706	0.81	9.42	0.515	11.5	2.23		26
	Drainage area (mi2)		24.7	13.4	16.7	28.6	2.86	2	10.4	13.3	5.66	3.09	14.1	23.3
	Dissolved oxygen (mg/L)	>5.0 (1)	7.9	6.9	8.6	7.9	11.5	6.8	8.7	7.5	8.8	7.9	7.2	8.5
	pH	6.5-9.0 (1)	6.4	7.7	6.9	6.7	8	7	6.6	6.4	6.8	6.7	6.2	7.5
	Specific conductance (µS/cm)		33	279	37	80	315	272	31	46	35	55	33	215
	Water temperature (Celsius)		24.3	23	22.8	27.8	21.7	22.7	23.3	23.5	22.2	22.5	25	20.2
	Hardness		10	150	12	28	160	120	8	17	11	14	11	120
	Calcium (mg/L)		2	50.3	2.82	7.78	55	31.3	1.54	3.54	2.53	3.53	2.54	24.2
	Magnesium (mg/L)		1.32	5.81	1.17	2.09	6.27	10.8	0.976	1.97	1.18	1.36	1.18	13.4
	Potassium (mg/L)		1.01	1.01	0.61	1.43	0.96	3.28	1.14	1.02	1	1.5	0.93	0.98
	Sodium (mg/L)	20 (3)	1.56	1.96	2.38	2.5	4.63	4.43	1.92	1.99	1.84	3.86	1.75	1.95
	Alkalinity (mg/L as CaCO3)		8	137	15	25	146	73	8	16	12	18	10	97
	Chloride (mg/L)	250 (3)	3.18	3.42	1.58	5.4	4.17	7.9	2.59	1.61	4.26	4.35	3.01	3.41
	Fluoride (mg/L)	2 (3)	0.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	0.2	<.2
	Silica (mg/L)		7.69	8.13	14.1	8.22	12.1	12.4	8.19	8.5	14.3	16.1	6.87	9.75
	Sulfate (mg/L)	250 (3)	1.2	4.3	1.5	3.5	9.8	10.7	2.1	3.6	0.7	0.7	0.9	3.5
	Total dissolved solids (mg/L)	500 (3)	33	169	22	65	178	159	28	45	33	62	40	115
Nutrients	Ammonia+org-N, filtered as N		0.15	0.2	0.09	0.3	0.07	1.2	0.07	0.22	<.1	0.14	0.26	0.07
	Ammonia+org-N, unfiltered as N		0.23	0.19	0.12	0.41	0.1	1.2	0.09	0.31	0.06	0.19	0.37	0.09
	Ammonia (mg/L)					0.1		1.01						<.04
	Ammonia as N (mg/L)	2-7 (1,4)	<.04	<.04	<.04	0.08	<.04	0.78	<.04	<.04	<.04	<.04	0.03	
	Nitrate (mg/L)							31.5						
	Nitrate as N (mg/L)	10.0 (2)						7.11						
	Nitrite+nitrate as N (mg/L)	10.0 (2)	0.34	0.22	<.06	0.43	0.52	7.3	0.14	0.07	<.06	0.37	0.09	1.39
	Nitrite (mg/L)							0.624						
	Nitrite as N (mg/L)	1.0 (2)	<.008	<.008	<.008	<.008	<.008	0.19	<.008	<.008	<.008	<.008	<.008	<.008
	Organic nitrogen, filtered (mg/L)					0.22		0.37						
	Org. nitrogen, unfiltered (mg/L)					0.33		0.46						
	Orthophosphate (mg/L)							0.138						
	Orthophosphate as P (mg/L)		<.02	<.02	<.02	<.09	<.02	0.04	<.02	<.02	<.18	<.18	<.02	<.02
	Phosphorus, filtered (mg/L)		0.003	0.011	0.005	0.004	0.007	0.069	0.004	0.007	<.004	0.007	0.005	0.01
	Phosphorus, unfiltered (mg/L)	0.1 (5)	0.016	0.021	0.017	0.02	0.013	0.08	0.013	0.033	0.005	0.027	0.026	0.012
	Total nitrogen, filtered (mg/L)		0.49	0.41		0.73		8.5		0.29		0.51	0.34	
	Total nitrogen, unfiltered (mg/L)		0.57	0.41		0.84	0.62	8.5		0.39		0.56	0.45	
	Iron (µg/L)	300 (3)	65	12	114	187	7	13	52	251	25	127	235	4
	Manganese (µg/L)	50 (3)	59.5	27.3	22.6	222	27.6	49.6	11.8	84.9	12.8	57.2	154	29.8
Pesticides	CIAT (µg/L)							0.013						0.056
	Atrazine (µg/L)	3 (2)					0.007	0.166						0.061
	Disulfoton (µg/L)	3 (2)						0.06						
	Prometon (µg/L)					detected	0.01	0.03						
	Tebuthiuron (µg/L)					0.02		0.07						
	Dieldrin (µg/L)						0.008							
	Simazine (µg/L)	4 (2)					0.012							
	Carbaryl (µg/L)	2 (2)				0.017								

(1) Levels outside of which aquatic life is affected, (2) EPA drinking water standards, (3) Secondary water quality standards; taste, odor and color affected, (4) Parameter is pH and temperature dependent, (5) Levels above this concentration contribute to excessive algal growth.

Source: *Effects of Land Use on Water Quality and Biology of Streams in the Lower Coosa River Basin in Alabama.* Will S. Mooty. USGS, Alabama Office of Water Resources. May 2004

Water Quality Assessments. At the time of sampling in August 2003, levels of nutrients in the study area were generally low with the exception of Darby Creek in Sylacauga, Alabama. Levels of nitrate nitrogen there were measured at 7.1 mg/L which was still below the US Environmental Protection Agency standard of 10.0 mg/L. Phosphorus measured 0.08 mg/L, just below the US Environmental Protection Agency standard of 0.1 mg/L.[2]

Eight pesticides were detected among four of the sites in the Lower Coosa River Basin. All three urban sites had detects of various pesticides and one agricultural site had detections. Of the pesticides detected, prometon, tebuthiuron, atrazine, CIAT, and simazine are herbicides. Carbaryl, dieldrin and disulfoton are insecticides. Levels of all of the pesticides detected were below US Environmental Protection Agency health standards.[2]

Secondary drinking water quality standards are generally not related to health risks but abnormally high levels of these parameters will adversely affect the taste, color and odor of the water and may cause discoloration of toilets, sinks, bathtubs and other fixtures. Of the parameters tested for secondary drinking water quality standards, only manganese occurred at levels above the standard of 50 mg/L at four of the sites as well as at one of the reference sites. Manganese is a common naturally occurring element. High levels of manganese can alter the color of laundry and fixtures and can cause a bitter taste in water and drinks mixed with the water.[2]

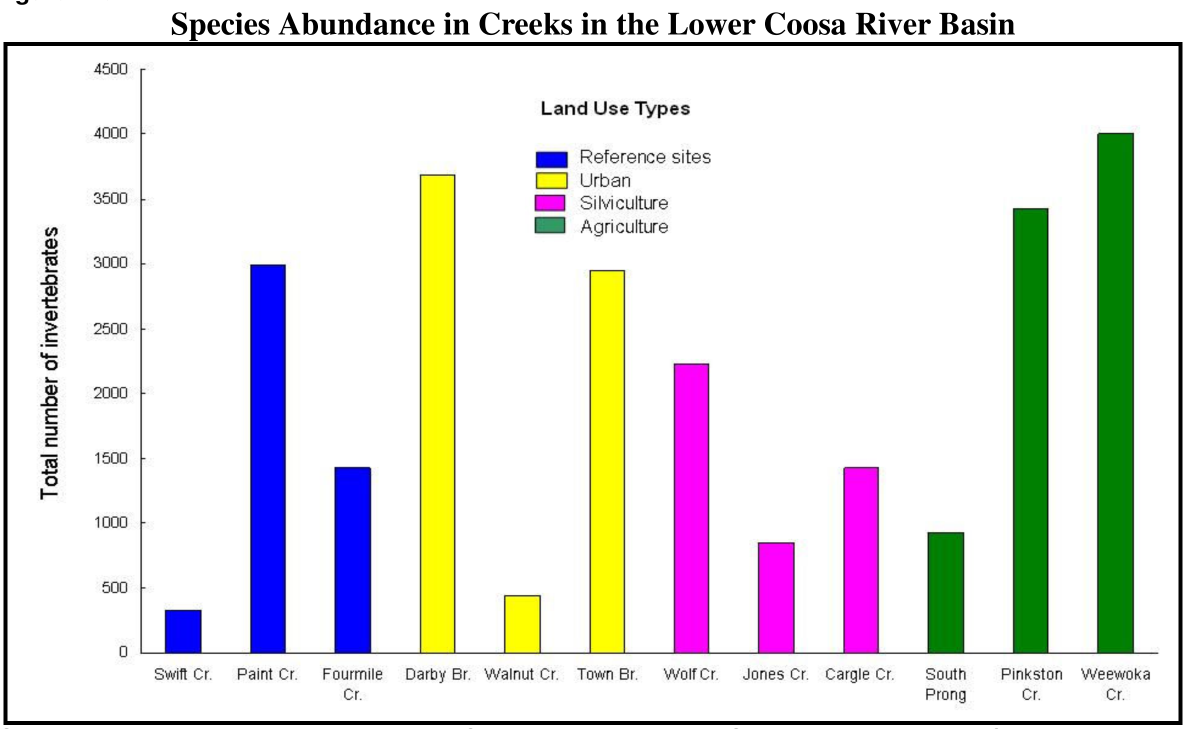
Major constituents are those commonly present in concentrations exceeding 1.0 mg/L. The dissolved cations that constitute a major part of the dissolved-solids content generally are calcium, magnesium, sodium and potassium; the major anions are sulfate, chloride, fluoride, nitrate, and those contributing to alkalinity, mostly carbonate and bicarbonate.[2]

Biological Assessments. Benthic macroinvertebrates are good indicators of local conditions in streams. Many species are sensitive to short-term environmental variations, thus, the diversity and types of species in a stream can indicate whether or not there are abnormal environmental stresses in a stream. Presence of a larger percentage of EPTs (ephemeroptera, plecoptera and tricoptera) species is generally considered to be an indicator of less stress or impacts on a stream. These invertebrates are commonly called mayflies, stoneflies and caddisflies. More tolerant species include midges, black flies and worms.[2]

Figure 120 shows the number of invertebrates collected at each sight as well as the breakdown per land use type. This does not give much of an indication of land use impacts due to variability of stream geology and geometry. A sandy bottomed stream will have less diverse habitat available for invertebrates than one with many rocks and logs in it. However, if the makeup of the various types of invertebrates at each site is analyzed then some patterns may begin to develop. Figure 121 shows the percentage of EPTs at each site.[2]

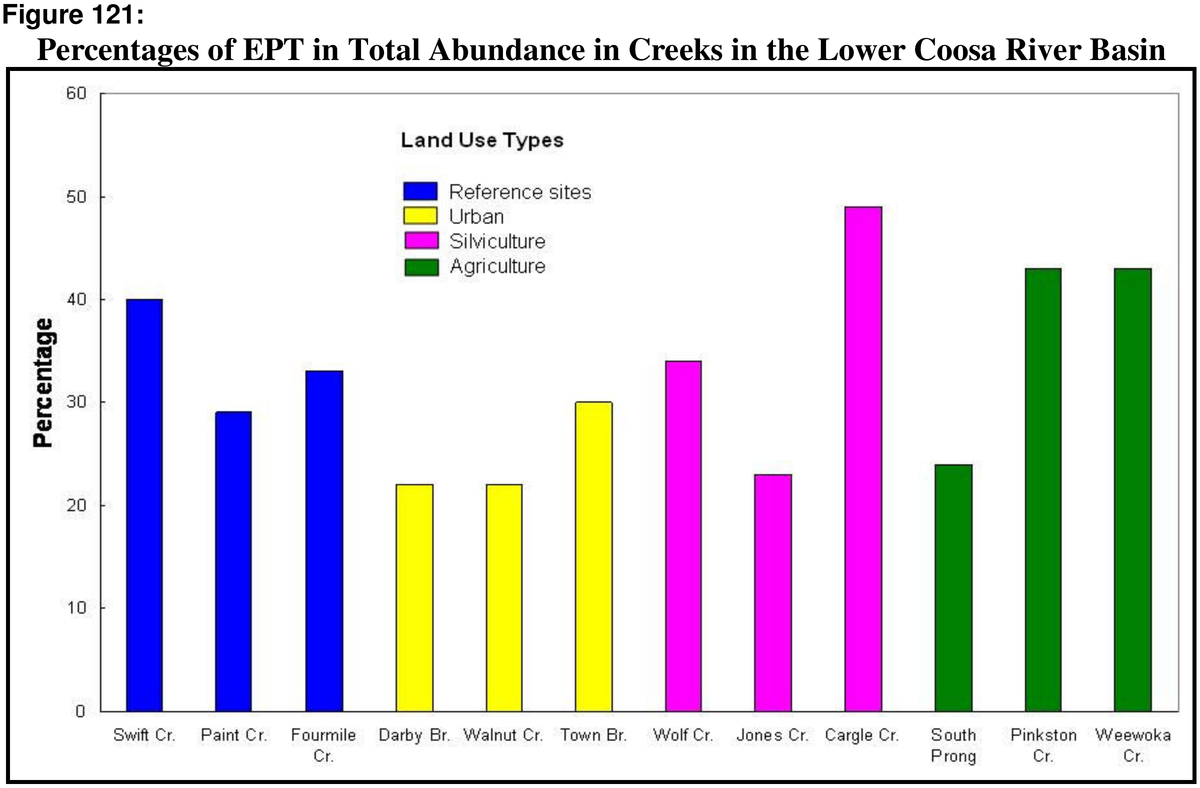
Looking even further into the species distribution at each site in Figure 122, stoneflies were found at all three reference sites, none of the urban sites, two of the silviculture sites, and one of the agriculture sites. Stoneflies are generally one of the most sensitive families of invertebrates and are often one of the first to be impacted by stresses on a stream. Mayflies are also a fairly sensitive. Midges, a very tolerant family of invertebrates, will generally increase in numbers as some of the more sensitive invertebrates begin to disappear due to stresses to the stream.[2]

Figure 120:



Source: *Effects of Land Use on Water Quality and Biology of Streams in the Lower Coosa River Basin in Alabama. Will S. Mooty. USGS, Alabama Office of Water Resources. May 2004*

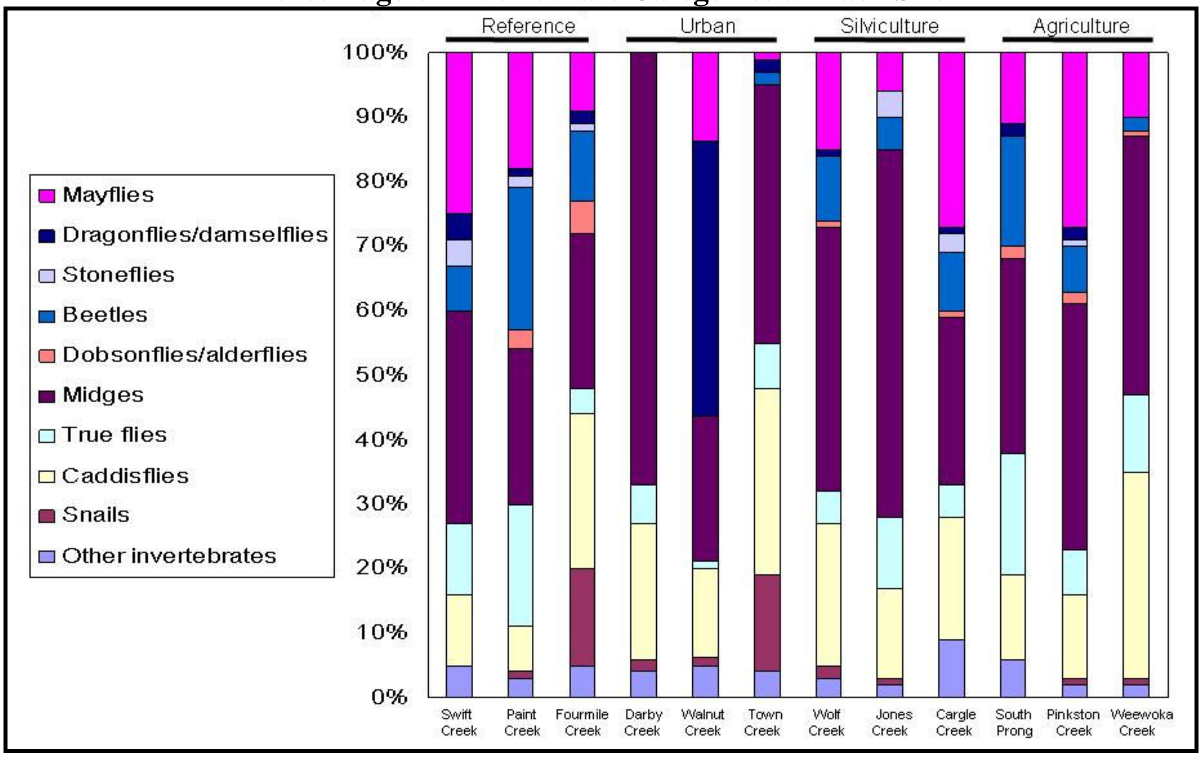
Figure 121:



Source: *Effects of Land Use on Water Quality and Biology of Streams in the Lower Coosa River Basin in Alabama. Will S. Mooty. USGS, Alabama Office of Water Resources. May 2004*

Figure 122:

Percentage of Invertebrate Categories at Each Site



Source: Effects of Land Use on Water Quality and Biology of Streams in the Lower Coosa River Basin in Alabama. Will S. Mooty. USGS, Alabama Office of Water Resources. May 2004.

ADEM Reservoir Water Quality Monitoring Program

Under ADEM's Reservoir Water Quality Monitoring Program, the Coosa and Tallapoosa reservoirs were scheduled for monitoring in 2000. However, water diversion activities were being proposed in both the Coosa and Tallapoosa basins in Georgia that would begin prior to the scheduled monitoring date in 2000. Since water diversion would reduce flows within both basins and could, depending upon the allocation plan selected, result in negative impacts to downstream water quality, the scheduled monitoring of these reservoirs was moved up to 1997.[3]

During 1997, six reservoirs on the Coosa River and four reservoirs on the Tallapoosa River were surveyed, of which three are located in the Lower Coosa River Basin: Lay Lake, Lake Mitchell and Lake Jordan. Intensive monitoring of reservoirs consisted of monthly sampling of all stations from April through October in the Coosa basin. Reservoirs within each basin were sampled within a one-week period to reduce weather-related variability in water quality conditions. Monitoring and analyses were conducted in accordance with appropriate standard operating procedures. Three stations were sampled on Lay Lake and two stations each were sampled on Lake Mitchell and Lake Jordan. Water quality variables that were measured at each site included physical, chemical and biological variables. Physical variables were vertical illumination, temperature, turbidity, total dissolved solids, total suspended solids, specific conductance, hardness, and alkalinity. Chemical variables included dissolved oxygen, pH, ammonia, nitrate + nitrite, total Kjeldahl nitrogen, soluble reactive phosphorus, total phosphorus and total organic carbon. Biological variables included were chlorophyll and fecal coliform.[3]

Corrected chlorophyll *a* concentrations were used in calculating Carlson's trophic state index (TSI) for lakes. Carlson's trophic state index provides limnologists and the public with a single number that serves as an indicator of a lake's trophic status. Corrected chlorophyll *a* is the parameter used in the Reservoir Water Quality Monitoring Program to calculate the trophic state index because it is considered to give the best estimate of the biotic response of lakes to nutrient enrichment when algae is the dominant plant community. The trophic state classification scale used is as follows:

Oligotrophic:	TSI < 40
Mesotrophic:	TSI 40 - 49
Eutrophic:	TSI 50 - 69
Hypereutrophic:	TSI > 70

The algal growth potential test (AGPT) determines the total quantity of algal biomass supportable by the test waters and provides a reliable estimate of the bioavailable and limiting nutrients. In control samples, maximum algal standing crop (MSC) dry weights below 5.0 mg/l (milligrams per liter) are thought to assure protection from nuisance algal blooms and fish-kills in southeastern lakes, with the exception of lakes in Florida. In most freshwater lakes, phosphorus is the essential plant nutrient that limits growth and productivity of plankton algae. Nitrogen usually becomes the limiting nutrient when bioavailable phosphorus increases relative to nitrogen, as in the case of waters receiving quantities of treated municipal waste. The AGPT is helpful in identifying these common growth limiting nutrients.[3]

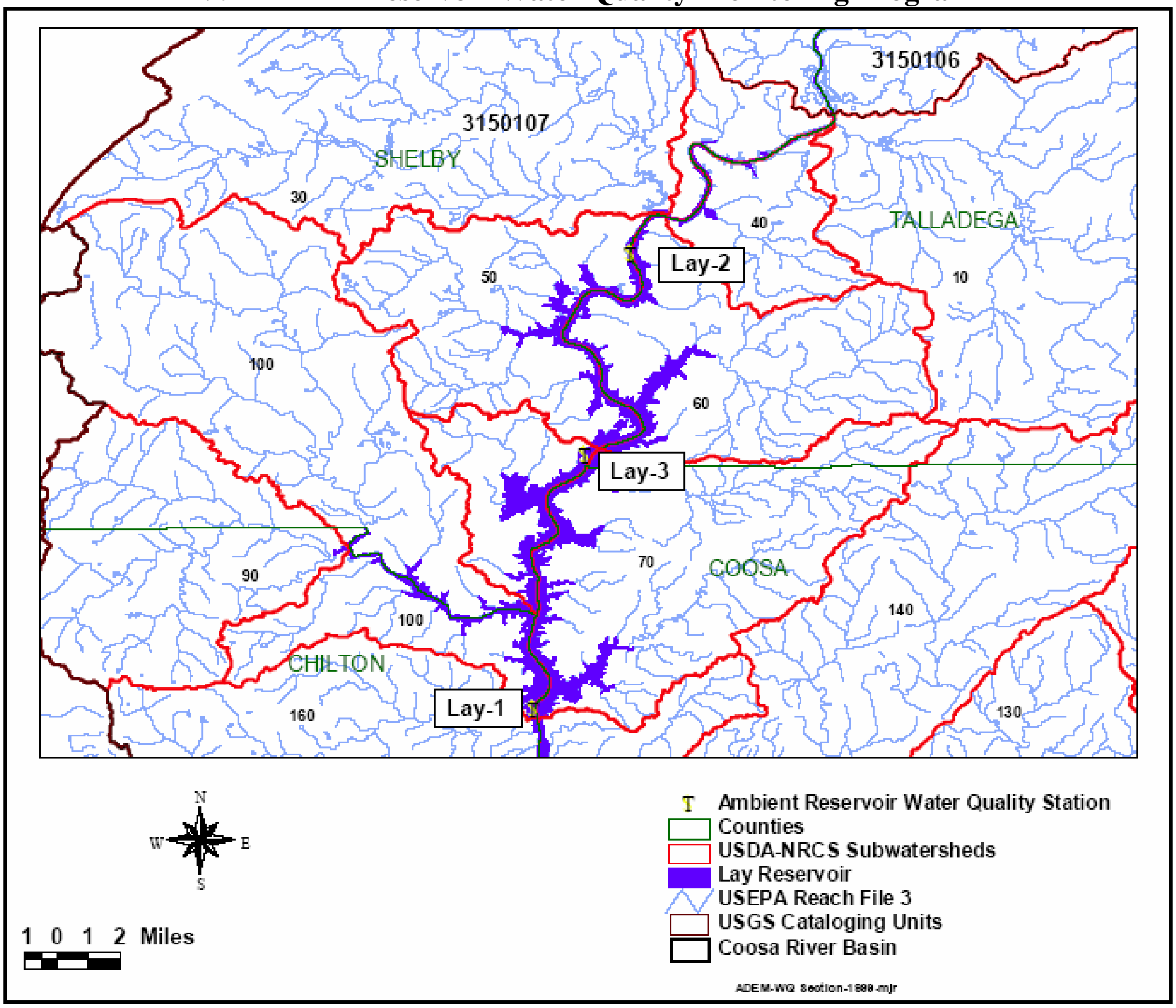
Interpretation of other data utilized to determine the status of the reservoir water quality includes total nitrogen (TN) and total phosphorus (TP), which are used as indicators of nutrient content in the waterbody and dissolved oxygen (DO) concentrations, which is a more direct indicator of water quality because severe depletion can damage aquatic vertebrate and macroinvertebrate communities and interfere with water supply and recreational uses.[3] The following is a discussion of the monitoring results for each of the three reservoirs located in the Lower Coosa River Basin.

Lay Lake. Three sites were sampled in the Lay Lake reservoir as shown in Figure 123. Station 1, in Coosa County, was the deepest point in the main river channel at the dam forebay; Station 2, in Talladega County, was the deepest point in the main river channel upstream of Bullock's Islands; and, Station 3, in Shelby County, was mid-channel immediately downstream of the confluence of Peckerwood Creek and the Coosa River.[3]

The summary of water quality conditions in Lay Lake presented concentrations of nutrients as the primary concern. The mean total nitrogen at mid-reservoir was the highest of all the Coosa reservoir locations. The mean total nitrogen concentrations of the upper and lower reservoirs were similar to those of upstream Logan Martin Reservoir and above those of downstream Mitchell and Jordan Reservoirs. Mean total phosphorus concentrations in the Lay Reservoir were higher than those of upstream Logan Martin, but lower than those of downstream Lake Mitchell. Within the reservoir, the highest total phosphorus occurred at the upper reservoir. Mean maximum algal standing crop values from the AGPT for the upper and lower reservoir were well above the 5.0 mg/l level suggested to assure protection from nuisance algal blooms and fish kills.[3]

Figure 123:

Sampling Stations on Lay Lake
1997 ADEM Reservoir Water Quality Monitoring Program

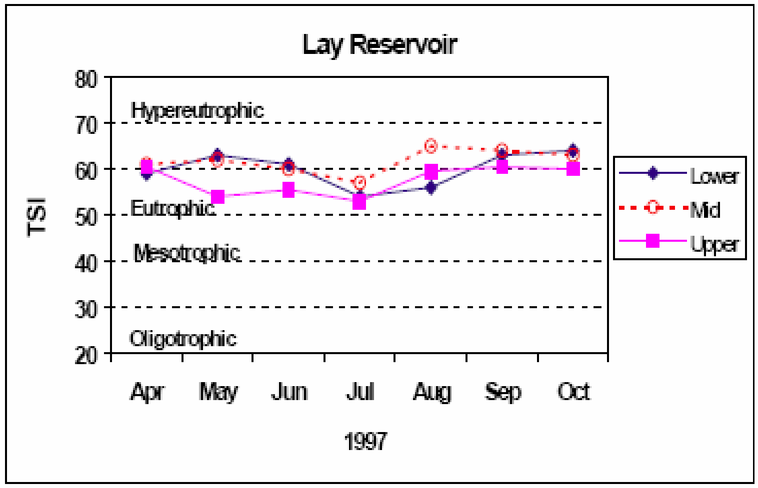


Source: Alabama Department of Environmental Management. Intensive Water Quality Survey of Coosa and Tallapoosa River Reservoirs, 1997. March 24, 1999.

Mean chlorophyll *a* concentrations were lower than those of upstream Logan Martin Reservoir. Trophic state index values derived from these concentrations were generally lower than those of upstream reservoirs and within the eutrophic range. The trophic state index values did not approach hypereutrophic levels in the months sampled. In the lower reservoir, dissolved oxygen concentrations were below the criterion limit in July and August. TSI values in the upper reservoir were generally within the lower half of the eutrophic range April through July, then increased to mid-eutrophic levels August-September. Values at mid reservoir were within the upper levels of the eutrophic range in all months except July. In the lower reservoir, TSI values varied between the upper and lower levels of the eutrophic range.[3]

Figure 124:

Lay Lake Trophic State Index, 1997



Source: Alabama Department of Environmental Management. Intensive Water Quality Survey of Coosa and Tallapoosa River Reservoirs, 1997. March 24, 1999.

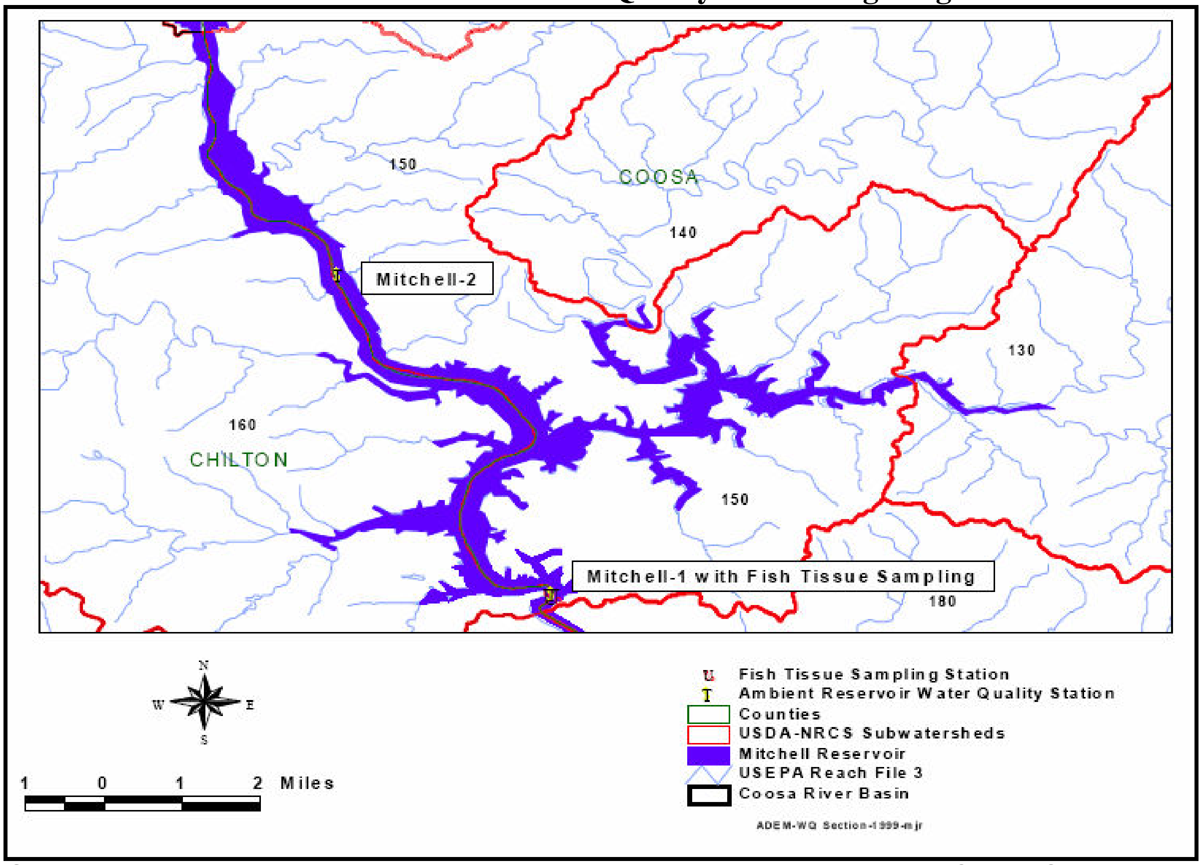
Dissolved oxygen concentrations decreased at all locations in April through July then were generally higher through October. Concentrations at the upper reservoir in June and July (5.75 and 5.50 mg/l respectively) were just above the criterion limit of 5.0 mg/l. Dissolved oxygen concentrations at mid reservoir were well above the criterion limit in all months except July when the value (5.11 mg/l) was just above the criterion limit. In the lower reservoir, DO concentrations in July and August (4.47 and 4.46, respectively) were below the criterion limit. Depth profiles of dissolved oxygen and temperature in the dam forebay of Lay Reservoir indicated weak thermal and chemical stratification during April and May. From June through October, the water column was essentially isothermal. Essentially isochemical conditions occurred in June, August, and October with some chemical stratification occurring in July and September. Highest water column temperatures occurred in July and August with lowest dissolved oxygen concentrations occurring from July through September. With the exception of a small portion of the water column in July, anoxic conditions did not occur in the dam forebay when sampled.[3]

Lake Mitchell. Two sites were sampled in the Mitchell reservoir as shown in Figure 125. Station 1, in Coosa County, was the deepest point in the main river channel at the dam forebay; Station 2, also in Coosa County, was the deepest point in the main river channel downstream of Foshee Islands.[3]

The 1997 study showed nutrients to also be a concern in the Lake Mitchell. Although the total nitrogen concentrations were lower than in upstream reservoirs, the phosphorus concentrations were higher. Mean total nitrogen concentrations for the Mitchell Reservoir were the second lowest of the Coosa reservoirs, at 0.29 mg/l at Station 1 (lower) and 0.30 mg/l at Station 2 (upper). While the monthly total nitrogen concentrations were similar at both locations in all months sampled, the total nitrogen concentrations varied month to month with highest values occurring in August and lowest values occurring in September.[3]

Figure 125:

Sampling Stations on Lake Mitchell
1997 ADEM Reservoir Water Quality Monitoring Program



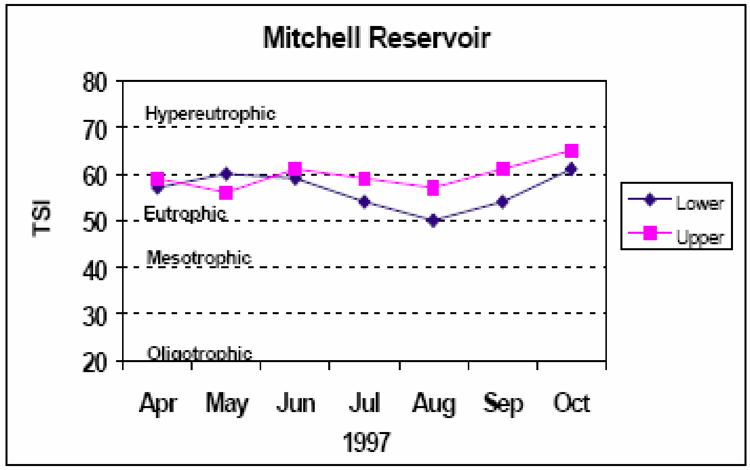
Source: Alabama Department of Environmental Management. Intensive Water Quality Survey of Coosa and Tallapoosa River Reservoirs, 1997. March 24, 1999.

Mean total phosphorus concentrations in Mitchell were second highest to Weiss Reservoir of all Coosa reservoir locations, at 0.09 mg/l in the upper reservoir and 0.08 in the lower reservoir. Monthly total phosphorus concentrations at both reservoir locations decreased from April through June, then increased to their highest point in August. Concentrations decreased in September and increased in October.[3]

Higher phosphorus concentrations were further verified by the AGPT, which indicated nitrogen as the limiting or co-limiting nutrient. Maximum standing crop values, at 6.05 mg/l in the upper reservoir and 7.17 mg/l in the lower reservoir, were greater than the maximum 5.0 mg/l level suggested to assure protection from nuisance algal blooms and fish-kills in southeastern lakes. Mean chlorophyll *a* concentrations for Mitchell were second lowest to Jordan Reservoir of all Coosa reservoir locations. Within the reservoir, mean concentrations in the upper location, at 20.6 mg/l, were substantially higher than those of the lower reservoir, at 15.0 mg/l. Monthly chlorophyll *a* concentrations at both reservoir locations were highest in October. Concentrations in the upper reservoir were lowest in May with those of the lower reservoir lowest in August. Concentrations at both reservoir locations varied monthly with both locations following the same pattern from June through October.[3]

Figure 126:

Lake Mitchell Trophic State Index, 1997



Source: Alabama Department of Environmental Management. Intensive Water Quality Survey of Coosa and Tallapoosa River Reservoirs, 1997. March 24, 1999.

The trophic state index values for both locations in Mitchell Reservoir were generally within the lower half of the eutrophic range April-October. Values for the upper reservoir increased into the upper half of the eutrophic range in June, September, and October while values for the lower reservoir were in the upper half of the eutrophic range during the months of May and October only.[3]

Dissolved oxygen concentrations in the upper reservoir decreased from April through July with values from July (5.44 mg/l) just above the criterion limit of 5.0 mg/l. Concentrations in the upper reservoir were higher from August through October. In the lower reservoir, dissolved oxygen concentrations increased from April through May then decreased through August. Concentrations from July through September (5.11, 4.62, and 5.51 mg/l, respectively) were near or below the criterion limit. Dissolved oxygen concentrations in the lower reservoir during October increased from previous months. Depth profiles of dissolved oxygen and temperature from the dam forebay of Mitchell Reservoir indicated essentially isothermal and isochemical conditions during April. Weak thermal and chemical stratification began to develop in the water column in May with chemical stratification becoming more developed in July. Weak chemical stratification persisted through October. Essentially, isothermal conditions returned in August and continued through the end of sampling in October. Anoxic conditions developed at the bottom of the water column in July. Highest water column temperatures and lowest water column dissolved oxygen concentrations occurred in July. Anoxic conditions developed at the bottom of the water column in July.[3]

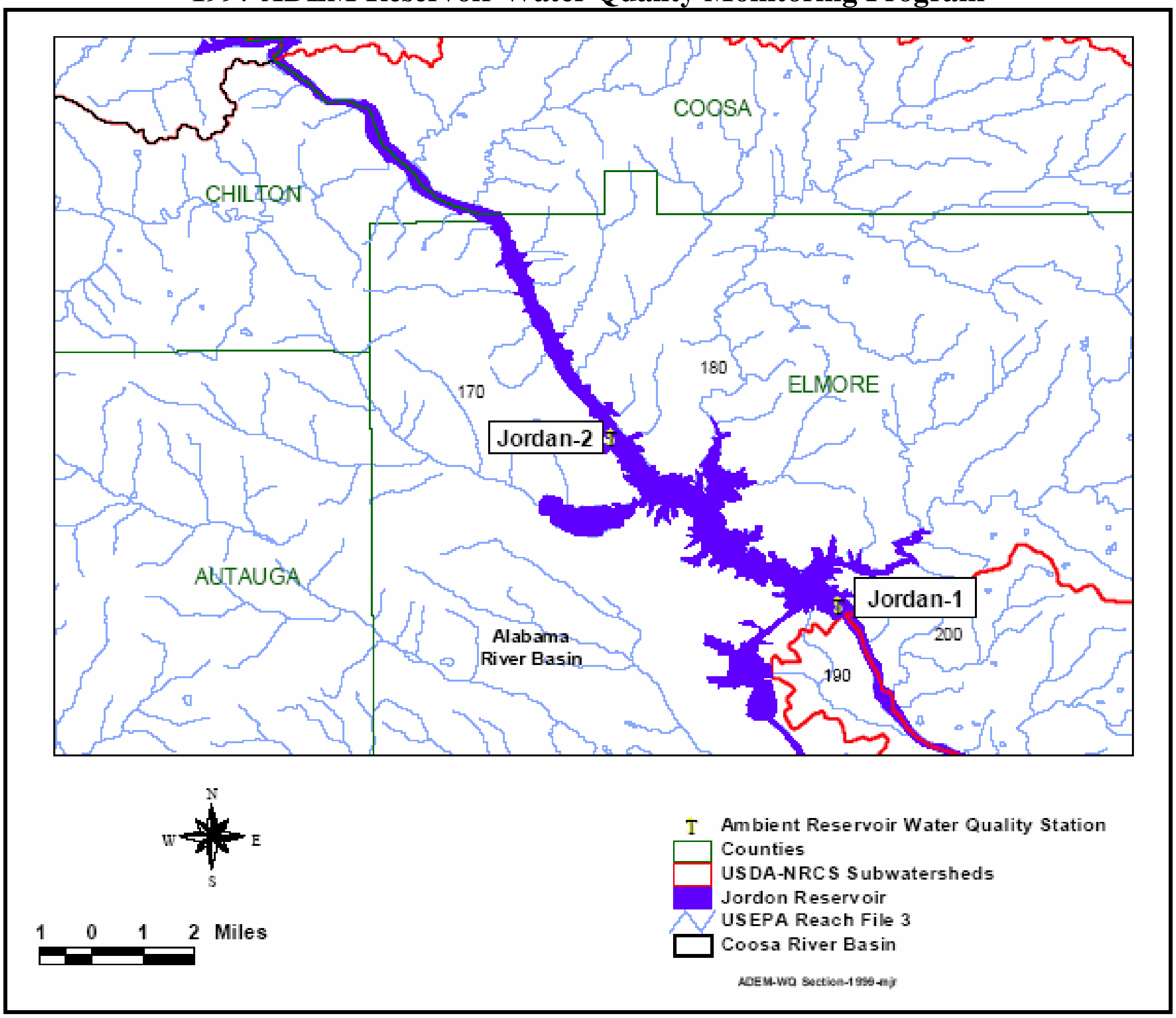
Lake Jordan. Two sites were sampled in the Jordan reservoir as shown in Figure 127. Station 1, in Elmore County, was the deepest point in the main river channel at the dam forebay; Station 2, also in Elmore County, was the deepest point in the main river channel upstream of the confluence of Weoka Creek and the Coosa River.[3]

Overall, nutrient concentrations in Jordan Reservoir were lowest of all Coosa reservoir locations. Mean total nitrogen concentrations in the upper reservoir were 0.28 mg/l and at the lower reservoir were 0.23 mg/l. Monthly total nitrogen concentrations at both reservoir locations were variable during the months sampled. The highest concentrations at both locations occurred in August. Lowest concentrations in the upper reservoir occurred in September and October and in the lower reservoir in May and September. Mean total phosphorus concentrations in Jordan Reservoir were, along with those of Logan Martin Reservoir, the lowest of Coosa reservoir locations, at 0.07 mg/l in the upper reservoir and 0.05 mg/l in the lower reservoir. Monthly total phosphorus concentrations at both locations decreased from April through June then increased in July and August. In September, total phosphorus decreased then increased again in October.

Highest total phosphorus concentrations at both locations occurred in August. Lowest total phosphorus concentrations in the lower reservoir occurred in May in the lower reservoir and in the upper reservoir, in June.[3]

Figure 127:

Sampling Stations on Lake Jordan
1997 ADEM Reservoir Water Quality Monitoring Program



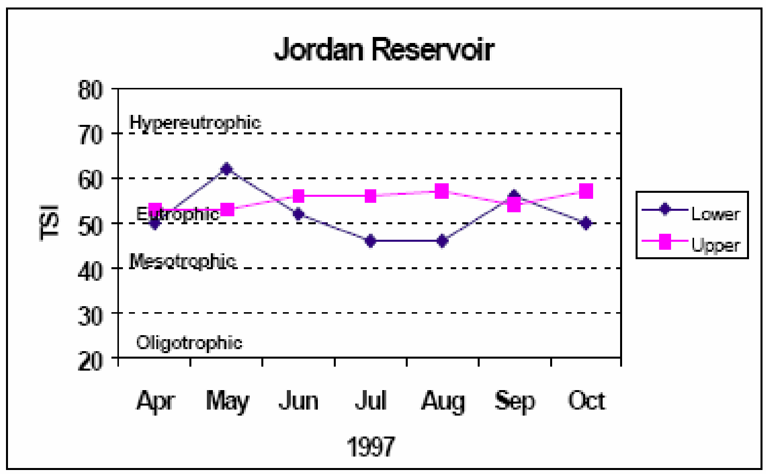
Source: Alabama Department of Environmental Management. Intensive Water Quality Survey of Coosa and Tallapoosa River Reservoirs, 1997. March 24, 1999.

Nitrogen was indicated as the limiting nutrient in the upper reservoir during August with phosphorus the limiting nutrient in the lower reservoir. Mean maximum standing crop values for the upper reservoir, at 6.80 mg/l, and the lower reservoir, at 6.28 mg/l, were well above the maximum 5.0 mg/l level suggested to assure protection from nuisance algal blooms and fish-kills in southeastern lakes.[3]

Mean chlorophyll *a* concentrations in Jordan Reservoir were, along with those of upper Weiss reservoir, the lowest of Coosa reservoir locations. Within the reservoir, the mean value for the upper reservoir, at 12.6 mg/l, was greater than that of the lower reservoir, at 10.2 mg/l. Monthly chlorophyll *a* concentrations in the upper reservoir were similar from April through October. Concentrations in the lower reservoir were more variable with highest concentrations occurring in May and lowest concentrations occurring in July and August. The trophic state index values derived from these concentrations indicated that the trophic state of Lake Jordan was lowest of the Coosa reservoirs with values generally within the lower eutrophic to mesotrophic range. Trophic state index values for the lower reservoir varied greatly from April through October, ranging from the upper eutrophic range in May to the mesotrophic range in July and August.[3]

Figure 128:

Lake Jordan Trophic State Index, 1997



Source: Alabama Department of Environmental Management. Intensive Water Quality Survey of Coosa and Tallapoosa River Reservoirs, 1997. March 24, 1999.

Dissolved oxygen concentrations in the upper reservoir declined from April through July and were variable from August through October. Concentrations during July, at 5.33 mg/l, and September, at 5.10 mg/l, were near the criterion limit of 5.0 mg/l. In the lower reservoir, dissolved oxygen concentrations increased in April and May then decreased through August. Concentrations in the lower reservoir in July, at 4.67 mg/l, and August, at 4.83 mg/l, were below the criterion limit of 5.0 mg/l. Depth profiles of dissolved oxygen and temperature from the dam forebay of Jordan Reservoir indicated isothermal and isochemical conditions in April. Chemical stratification developed in May and persisted through September. Weak thermal stratification developed in May and persisted through August. Anoxic conditions developed at the bottom of the water column in July and August. Lowest water column dissolved oxygen concentrations occurred in July and highest water column temperatures occurred in August.[3]

ADEM Nonpoint Source Assessment Program

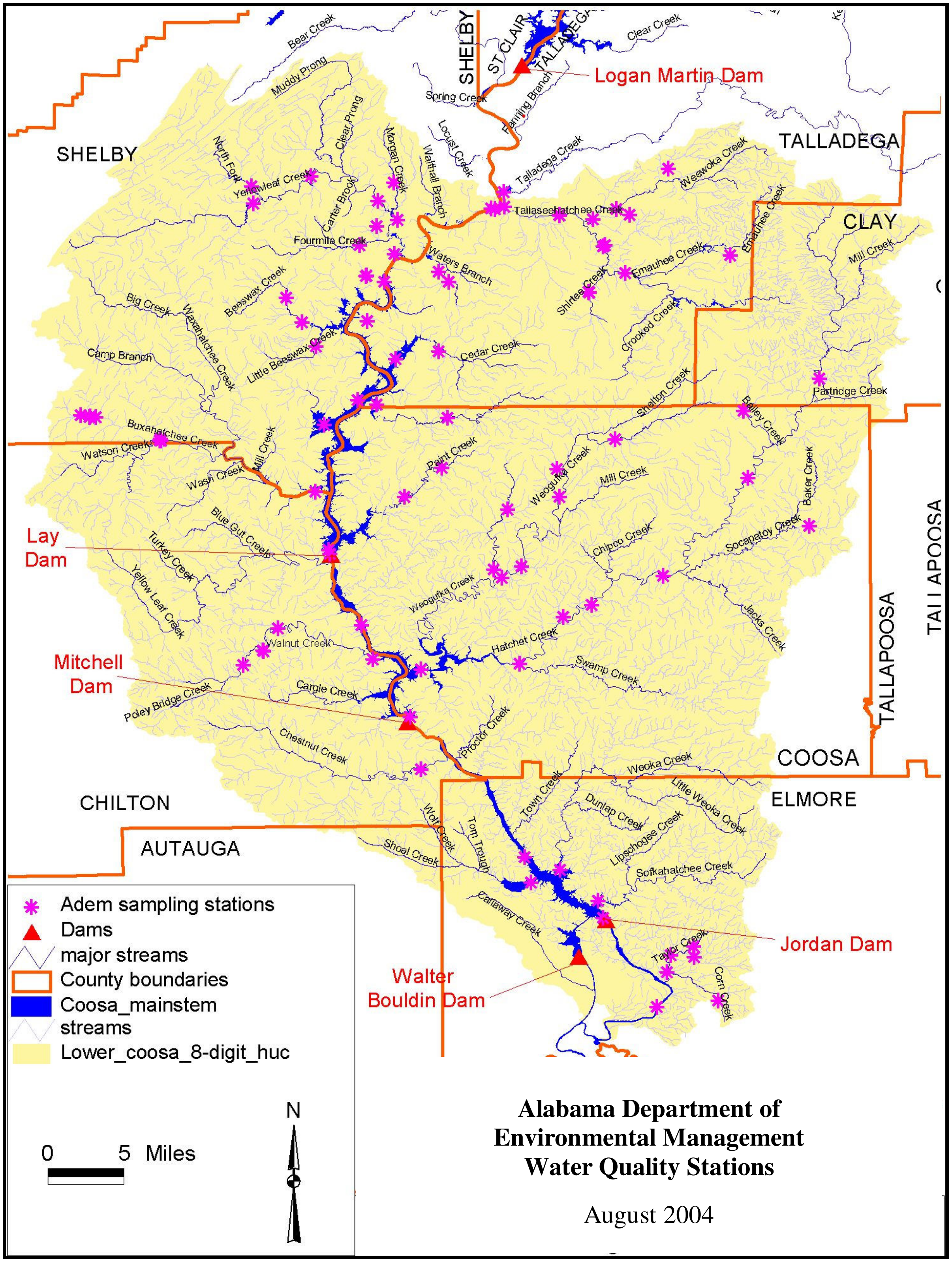
During 2000, the Aquatic Assessment Unit of the Field Operations Division completed a basin-wide screening assessment for the Coosa River Basin. The next scheduled assessment of the Coosa River basin based on the five-year rotational schedule will be during 2005. In 2002, the Alabama Department of Environmental Management released the *Surface Water Quality Screening Assessment of the Coosa River Basin – 2000 (Screening Assessment)*, which is the resulting report of the basin assessment. In the report, each of the watersheds in the Coosa basin was rated by its potential for nonpoint source pollution. The report then identifies priority watersheds based on the monitoring results and the potential for nonpoint source pollution. Seven priority watersheds were identified in the whole Coosa River basin, of which three were in the Lower Coosa River Basin:

- Buxahatchee Creek Watershed
- Weogufka Creek Watershed, and
- Taylor Creek Watershed.

Not all of the watersheds in the basin were sampled during the assessment process. Instead recent monitoring from other sources was utilized where available. A review of existing data indicated that bioassessments have been conducted recently within two of the watersheds in the Lower Coosa River Basin. One location was monitored as part of the ADEM Ecoregional Reference Reach Project. Two sites were assessed as part of the 1999 monitoring in support of CWA §303(d) listing and de-listing decisions, and one site has been used to conduct annual field quality assurance/quality control and training for AAU aquatic macroinvertebrate assessments. Historical water quality data are available from 11 of the watersheds in the. In addition to the bioassessments sites which also generally include water quality samples, two sites (one on Shirtee Creek and one on Tallasehatchee Creek) are included in the Ambient Trend Monitoring Program. Five sites in five watersheds were assessed by Auburn University as part of the 1999 University Reservoir Tributary Nutrient Study. Eight sites were visited and seven were assessed using water quality parameters as part of the ALAMAP program. Fourteen sites with one on the Coosa River were assessed as part of the 1996 Clean Water Strategy. In addition, during 2000, the ADEM Field Operations Division also conducted embayment monitoring of nine major tributaries to the Coosa River.[4] A list of the previous data collected including the streams that were monitored and the monitoring results for the Lower Coosa River Basin can be found in Appendix C.

Five of the 20 watersheds in the Lower Coosa River Basin were targeted in the assessment because they had a high or moderate estimated potential for nonpoint source impairment, low potential from urban or point sources, and relatively little recent assessment data. Of these, one watershed was not assessed due to dry conditions and one was not assessed due to the relatively small drainage area. Five watersheds were added to the assessment for sampling of existing or candidate ecoregional reference stations. The watersheds that were sampled (or sampling was attempted) during the assessment process were Tallassehatchee Creek, Yellowleaf Creek, Kahatchee Creek, Beeswax Creek, Cedar Creek, Peckerwood Creek, Buxahatchee Creek, Middle Hatchet Creek, Weogufka Creek, Lower Hatchet Creek, Walnut Creek, and Taylor Creek.[4] All of ADEM's existing monitoring locations, as of August 2004, are shown in Figure 129.

Figure 129:



Source: Alabama Department of Environmental Management. August 2004

In the ten watersheds, 38 sampling stations were evaluated based on habitat, chemical/physical, and biological indicators of water quality. Habitat quality at 35 of the stations was assessed as excellent or good. Aquatic macroinvertebrate community assessments were evaluated from 23 stations. Result of these assessments indicated the macroinvertebrate community was in excellent condition at 10 stations, good at six stations, fair at six stations, and poor at one station. See Figure 130. Results of the fish index of biotic integrity (IBI) assessments conducted at five of these sites indicated the fish community was in good condition at one station, and fair/good or fair condition at four stations. At three of the five stations where both macroinvertebrates and fish communities were assessed, results of the fish IBI assessments indicated a greater degree of impairment. Overall, of the 23 stations in which the macroinvertebrate community was assessed, 14 were rated as excellent or good, eight were assessed as fair, and one was assessed as poor. Of the nine stations assessed as fair or poor, four were primarily impacted by urban runoff or point sources.[4]

According to the *Screening Assessment*, the primary nonpoint source concerns within the Lower Coosa River Basin were from sedimentation, mining and forestry practices. Six of the watersheds had a moderate or high potential for impairment from nonpoint sources. These watersheds are Tallassehatchee Creek, Walthall Branch, Kahatchee Creek, Beeswax Creek, Cedar Creek, and Taylor Creek. All of these watersheds, except for Taylor Creek are located in the northern part of the basin area. Eight watersheds had a moderate or high potential for impairment from urban or residential sources; and, eight watersheds had low potential for impairment for both point and nonpoint sources.[4]

The basin assessment worksheets completed by the Soil and Water Conservation Districts in 1998 identified nine of the watersheds as top-five priorities. The watersheds are Tallassehatchee Creek, Yellowleaf Creek, Beeswax Creek, Peckerwood Creek, Waxahatchee Creek, Middle Hatchet Creek, Weogufka Creek, Walnut Creek, and Chestnut Creek. Animals having access to streams, and erosion and sediment from roads/road banks and urban development, were indicated as the most common concerns within the watersheds.[4] A summary of the nonpoint source assessment for each of the watersheds in the basin follows.

Figure 130:

Summary of Assessments Conducted in Lower Coosa River Basin, 2000
(Includes selected biological and chemical data collected since 1995.)

Watershed	Station Number	Habitat	Macro-invertebrates	Fish	Chemical Data Available (X)	Overall Assessment
Tallaseehatchee Creek (010)	EMHT-16	GOOD	GOOD	---	FP ONLY	GOOD
	SHRT-1*	EXCELLENT	FAIR	---	X	FAIR
	TLST-1	GOOD	EXCELLENT	---	X	EXCELLENT
	TLST-19	E	EXCELLENT	G	X	GOOD
	TLST-2	E	EXCELLENT	---	X	GOOD
	TLST-3	---	---	---	X	---
	WWOT-37	E	EXCELLENT	---	FP ONLY	EXCELLENT
	WWOT-1	F	---	---	X	---
Yellowleaf Creek (030)	FRMS-9	EXCELLENT	EXCELLENT	---	FP ONLY	EXCELLENT
	YLFS-1	EXCELLENT	---	---	X	---
	YLFS-2	EXCELLENT	---	---	X	---
	YLFS-3	EXCELLENT	GOOD	---	X	GOOD
	YLFS-4	EXCELLENT	GOOD	---	X	GOOD
Beeswax Creek (050)	BWXS-8	EXCELLENT	GOOD	---	FP ONLY	GOOD
	LBWS-9	EXCELLENT	EXCELLENT	---	FP ONLY	EXCELLENT
	CO02U3-18	GOOD	---	---	X	---
Cedar Cr (060)	CDRT-22	GOOD	EXCELLENT	--	FP ONLY	EXCELLENT
Peckerwood Creek (070)	PNTC-11	GOOD	EXCELLENT	---	X	EXCELLENT
	CO04U1	EXCELLENT	---	---	X	---
Buxahatchee Creek (090)	BXHS-1	---	---	---	X	---
	BXHS-2*	EXCELLENT	---	---	X	---
	BXHS-3*	EXCELLENT	---	---	X	---
	BXHS-4*	EXCELLENT	GOOD	---	X	GOOD
	WTNS-1	EXCELLENT	GOOD	FAIR/GOOD	X	FAIR
Waxahatchee Creek (100)	CO01U3-31	GOOD	---	---	X	---
Upper Hatchet Creek (110)	CO03U1	GOOD	---	---	X	---
Middle Hatchet Creek (130)	JNSC-1	EXCELLENT	EXCELLENT	---	X	EXCELLENT
Weogufka Creek (140)	WGFC-1	GOOD	EXCELLENT	FAIR	X	FAIR
	CO03U3-47	GOOD	---	---	X	---
Walnut Creek (160)	WNTC-1	EXCELLENT	FAIR	---	X	FAIR
	WNTC-2*	EXCELLENT	FAIR	---	X	FAIR
	WNTC-3*	EXCELLENT	FAIR	---	X	FAIR
	WNTC-4*	EXCELLENT	---	---	X	---
Chestnut Creek (170)	CO05U1	EXCELLENT	---	---	X	---
Taylor Creek (200)	QFMC-1	GOOD	POOR*	---	---	POOR**
	CO04U4-31	GOOD	---	---	X	---
	TYC-1	EXCELLENT	FAIR	FAIR	X	FAIR
	TYC-2	EXCELLENT	FAIR	FAIR/GOOD	X	FAIR

* Indicates sample collection downstream of point source.
** Sample collected upstream of beaver dam; 'Poor' condition considered due to natural causes.
Source: ADEM Aquatic Assessment Unit. Surface Water Quality Screening Assessment of the Coosa River Basin – 2000;
Table 11c. 2002.

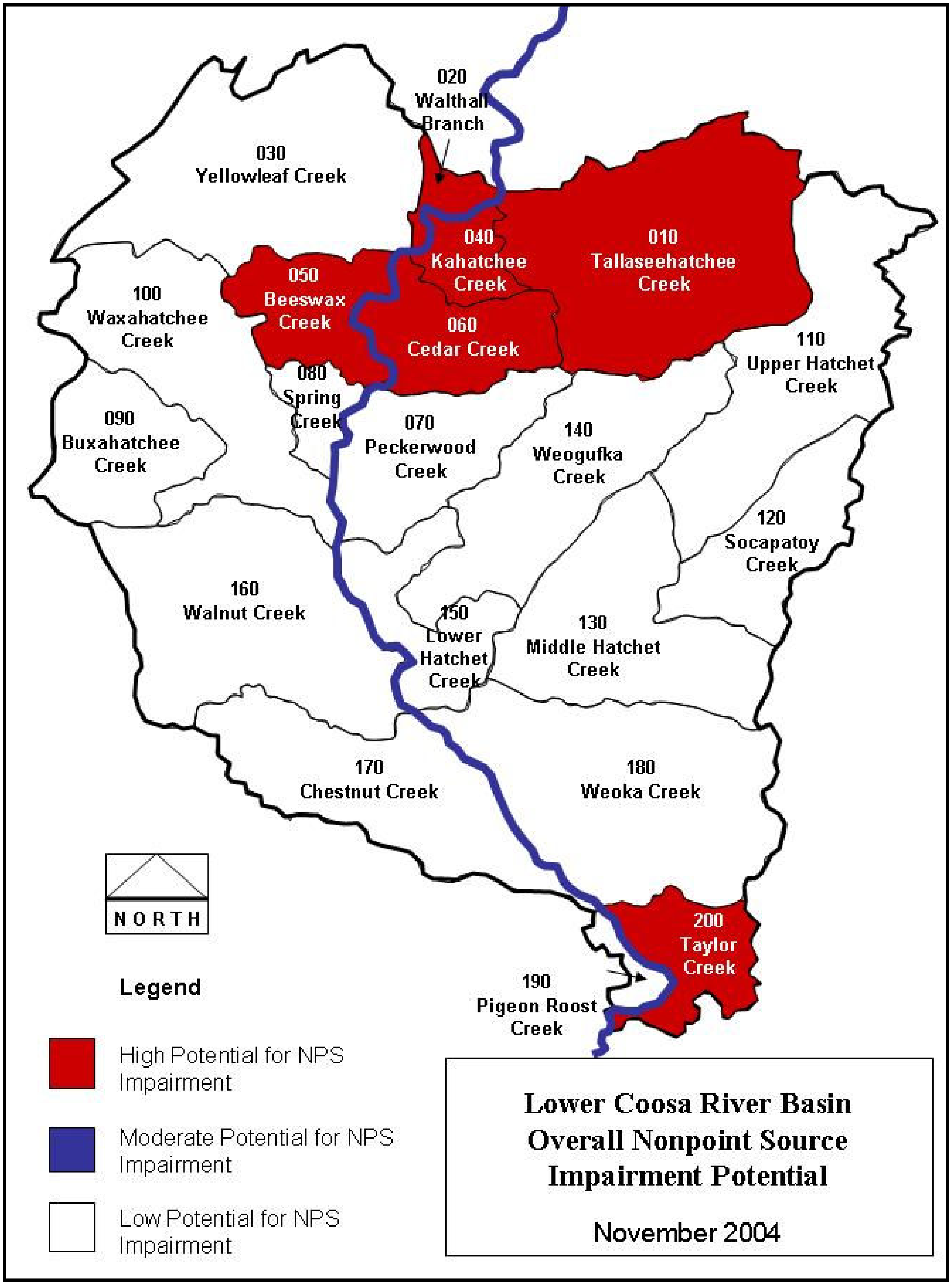
Figure 131:

Estimate of Potential Sources of NPS Impairment by Watershed

Watershed	Overall Potential of NPS Impairment	POTENTIAL SOURCES OF IMPAIRMENT								
		Rural Land Uses						Urban / Suburban / Residential Land Uses		
		Animal Husbandry	Row Crops	Pasture Runoff	Mining	Forestry Practices	Sedimentation	Urban	Development	Septic Tank Failure
010	H	H	L	L	H	H	L	M	M	L
020	H	M	M	M	L	---	M	L	M	L
030	L	L	L	M	L	---	M	M	H	L
040	H	L	L	M	M	H	M	M	M	L
050	H	L	L	M	L	---	H	M	M	L
060	H	L	L	M	L	H	M	L	L	L
070	L	L	L	L	L	M	L	L	L	L
080	L	L	L	M	L	---	M	M	M	L
090	L	L	L	L	M	L	M	L	M	M
100	L	L	L	L	M	L	M	L	M	L
110	L	L	L	L	L	M	L	L	L	L
120	L	L	L	L	L	M	L	L	L	L
130	L	L	L	L	L	M	L	L	L	L
140	L	L	L	L	L	M	L	L	L	L
150	L	L	L	L	L	M	L	L	L	L
160	L	L	M	L	L	M	L	L	M	M
170	L	L	M	L	L	L	L	M	M	L
180	L	L	L	L	L	L	L	L	L	L
190	L	L	M	L	L	---	L	H	M	L
200	H	L	L	M	L	---	H	M	M	L

Source: Alabama Department of Environmental Management, Field Operations Division, Aquatic Assessment Unit. Surface Water Quality Screening Assessment of the Coosa River Basin – 2000. Table 5c. April 1, 2002.

Figure 132:



Source: Data drawn from Alabama Department of Environmental Management, Field Operations Division, Aquatic Assessment Unit. Surface Water Quality Screening Assessment of the Coosa River Basin – 2000. Table 5c. April 1, 2002.

Tallaseehatchee Creek (010). At the time of the screening, seven construction/stormwater authorizations, two non-coal mining/stormwater authorizations, four mining NPDES permits, five municipal NPDES permits, one semi public / private NPDES permit, and one industrial NPDES permit had been issued in the watershed. Since 1990, various streams and tributaries in this watershed have been several times in connection to an ADEM project. During 2000, eight stations on four streams were evaluated as part of the basin assessment project and as part of the Clean Water Act Section 303(d) sampling project. Other recently assessed sites include the Tallaseehatchee Creek embayment in 2000, stations on Shirtee Creek and Tallaseehatchee Creek as part of the ambient water quality program between 1990 and 2000, and Tallaseehatchee Creek in 1999.[4]

Overall, the watershed was rated as having a high potential for impairment from nonpoint source pollution, due to mining land uses and forestry activities. Of the four streams sampled during the assessment project, only Emauhee Creek did not show signs of impairment. In the remaining three streams, habitat quality was rated as good to excellent and the macroinvertebrate and communities were fair to excellent. Water quality parameters reported elevated concentrations of nutrients in Shirtee, Tallaseehatchee and Weoka Creeks and high conductivity measurements in Tallaseehatchee and Weoka Creeks.[4]

Walthall Branch (020). One construction/stormwater authorization had been issued in the watershed and was current at the time of the sampling. No historical data was available and no assessments were conducted in Walthall Branch during the assessment project. Overall, the watershed was rated as having a high potential for nonpoint source impairment although estimates of animal concentrations, sediment and agricultural land all had moderate ratings.[4]

Yellowleaf Creek (030). At the time of the screening, 27 construction/stormwater authorizations, two non-coal mining/stormwater authorizations, one semi-public/private NPDES permit and one industrial NPDES permit had been issued in the watershed. Seven sites in the watershed were evaluated during the assessment process. Also in 2000-2001, one site on Yellowleaf Creek was assessed under the ALAMAP program; four sites were assessed as part of the Section 303(d) process; one station was assessed in the Yellowleaf Creek embayment as part of the ADEM Reservoir Tributary Monitoring effort; and, one candidate ecoregional site on Fourmile Creek was assessed.[4]

Overall, the watershed was rated as having a low potential for nonpoint source impairment. Although estimates of animal concentrations were low, estimates of sediment and pasture land use were rated as moderate. Habitat quality of the four streams was assessed as excellent. Water quality parameters indicated low dissolved oxygen and high concentrations of nutrients during some months in the North Fork of Yellowleaf Creek and Yellowleaf Creek; low dissolved oxygen and elevated total Kjeldahl nitrogen in some months in the South Fork of Yellow Creek. In April 2001, Yellowleaf Creek had an elevated fecal coliform count, which was probably attributable to high flow conditions at the time of sampling.[4]

Kahatchee Creek (040). Three construction/stormwater authorizations and one municipal NPDES permit were in place at the time of the assessment. Although no samples were taken in the 2000 basin assessment, two historical sites were evaluated. Both were on the Coosa River near Childersburg: one ambient monitoring station and a station included in the 1996 ADEM Clean Water Strategy. Overall, the watershed was rated high for potential for nonpoint source impairment due to forestry activities. Estimates of nonpoint source impairment potential from concentrations of animals was low and estimates of sedimentation and mining and pasture land uses nonpoint source potential were moderate.[4]

Beeswax Creek (050). At the time of the basin assessment, four construction/stormwater authorizations, and one semi-public/private NPDES permit had been issued. Two sites in the watershed were included in the basin assessment project: Beeswax Creek and Little Beeswax Creek. Data from four other sites is also available. Overall, the watershed was rated as having a high potential for nonpoint source impairment due to sedimentation. The estimates for nonpoint source impairment from concentrations of animals was low and the estimate for nonpoint source impairment potential from pasture land uses was moderate. Habitat quality and macroinvertebrate assessment in both streams assessed as a part of the project were rated excellent. Field parameter data collected at the site during the assessment did not indicate impairment.[4]

Cedar Creek (060). Two construction/stormwater authorizations and two mining NPDES permits had been issued in the watershed at the time of the basin assessment. One site on Cedar Creek was assessed as a part of the project. No other historical data was available. The watershed has a high potential, overall, for nonpoint source impairment due to forestry activities. Estimates for nonpoint source impairment potential due to animal concentrations were low and moderate due to sedimentation and pasture land uses. Habitat quality at Cedar Creek was rated as good during the assessment and the aquatic macroinvertebrate community was rated as excellent. Field parameters data collected at the site during the assessment did not indicate impairment.[4]

Peckerwood Creek (070). Two construction/stormwater authorizations had been issued in the watershed at the time of the basin assessment. One site on Panther Creek was assessed as a part of the project. Historical data is available for a site on Peckerwood Creek as a part of the 1997 ALAMAP program and a Peckerwood embayment location was assessed in 2000 as part of the ADEM Reservoir Tributary Monitoring effort. Overall, the watershed has a low potential for nonpoint source impairment. Only estimates for nonpoint source impairment potential due to forestry activities were moderate. Habitat quality at Panther Creek was assessed as good during the assessment and the aquatic macroinvertebrate community was rated as excellent. Field parameters data collected at the site during the assessment did not indicate impairment, however, fecal coliform counts were elevated but no indications of possible sources were noted.[4]

Spring Creek (080). One construction/stormwater authorization had been issued in the watershed at the time of the basin assessment. No assessments were conducted in the watershed as a part of the project and no historical data is available. Overall, the watershed has a low potential for nonpoint source impairment. Only estimates for nonpoint source impairment potential due to sedimentation and pasture land use were moderate.[4]

Buxahatchee Creek (090). Seven construction/stormwater authorizations, one municipal and one mining NPDES permit had been issued in the watershed at the time of the basin assessment. A 13-mile segment of Buxahatchee Creek was included on the 2000 Section 303(d) list with partial support status due to nutrients from municipal and urban runoff/storm sewer sources. Five sites were assessed as part of the basin assessment project: four sites on Buxahatchee Creek and one on Watson Creek. Three of these sites have historical data from past projects. Overall, the watershed has a low potential for nonpoint source impairment, although estimates for nonpoint source impairment potential due to sedimentation and mining land uses were moderate.[4]

Habitat quality at all four sites evaluated was assessed as excellent. The aquatic macroinvertebrate community was rated as good in Watson Creek and good at the lowest station on Buxahatchee Creek. The fish community was rated as fair/good on Watson Creek. Water quality data collected at all four sites indicated elevated nutrient levels and elevated fecal coliform counts were noted at the two middle stations on Buxahatchee Creek. The two middle stations on Buxahatchee Creek are directly upstream and downstream of the discharge point of the Calera Wastewater Treatment Plant, which was noted as experiencing treatment failures during the assessment period. The elevated fecal coliform counts are reflective of that treatment failure. The Buxahatchee Creek watershed was identified as a nonpoint source priority watershed due to biological conditions possibly related to nutrient enrichment within the Watson Creek portion of the watershed.[4]

Waxahatachee Creek (100). At the time of the basin assessment, 11 construction/stormwater authorizations, one non-coal mining/stormwater authorization, and one mining and one municipal NPDES permit had been issued in the watershed. No sites were assessed as a part of the basin assessment project, however, historical data was used to evaluate three sites. Data is available for a site on Mud Creek as a part of the 1997 ALAMAP program; for one site in the embayment of Waxahatchee Creek as part of the ADEM Reservoir Tributary Monitoring effort in 2000; and for one site on Waxahatchee Creek as part of the ADEM Reservoir Tributary Monitoring effort. Overall, the watershed has a low potential for nonpoint source impairment. Only estimates for nonpoint source impairment potential due to sedimentation and mining land uses were moderate.[4]

Upper Hatchet Creek (110). At the time of the basin assessment, three construction/stormwater authorizations, one non-coal mining/stormwater authorization, and one semi-public/private municipal NPDES permit had been issued in the watershed. No sites were assessed as a part of the basin assessment project. Historical data however is for seven sites on four streams. Two sites on Hatachet Creek were assessed during the ADEM 1996 Clean Water Strategy Sampling. One site was visited on an unnamed tributary to Hatchet Creek during the 1997 ALAMAP program. One site on each of the East and West Forks of Hatchet Creek and two additional sites on Hatchet Creek were assessed during the Geological Survey of Alabama’s 1997 assessment of the Hatchet Creek Drainage. Overall, the watershed has a low potential for nonpoint source impairment. Only estimates for nonpoint source impairment potential due to forestry activities was moderate.[4]

Socapatoy Creek (120). Three construction/stormwater authorizations, one non-coal mining/stormwater authorization, and one municipal NPDES permit had been issued in the watershed at the time of the basin assessment. No sites were assessed as a part of the basin assessment project. Historical data is available for two sites on Socapatoy Creek as part of the ADEM 1996 Clean Water Strategy Sampling. One of these sites was also assessed during the Geological Survey of Alabama's 1997 assessment of the Hatchet Creek Drainage. Overall, the watershed has a low potential for nonpoint source impairment. Only the estimate for nonpoint source impairment potential due to forestry activities was moderate.[4]

Middle Hatchet Creek (130). Four construction/stormwater authorizations, one mining NPDES and one municipal NPDES permit had been issued in the watershed at the time of the basin assessment. A proposed ecoregional reference site on Jones Creek was assessed as a part of the project. Historical data is available for seven sites in the watershed: two sites on Hatchet Creek were assessed during the ADEM 1996 Clean Water Strategy sampling; one site on Hatchet Creek was included in the 1999 University Reservoir Tributary Nutrient Study; and three sites on Hatchett Creek and one site on Swamp Creek were assessed during the Geological Survey of Alabama's 1997 assessment of the Hatchet Creek. Overall, the watershed has a low potential for nonpoint source impairment. Only the estimate for nonpoint source impairment potential due to forestry activities was moderate. Habitat quality and the aquatic macroinvertebrate community at Jones Creek were both assessed as excellent. Water quality data collected during the assessment indicated that there may be nutrient enrichment, however, the elevated turbidity measurement and fecal coliform counts indicate that a recent rain event may have occurred prior to sampling.[4]

Weogufka Creek (140). Three construction/stormwater authorizations and one semi-public/private NPDES permit had been issued in the watershed at the time of the basin assessment. One station on Weogufka Creek, near Stewartville, was assessed as part of the project as an historical ecoregional reference site. Historical data is available for six reaches on three streams in the watershed: two sites on Finikochika Creek and two sites on Weogufka Creek were assessed during the ADEM 1996 Clean Water Strategy sampling; one site on Stewart Creek was included in the 1999 ALAMAP project; and, data was collected at one site in the 1999 University Reservoir Tributary Nutrient Study. Overall, the watershed has a low potential for nonpoint source impairment. Only the estimate for nonpoint source impairment potential due to forestry activities was moderate. Habitat quality and the aquatic macroinvertebrate community at Weogufka creek were assessed as good and excellent, respectively. The fish community was assessed as fair. Historical water quality data collected between 1993 and 2000 does not indicate impairment. Water quality data collected during the assessment reflected that dissolved oxygen measurements in September 2000 were low. Factors that could have contributed to the low dissolved oxygen include a beaver dam upstream of the sampling site and low flow conditions.[4]

Lower Hatchet Creek (150). One construction/stormwater authorization had been issued in the watershed at the time of the basin assessment. No sites were assessed as a part of the basin assessment project. Historical data is available for one embayment location for Hatchet Creek which was assessed as part of the ADEM Reservoir Tributary Monitoring effort.

Overall, the watershed has a low potential for nonpoint source impairment, however, the estimate for nonpoint source impairment potential due to forestry activities was moderate.[4]

Walnut Creek (160). Four construction/stormwater authorizations and two municipal NPDES permits had been issued in the watershed at the time of the basin assessment. Five sites were assessed in 2000, although none were assessed through the basin assessment project. One embayment location of Walnut Creek was assessed as part of the ADEM Reservoir Tributary Monitoring Effort and four sites on Walnut Creek were assessed during the 2000 Section 303(d) monitoring program. Overall, the watershed has a low potential for nonpoint source impairment. The local estimates for land usage for row crops and forestry activities, however, indicate a moderate potential for nonpoint source impairment potential. Habitat quality was assessed as fair at the four sites where instream bioassessments were conducted. Lab analysis of water quality data collected indicated elevated nitrate/nitrite-nitrogen concentrations at the four sites on Walnut Creek.[4]

Chestnut Creek (170). Six construction/stormwater authorizations and one mining NPDES permit had been issued in the watershed at the time of the basin assessment. No sites were assessed as a part of the basin assessment project. Historical data is available for two sites in the watershed. One site on Chestnut Creek was assessed during the 2000 ALAMAP monitoring effort and one site in the Shoal Creek embayment was assessed as part of the 2000 ADEM Reservoir Tributary Monitoring effort. Overall, the watershed has a low potential for nonpoint source impairment, however, the estimate for nonpoint source impairment potential due to row crop land uses was moderate.[4]

Weoka Creek (180). Three construction/stormwater authorizations had been issued in the watershed at the time of the basin assessment. No sites were assessed as a part of the basin assessment project. Two embayment sites were assessed during 2000, however, for Weoka and Sofkahatchee Creeks as part of the ADEM Reservoir Tributary Monitoring effort. Overall, the watershed has a low potential for nonpoint source impairment.[4]

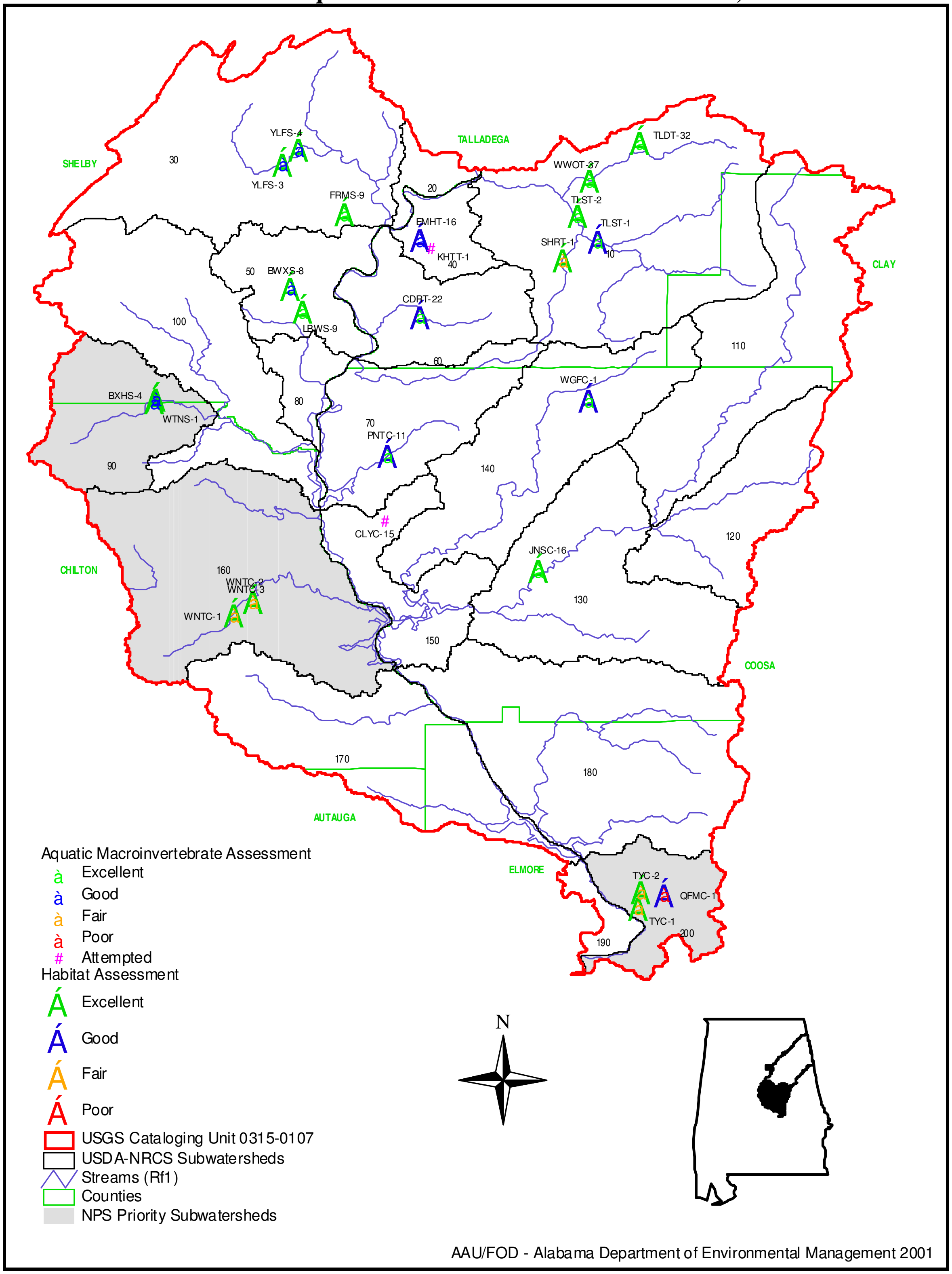
Pigeon Roost Creek (190). Four construction/stormwater authorizations and one municipal NPDES permit had been issued in the watershed at the time of the basin assessment. No sites were assessed as a part of the basin assessment project. Historical data is available for one site, which is a segment of the Coosa River that was assessed as part of the 1999 university Reservoir Tributary Nutrient Study. Overall, the watershed has a low potential for nonpoint source impairment, however, the estimate for nonpoint source impairment potential due to row crop land uses was moderate.[4]

Taylor Creek (200). Thirteen construction/stormwater authorizations and one mining NPDES permit had been issued in the watershed at the time of the basin assessment. No sites were assessed as a part of the basin screening project. Two sites on Taylor Creek were assessed in 1999 during the Section 303(d) monitoring program; a segment of Corn Creek was included n the 2000 ALAMAP monitoring effort and a site on Fourmile Creek was used to conduct aquatic macroinvertebrate and habitat assessment method quality assurance activities. Overall, the watershed has a high potential for nonpoint source impairment. Contributing factors include a high estimate for potential nonpoint source impairment due to sedimentation and moderate potential due to pasture land uses. Habitat quality was assessed as excellent at the Taylor Creek sites and as good at the Fourmile Creek site. Aquatic macroinvertebrate assessments were fair at the Taylor Creek sites and poor at the Fourmile Creek site, while the fish communities were assessed as fair at one Taylor Creek site and fair/good at the other Taylor Creek site. The Fourmile Creek site is upstream of a beaverdam. This reach has been assessed historically as a part of the AAU quality assurance/quality control program for aquatic macroinvertebrate and habitat assessments. The habitat quality and aquatic macroinvertebrate community quality found in the 2000 assessment are consistent with the flow regime and are a natural result.[4]

Water quality data at the lower Taylor Creek site did not indicate any sources of impairment, although the fecal coliform counts were elevated during the high flow sampling events. At the upper Taylor Creek station, fecal coliform counts were high during both high and normal flow sampling events. As a result of the high fecal coliform counts and biological conditions possible related to nutrient enrichment, the Taylor Creek watershed was identified as a nonpoint source priority watershed in the basin assessment project.[4]

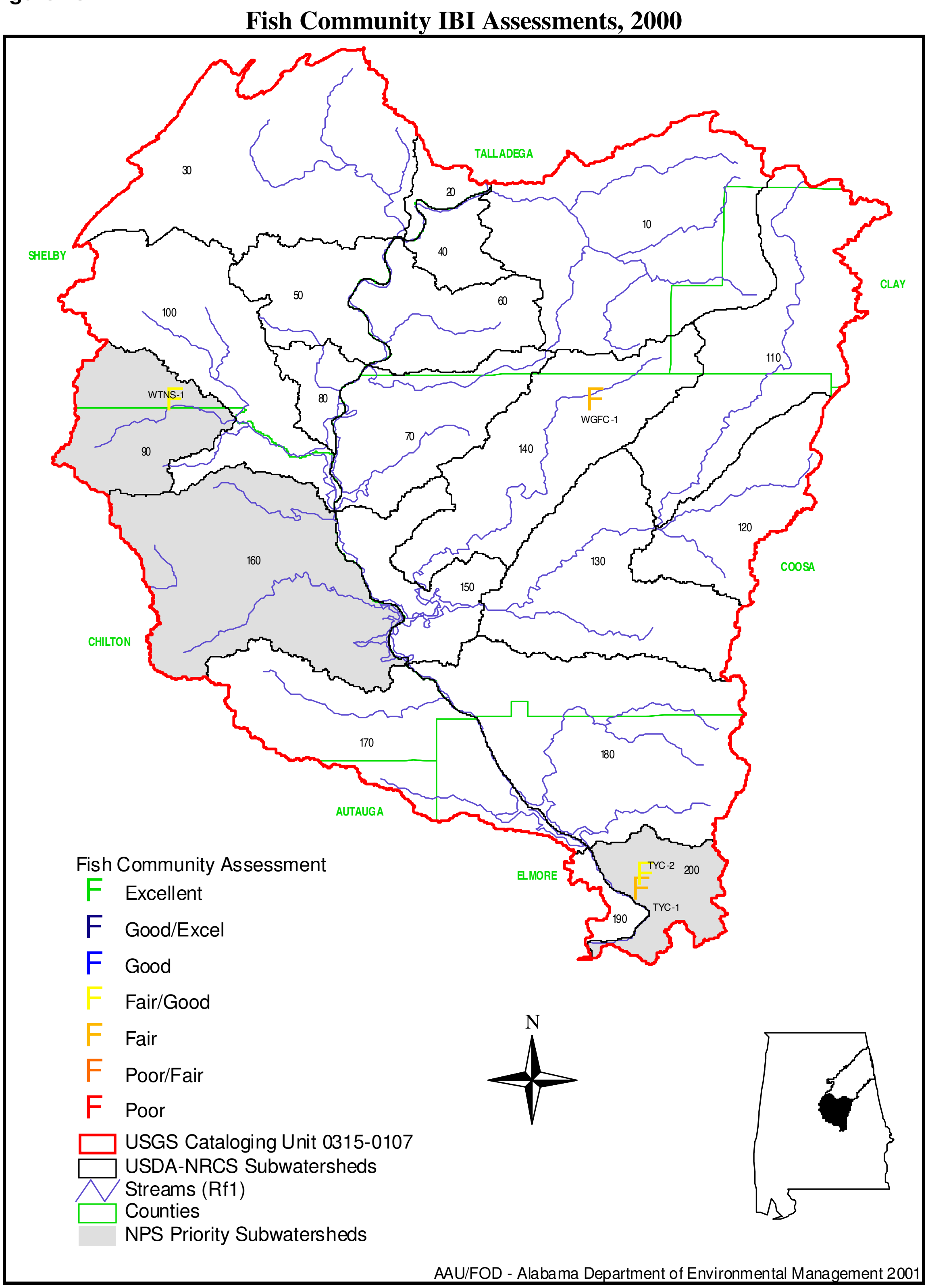
Figure 133:

Habitat and Aquatic Macroinvertebrate Assessments, 2000



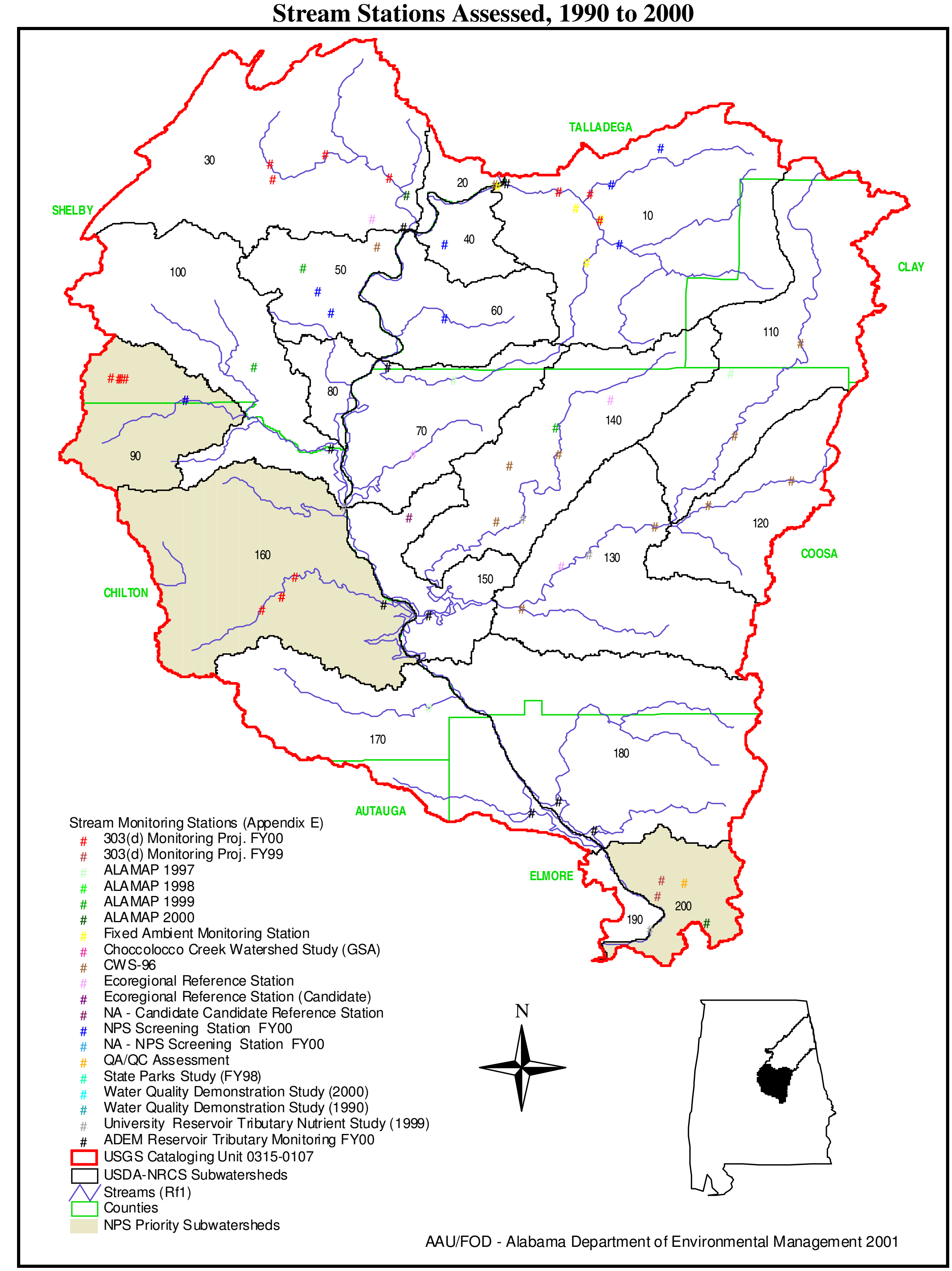
Source: Data drawn from Alabama Department of Environmental Management, Field Operations Division, Aquatic Assessment Unit. Surface Water Quality Screening Assessment of the Coosa River Basin – 2000. Table 5c. April 1, 2002.

Figure 134:



Source: Data drawn from Alabama Department of Environmental Management, Field Operations Division, Aquatic Assessment Unit. Surface Water Quality Screening Assessment of the Coosa River Basin – 2000. Table 5c. April 1, 2002.

Figure 135:



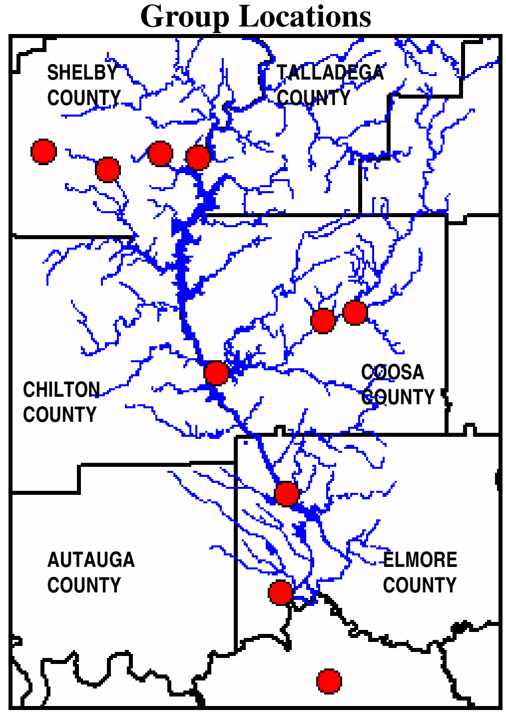
Source: Data drawn from Alabama Department of Environmental Management, Field Operations Division, Aquatic Assessment Unit. Surface Water Quality Screening Assessment of the Coosa River Basin – 2000. Table 5c. April 1, 2002.

Volunteer Monitoring - Alabama Water Watch

Although Alabama's surface and ground waters are monitored through a number of state and federal programs on a regular basis, these programs do not provide funding or manpower to monitor all of the State's waters every month of every year. Moreover, these programs are primarily dependent on federal funding for operation, which leads to a precarious situation as federal funds continually decrease and the needs for monitoring continue to increase. Regular monitoring on a monthly basis is necessary to establish dependable trend data and to detect water quality problems between state monitoring cycles. Volunteer monitoring also provides a cross check for data derived from state and federal monitoring programs.

Established in 1992 at Auburn University with an initial grant from the Alabama Department of Environmental Management and the Environmental Protection Agency, Alabama Water Watch is the state's premiere volunteer monitoring program. The Alabama Water Watch Program is coordinated through Auburn University's Department of Fisheries and Allied Aquacultures and the International Center for Aquaculture and Aquatic Environments. Today, the program is funded by ADEM, EPA, the Alabama Agricultural Experiment Station and the Alabama Cooperative Extension System. The Alabama Water Watch Program is closely aligned with a non-profit organization of volunteer monitors, the Alabama Water Watch Association. The Alabama Water Watch Program provides a wide range of services to volunteer monitors including water quality monitoring training, compilation and maintenance of a massive collection of data on citizen volunteers, their monitoring sites and water quality data, interpretation of technical data gathered by the monitors. The Alabama Water Watch website also provides an online summary of water quality graphs and maps.[5]

Figure 136:
Alabama Water Watch Group Locations



Source: Alabama Water Watch. November 2004. www.alabamawaterwatch.org

Through the Alabama Water Watch program, volunteer monitors can be trained at three levels: water chemistry monitoring, bacteriological monitoring and stream bioassessment. As part of the program's quality assurance procedures, certified volunteer monitors are required to undergo a one-hour recertification workshop annually, at which time all reagents are replaced in the water quality test kits to assure that the kits are maintained at optimum performance. As of November 2004, there are 23 active monitoring sites located in the Lower Coosa River Basin where monthly monitoring is conducted by certified volunteer monitors through the Alabama Water Watch program. Since 1993, there have been ten monitoring groups that have monitored 95 sites at one time or another. The four groups that remain active are: Lake Jordan Home Owners and Boat Owners Association (HOBO), established in 1994; Lake Mitchell Home Owners and Boat Owners Association (HOBO), established in 1995; Lay Lake Home Owners and Boat Owners Association (HOBO), established in 1999; and SOULS Water Watch, established in 2003. Out of 27 total sites, the Lake Jordan HOBO Group has three active sites; out of 21 total sites, the Lake Mitchell HOBO Group has 13 active sites; out of 15 total sites, the Lay Lake HOBO Group has three active sites; and, out of five total sites, the SOULS Water Watch Group has four active sites.[6]

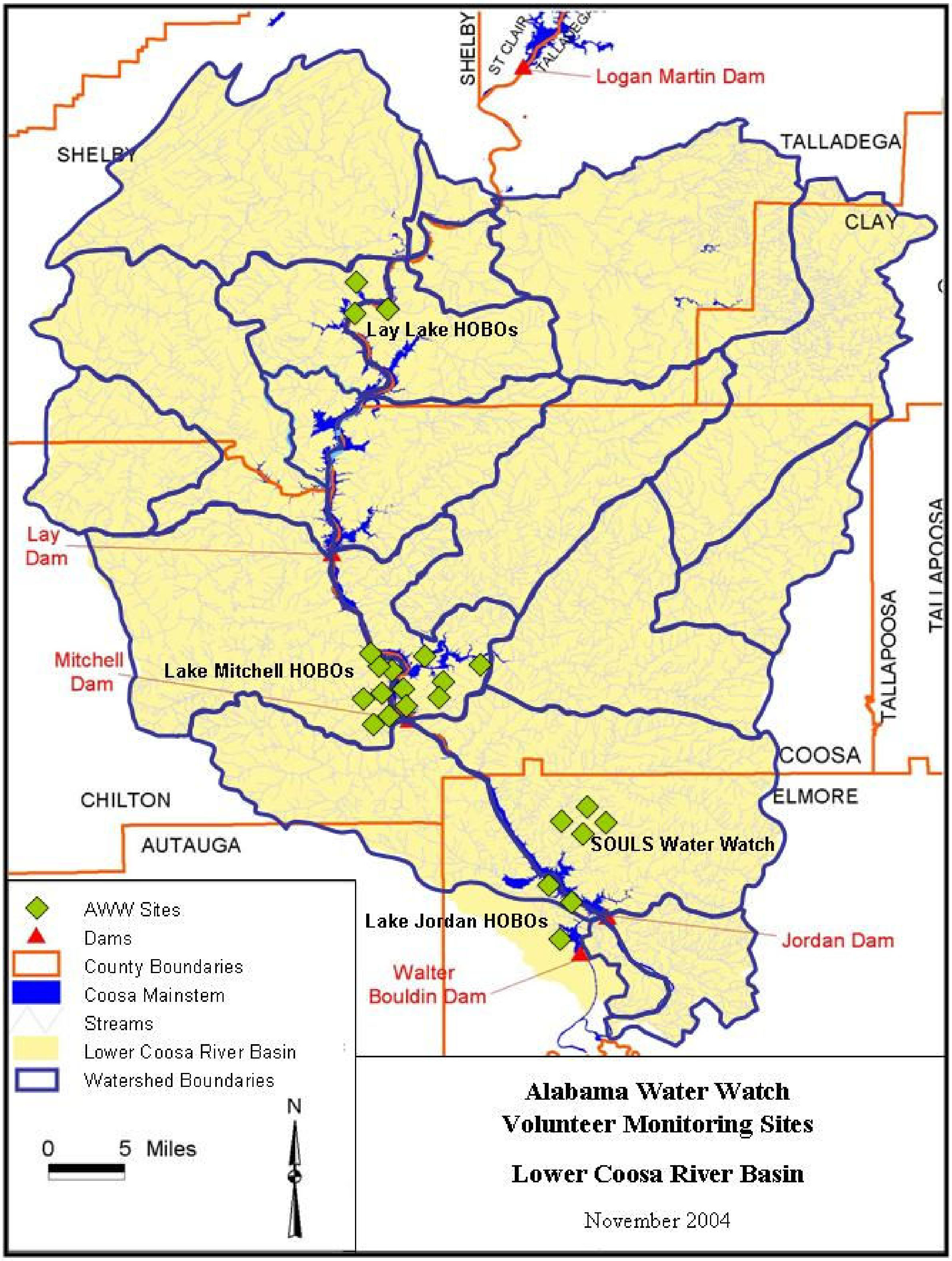
The active monitoring sites of the three lake homeowner and boat owner associations are located primarily on the lakes or on major tributaries very near the lakes. Only the SOULS Water Watch Group monitors a water body that is not on the main stem of the Coosa River, which is Weoka Creek. Still, Weoka Creek is a major tributary to Lake Jordan and while the monitoring sites are not directly on the lake, they are close by just to the northeast. Watersheds that have volunteer monitoring ongoing are Beeswax Creek, Cedar Creek, Walnut Creek, Lower Hatchet Creek, Cedar Creek, and Weoka Creek. Of the 20 watersheds in the Lower Coosa River Basin, 14 watersheds have no volunteer monitoring sites, leaving the great majority of the basin without current or ongoing water quality data.[6]

When compared to the water quality standards utilized by the Alabama Department of Environmental Management water use classification system, trend data from the 23 active volunteer monitoring sites in the Lower Coosa River Basin shows that water quality of all of the active monitoring locations are within range of ADEM's water quality standards for their individual use classifications, overall. See Figure 138. There have been, however, numerous instances throughout the basin when water quality did not meet the use standards, in what appears to be seasonal fluctuations. Low dissolved oxygen has been the most frequent occurrence of water quality not meeting the water use classification standards.[6]

Water temperature higher than 32° Celsius (90°Fahrenheit) was reported at six locations. In most instances, the increase in water temperature was an isolated event occurring during the summer months of June, July or August. Singular occurrences happened at Bouldin Reservoir and at Pennamotely Creek on Lake Mitchell. The other four locations experienced from one to three occurrences per year, all during the summer. At no location did the increased water temperature occur in more than two years over a monitoring span ranging from four to nine years. Three of the locations are on Lake Mitchell and one is on Lay Lake. The highest reported water temperature from all of the monitoring sites was 34°Celsius.[6]

In instances when pH was not within the water use classification standard parameters, it was most often high with a pH of nine. The deviation from the acceptable standards occurred at six monitoring locations, five of which were on Lake Mitchell and one was on Lay Lake. Of the six sites, four had isolated occurrences of high pH, however, each of these four site have a monitoring duration of one year or less or have experienced very erratic monitoring. A monitoring site on Pennamotely Creek (Lake Mitchell) experienced low pH of five in May 1999, ad a pH of nine in August 1999 and July 2002. This site has a nine-year monitoring history. A nearby site, on the south side of Cargile Creek at Lake Mitchell, experienced high pH, from 8.8 to 9, in 1998, 2001 and 2003. This site has a seven-year monitoring history.[6]

Figure 137:



Sources: Alabama Department of Environmental Management, August 2004. Alabama Water Watch. November 2004. www.alabamawaterwatch.org

Low dissolved oxygen has been reported at eight monitoring sites. Of these, two sites are on Lake Jordan, four sites are on Lake Mitchell and two sites are on Lay Lake. At three of the monitoring sites, two on Lake Mitchell and one on Lay Lake, the incidence of low dissolved oxygen occurred less than three times total. At the two Lake Jordan sites, low dissolved oxygen has been reported 11 times at one site and 15 times at the other site. All of the reports from both Lake Jordan sites occurred between June and October annually, but appear to be less frequent since 2001. Dissolved oxygen less than 3 mg/l was reported in June and September 1998, September 1999, and August 2000 at these sites. At the Lake Mitchell site on Byrd Creek, low dissolved oxygen reports ranged from 4 to 4.5 mg/l in August 1997, July 1998, March 1999, July and August 2001, June and August 2002, August 2003, and July 2004. At the Lake Mitchell site on Walnut Creek, dissolved oxygen was reported just under 5 mg/l in March and September 1997, September 1998, and April 2002. At the Lay Lake site on Dry Branch, dissolved oxygen ranged from 3.5 to 4.5 mg/l in June 2000, August 2001, September 2001, June through August 2002, and May 2003.[6]

No monitoring site has been reported with turbidity greater than 50 NTU, however, one site located on Lake Mitchell between Blue Creek and Cargile Creek did report turbidity of 50 on one occasion in March 1997. This site has a seven-year monitoring history. Of the four monitoring sites on Weoka Creek, none have reported any water quality data that is not within the water quality parameters established by the ADEM water use classification system.[6]

As of November 2004, volunteer bacteriological monitoring is only conducted at one site in the Lower Coosa River Basin, which is located on Lay Lake. Historically, there have been a total of 201 bacteriological sampling events at 52 monitoring sites in the basin. At the one active site on Lay Lake, bacteriological monitoring has been conducted since December 2001. E. coli has been reported on seven occasions. On five of those seven occasions, the E. coli colony count was less than 200 colonies per 100 mL of water, which is considered safe for frequent human contact. On two of the seven occasions in late 2002 and late 2003, however, the E. coli colony count was approximately 350 and 600 colonies per 100 mL of water, which is considered the maximum for infrequent human contact or a caution level.[6]

In the past, bacteriological monitoring has been conducted by volunteer monitors with the Lake Jordan HOBO, Lay Lake HOBO, Tri-River Water Watch and the Alabama Rivers Alliance. The Lake Jordan HOBO group has conducted 112 bacteriological sampling events at 17 sites between 1996 and 2000. There were a total of seven occurrences of E. coli counts greater than 200 colonies per 100 mL of water. Four of the seven occurrences were in a caution range between 200 and 600 colonies per 100 mL of water, of which three occurrences were on Lake Jordan (once in 1999 and twice in 2000) and one was on Sofkahatchee Creek in Elmore County in 1996. Three of the seven occurrences were in an unsafe for human contact range with counts of E. coli colonies exceeding 600 colonies per 100 mL of water. The monitoring sites at which these occurrences were reported in 1996 were located on Lake Jordan, Weoka Creek, and Little Weoka Creek.[6]

Figure 138:

Alabama Water Watch Volunteer Monitoring Data for Lower Coosa River Basin

Applicable Water Use Classification Standards				Water Temp		pH		DO		Turbidity		Dates
	Outstanding Alabama Water			Not >32C		6 – 8.5		Not <5.5 mg/l		Not >50 NTU		
	Public Water Supply			Not >32C		6 – 8.5		Not <5 mg/l		Not >50 NTU		
	Swimming			Not >32C		6 – 8.5		Not <5 mg/l		Not >50 NTU		
	Fish & Wildlife			Not >32C		6 – 8.5		Not <5 mg/l		Not >50 NTU		
	Agriculture & Industry			Not >32C		6 – 8.5		Not <3 mg/l		Not >50 NTU		
Waterbody	**Site Description**	**Use**	**AWW Site Code**	**Trend Range**	**Trend**	**Trend Range**	**Trend**	**Trend Range**	**Trend**	**Trend Range**	**Trend**	**Monitoring Span**
Lake Jordan	Bonner's Point	S	05008018	20.0 – 23.0	I	7.6	S	6.0 - 8.0	I	8.5 – 5.0	D	5/97 – 11/04
Lake Jordan	Mitchell's Dock	S	05008019	21.0	S	7.5 - 7.6	I	5.9 - 8.0	I	8.0 – 5.0	D	5/97 – 11/04
Bouldin Res	152 Lake Point Dr	PWS	05008031	18.0 – 22.0	I	7.6 - 7.5	D	9.2 – 8.0	D	14.9 – 15.2	S	12/01 – 11/04
Lake Mitchell	Pennamotely Cr	PWS	05011001	20.5 – 21.0	S	7.5 - 7.9	I	7.7 – 9.8	I	9.0 – 5.5	D	1/95 – 11/04
Lake Mitchell	Cargile Cr South	PWS	05011002	23.0 - 20.5	D	7.7	S	7.5 – 8.2	I	9.5 – 8.0	D	3/97 – 11/04
Lake Mitchell	Byrd Creek	PWS	05011004	23.0 – 21.0	D	7.7 - 7.8	I	7.5 – 6.0	D	9.5 – 5.0	D	3/97 – 11/04
Lake Mitchell	Cargile & Blue Cr	PWS	05011005	21.5 – 20.0	D	7.6	S	7.9	S	11.0 – 3.0	D	3/97 – 11/04
Lake Mitchell	Walnut Creek	F&W	05011006	23.0 – 16.0	D	7.9 - 6.9	D	8.0	S	15.0 – 20.0	I	3/97 – 11/04
Lake Mitchell	Weogufka Creek	S	05011012	20.0 – 23.0	I	7.2 - 7.5	I	7.0 – 7.5	I	8.5	S	5/00 – 11/04
Lake Mitchell	Blue Creek	F&W	05011013	25.0 - 24.8	D	8.1 - 7.9	D	7.5 – 9.2	I	8.0 – 7.5	D	6/01 – 9/04*
Lake Mitchell	Pennamotely Cr	F&W	05011016	16.5 – 31.0	I	7.5 - 8.1	I	10.5 – 6.8	D	21.0 – 17.0	D	2/04 – 10/04**
Lake Mitchell	Airplane Slough	PWS	05011017	14.0 - 31.0	I	7.9	S	12.0 – 5.0	D	12.0 – 7.0	D	2/04 – 10/04**
Lake Mitchell	Walnut Creek	F&W	05011018	18.0 – 24.0	I	6.7 - 7.6	I	9.0 – 7.5	D	4.0 – 20.0	I	2/04 – 11/04**
Lake Mitchell	Hatchet Creek	OAW	05011019	13.0 - 31.0	I	8 - 8.5	I	10. – 8.0	D	25.0 – 7.0	D	3/04 – 9/04**
Lake Mitchell	Finger Slough	PWS	05011020	23.5	S	8.2 - 7.4	D	8.0	S	9.0 – 7.0	D	3/04 – 11/04**
Lake Mitchell	CR 5	PWS	05011021	16.0 – 34.0	I	7.7 - 7.9	I	9.2 – 6.0	D	9.0 – 6.0	D	2/04 – 10/04**
Lay Lake	Dry Branch	PWS	05030005	18.5 - 22.0	I	7.3 - 7.5	I	7.0 – 7.5	I	18.0 – 15.0	D	9/99 – 11/04
Lay Lake	462 Blair's Place	PWS	05030009	21.0	S	7.7	S	8.9 – 9.5	I	13.0 – 12.0	D	9/00 – 11/04
Lay Lake	Jensen Dock	PWS	05030014	17.0 - 22.0	I	8.0 - 7.7	D	8.0	S	9.0 – 17.0	I	4/00 – 10/04*
UT to Weoka Cr	.1 m E of CR462	S	05041001	16.5 - 17.5	I	6.4 - 6.1	D	11.5 – 7.5	D	2.5	S	8/03 – 8/04**
UT to Weoka Cr	.25 m W of CR462	S	05041003	12.0 – 24.0	I	6.3 - 6.8	I	8.0 – 9.5	I	5.0 – 15.0	I	9/03 – 9/04**
Weoka Creek	1.25 m N CR428	S	05041004	14.0 - 18.0	I	7.0	S	8.0 – 8.5	I	18.0 – 20.0	I	9/03 – 5/04**
Weoka Creek	Bridge on CR 429	S	05041005	12.0 – 16.0	I	7.0 - 7.1	I	9.1 - 7.5	D	13.0 – 25.0	I	9/03 – 6/04**

I = Increasing Trend; D = Decreasing Trend; S = Stable Trend
Sample results did not meet water use standards one to three times. Sample results did not meet water use standards more than three times.
*Monitoring is too erratic to establish reliable trend line. **Due to short length of monitoring time span, trend line may be skewed.
Source: Alabama Water Watch Data Forum. November 2004. www.alabamawaterwatch.org

The Lay Lake HOBO has conducted 21 bacteriological sampling events at three sites between 2001 and 2004, resulting in three occurrences of E. coli counts between 200 and 600 colonies per 100 mL of water. All three occurrences were at sites located on Lay Lake, twice in 2002 and once in 2003.[6]

The Alabama Rivers Alliance has conducted 63 bacteriological sampling events at 30 sites in Coosa and Clay Counties focusing on the Hatchet Creek watersheds.[6] The Alabama Rivers Alliance used the bacteriological sampling, along with chemical water quality sampling, fish sampling and historical data to produce a report in April 2001, entitled *Hatchet Creek Ecological Baseline*. The Alabama Rivers Alliance considers Hatchet Creek to be a priority watershed for conservation efforts because of its extremely diverse native ecosystem. The Alabama Rivers Alliance sampling was conducted from September 1999 to March 2000[7]

In the Alabama Rivers Alliance sampling, there were a total of 15 occurrences of E. coli counts greater than 200 colonies per 100 mL of water. Eight of the 15 occurrences were in a caution range between 200 and 600 colonies per 100 mL of water and seven of the 15 occurrences were in an unsafe for human contact range with counts of E. coli colonies exceeding 600 colonies per 100 mL of water. Sites at which the highest E. coli counts were reported were (in decreasing order) Socapatoy Creek at 1,400; Matthew's Creek at 1,300; Topopkin Creek at 1,300; Swamp Creek at 1,250 and 1,050; Ray Creek at 1,100; and Bow Creek at 750 colonies per 100 mL of water. Monitoring sites where the E. Coli counts were between 200 and 600 included Swamp Creek, Gin Creek and Bow Creek.[6]

In the Hatchet Creek Ecological Baseline, the Alabama Rivers Alliance reported, "Recent fecal coliform measurements (1997-1999) indicated elevated levels on the lower reaches of Swamp Creek, Socapatoy Creek, and some smaller tributaries including Gin, Jacks, and Bow Creek. The sources of these high fecal coliform levels in unclear. Although three sites on Hatchet Creek had elevated fecal coliform levels, none exceeded the Outstanding Alabama Water standard for mean fecal coliforms.[7]

Source Documents

1. Alabama Department of Environmental Management, Field Operations Division. *ASSESS: ADEM's Strategy For Sampling Environmental Indicators of Water Quality Status*. April 1997.

2. US Geological Survey, Alabama Office of Water Resources. *Effects of Land Use on Water Quality and Biology of Streams in the Lower Coosa River Basin in Alabama*. By Will S. Mooty. May 2004.

3. Alabama Department of Environmental Management, Field Operations Division, Environmental Indicators Section. *Intensive Water Quality Survey of Coosa and Tallapoosa River Reservoirs, 1997.* March 24, 1999.

4. Alabama Department of Environmental Management, Field Operations Division, Aquatic Assessment Unit. *Surface Water Quality Screening Assessment of the Coosa River Basin – 2000.* April 1, 2002.

5. Auburn University Department of Fisheries and Allied Aquacultures. Alabama Water Watch. www.alabamawaterwatch.org December 2004.

6. Auburn University Department of Fisheries and Allied Aquacultures. Alabama Water Watch Data Forum. www.alabamawaterwatch.org December 2004.

7. Alabama Rivers Alliance. *Hatchet Creek Ecological Baseline.* By William W. Duncan, Bradford T. McLane, M. Beth Wentzel, Jessica L. Ulrich and Justin S. Ellis. April 2001.

Chapter 11
Impaired Waters and TMDLs

In simplest terms, an impaired body of water is one that has high levels of pollution from one or more sources, as identified through water quality studies, to the point that the water body can no longer sustain, or support, its classified use. Section 303(d) of the Clean Water Act establishes a process for states to identify waters where implementing technology-based controls (regulation of point sources) are inadequate to achieve water quality standards. In Alabama, this function is located within the Alabama Department of Environmental Management (ADEM), which submits a list of impaired waters to the Environmental Protection Agency (EPA) every two years.

ADEM utilizes five categories of criteria in listing or delisting water bodies on the Section 303(d) list which are conventional water quality parameters, toxicants, biological assessment data, fish consumption advisories and shellfish harvesting area closures. In each category, a water body is determined to either fully support, partially support or not support its designated use depending on the rate of incidence of violations of the criteria as shown in Figure 139.

Besides identifying water bodies that do not currently support their designated uses, each state is required to establish a priority ranking of these waters by taking into account the severity of the pollution and the designated uses of such waters. For each waterbody on the list, the state is required to establish a total maximum daily load (TMDL) for the pollutant or pollutants of concern at a level necessary to implement the applicable water quality standards. Guidance issued in August 1997, by the Environmental Protection Agency (EPA) suggests that states also include a schedule for TMDL development.[1] A TMDL identifies the amount of a specific pollutant or property of a pollutant, from point, nonpoint, and natural background sources, including a margin of safety, that may be discharged to a water body and still ensure that the water body attains water quality standards. The allocations of pollutant loadings to point sources are called wasteload allocations. Effluent limits in NPDES permits must be consistent with such wasteload allocations. Also, in the absence of a TMDL, permitting authorities still must assess the need for effluent limits based on water quality standards and, where necessary, develop appropriate wasteload allocations and effluent limits. This analysis could be done for an entire watershed or separately for each individual discharge.[2]

Information for this chapter of the Lower Coosa River Basin Management Plan is derived from ADEM reports including Alabama's 2004 Section 303(d) List, Alabama's Final 2004 Section 303(d) List Fact Sheet, Total Maximum Daily Load (TMDL) documents, and the Data Summary Report for the Coosa River Basin TMDLs prepared by Tetra Tech, Inc. of Atlanta, Georgia. Earlier versions of the Section 303(d) List and Fact Sheet, and the Section 305(b) Report have also been utilized for historical reference.

Figure 139:

Section 303(d) Listing and Delisting Criteria	
Conventional Water Quality Parameters (i.e., dissolved oxygen, temperature, pH)	
Fully Supporting	For any one pollutant or stressor, the criteria is exceeded in no more than 10 percent of the measurements.
Partially Supporting	For any one pollutant or stressor, the criteria is exceeded in 11 to 25 percent of the measurements.
Not Supporting	For any one pollutant or stressor, the criteria is exceeded in more than 25 percent of the measurements.
Toxicants (i.e., priority pollutants, metals, chlorine and ammonia)	
Fully Supporting	For any one pollutant, no more than one exceedance of acute or chronic criteria in a 3-year period based on ten or more samples.
Partially Supporting	For any one pollutant, acute or chronic criteria is exceeded more than once in a 3-year period but in less than 10 percent of the samples based on ten or more samples.
Not Supporting	For any one pollutant, acute or chronic criteria is exceeded in more than 10 percent of the samples based on ten or more samples.
Biological Assessment Data (i.e., macroinvertebrates)	
Fully Supporting	Macroinvertebrates determined to be in excellent condition (unimpaired), good condition (slightly impaired) or fair condition (moderately impaired) and chemical, physical and field data indicates compliance.
Partially Supporting	Macroinvertebrates determined to be in fair condition (moderately impaired) and chemical, physical, and field data indicates impairment.
Not Supporting	Macroinvertebrates determined to be in fair condition (moderately impaired) and chemical, physical and field data indicates impairment.
Fish Consumption Advisories (Alabama Department of Public Health - ADPH)	
Fully Supporting	ADPH has not issued a consumption advisory or has lifted a previous consumption advisory.
Partially Supporting	ADPH has issued a "Limited Consumption" advisory affecting only a subgroup of the population or restricting the quantity of fish that should be eaten.
Not Supporting	ADPH has issued a "No Consumption" advisory.
Shellfish Harvesting Area Closures (Alabama Department of Public Health)	
Fully Supporting	Shellfish harvesting areas were closed for no more than 10 percent of the reporting period of five years.
Partially Supporting	Shellfish harvesting areas were closed 11 to 24 percent of the reporting period of five years.
Not Supporting	Shellfish harvesting areas were closed 25 percent or more of the reporting period of five years.
Source: Alabama Department of Environmental Management. Watershed Management, 303(d) List. http://www.adem.state.al.us/WaterDivision/WQuality/303d/WQ303d.htm	

Impaired Waters in the Lower Coosa River Basin

Alabama's 2004 Section 303(d) List includes four water bodies in the Lower Coosa River Basin, which are an unnamed tributary to Dry Branch, Buxahatchee Creek, Lay Lake and Lake Mitchell. Each of these four water bodies was also listed on Alabama's Section 303(d) List in 1996, although there have been some modifications to the list over the 8-year period. A comparison of the lists is provided in Figure 140 and the four water bodies are highlighted on the map in Figure 141. Between 1996 and 2004, all of the impaired water bodies were upgraded to a partially-supporting status; the designated uses and priority rankings remained the same; the causes and sources of impairment were further refined; the size of the impaired areas was further defined, as were the beginning and end points of the impaired water bodies; and additional and more recent data was utilized. A discussion of each of the impaired water bodies follows.

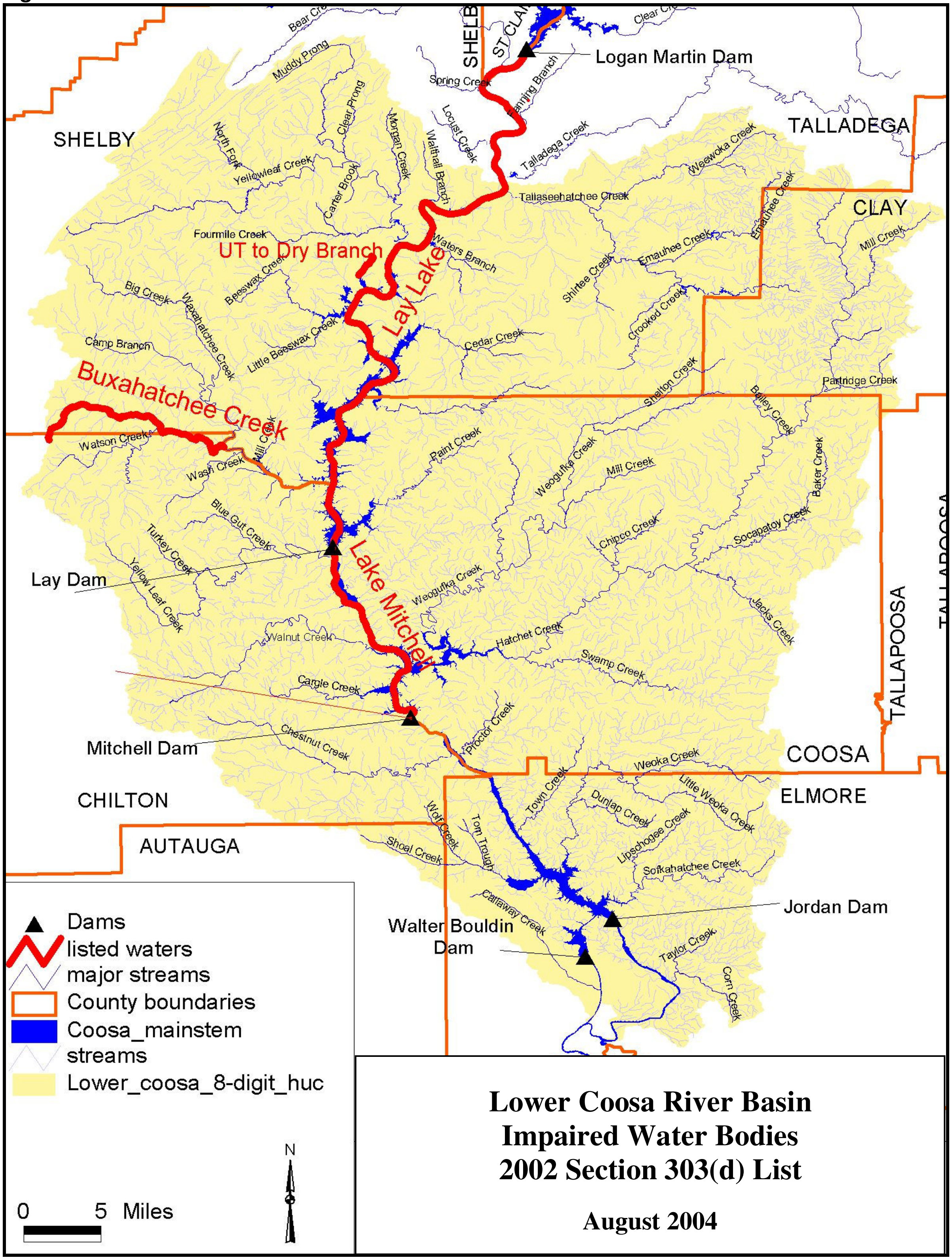
Figure 140:

Lower Coosa River Basin Impaired Waters Comparison, 1996 and 2004

Name	Support Status	Rank	Use	Causes	Sources	Size	From	To	Date of Data
1996 Section 303(d) List									
Unnamed Trib to Dry Branch	Non	H	F&W	Nutrients, OE/DO	Municipal	2.0 miles	Dry Br	Wilsonville WWTP	1991
Buxahatchee Creek	Non	H	F&W	Nutrients, OE/DO	Municipal, Natural	10.0 miles	Waxahatchee Creek	Calera WWTP	1991
Lay Lake	Partial	L	PWS S F&W	Priority Organics, Nutrients, OE/DO	Flow Regulation & Modification	12,000 acres	---	---	1990 1991
Lake Mitchell	Partial	L	PWS S F&W	Nutrients, OE/DO	Surface Runoff, Flow Regulation & Modification	5,850 acres	---	---	1991 1992 1993
2004 Section 303(d) List									
Unnamed Trib to Dry Branch	Partial	H	F&W	Nutrients	Municipal, Urban Runoff/ Storm Sewers	1.5 miles	Dry Br	Its Source	1991
Buxahatchee Creek	Partial	H	F&W	Nutrients	Municipal, Urban Runoff Storm Sewer	14.0 miles	Waxahatchee Creek	Its Source	1988 1996
Lay Lake	Partial	L	PWS S F&W	Priority Organics (PCBs), Nutrients, OE/DO	Flow Regulation & Modification, Contaminated Sediments, Upstream Sources	11,765 acres	Lay Dam	Southern RR Bridge	1990 - 1991 1992 - 1997
Lay Lake	Partial	L	S F&W	Priority Organics (PCBs), Nutrients, OE/DO	Flow Regulation & Modification, Contaminated Sediments, Upstream Sources	875 acres	Southern RR Bridge	River Mile 89	1990 - 1991 1992 - 1997
Lake Mitchell	Partial	L	PWS S F&W	Nutrients	Flow Regulation & Modification, Urban Runoff/ Storm Sewers	5,850 acres	Mitchell Dam	Lay Dam	1991 - 1993 1994 - 1997

Source: Alabama Department of Environmental Management. www.adem.state.al.us

Figure 141:



Source: Alabama Department of Environmental Management. August 2004.

Unnamed Tributary to Dry Branch. At this time, there is limited data available about the impairments to the unnamed tributary to Dry Branch, which is located in Shelby County in the Beeswax Creek watershed. Originally listed in 1996 for nutrients and organic enrichment/low dissolved oxygen, the cause of the impairments was modified to just nutrients by 2002. The tributary is located downstream from the Wilsonville Wastewater Treatment Plant, which may be a contributing factor to the nutrient level in the stream. Animal concentrations in the Beeswax Creek watershed are low; however, this watershed has the highest density of septic systems in the Lower Coosa River Basin, at .08 tanks per acre or 12 acres per septic system. The high septic system density could also be a contributing factor to the nutrient impairment. Dry Branch has been monitored by an Alabama Water Watch volunteer monitor since 1999, with reports of low dissolved oxygen in more than three monitoring events.

By 2002, the causes of the impairments had been modified from just municipal sources to municipal sources and urban runoff/storm sewers. The 2000 Surface Water Quality Screening Assessment reported that the Beeswax Creek watershed has a high potential for impairment due to sedimentation. And, the 1999 Basin Assessment conducted by the Alabama Soil and Water Conservation Committee reported that the Beeswax Creek watershed has the second highest annual sediment production in the basin, at 736,927 tons annually, with 83 percent of the sediment in the watershed produced by developing urban lands.

Buxahatchee Creek. Buxahatchee Creek was initially placed on Alabama's 303(d) list of impaired waterbodies in 1992, the first year the list was published by ADEM. There were two listed causes of impairment: organic enrichment/low dissolved oxygen and nutrients. Data supporting these listings came from ADEM's 1988 and 1991 Clean Water Strategy (CWS) Reports. The TMDL for organic enrichment and dissolved oxygen was developed by ADEM in 1996 and approved by EPA in 1997.

In 1996, the impaired portion of Buxahatchee Creek was listed as 10 miles, but was extended to 13 miles by 2002 and extended again in 2004 to include 14 miles from the confluence with Waxahatchee Creek to the source of Buxahatchee Creek. The majority of Buxahatchee Creek is located in Shelby County with the confluence with Waxahatchee Creek located in northern Chilton County. A larger portion of the total drainage area of 70 square miles, however, is located in Chilton County. The drainage area includes one municipal wastewater treatment plant and five industrial wastewater treatment plants, according to maps provided by ADEM. In 1996, the impairment was listed as nutrients and organic enrichment/dissolved oxygen from municipal point sources and natural sources. With the development and approval of the organic enrichment/dissolved oxygen TMDL in 1996, the impairment was modified to just nutrients from municipal point sources and urban runoff and storm sewer nonpoint sources by 2002.

Buxahatchee Creek is primarily impaired by a total phosphorous overload coming from the Calera wastewater treatment plant. Technically this is documented as organic enrichment (nutrients) and low dissolved oxygen. The problem is caused because the upgrade of the Calera wastewater treatment plant from 0.75 million gallons per day to 1.5 million gallons per day is approximately one year behind. When the upgrade is completed the excess organic material, basically human waste, will be removed. The City of Calera has also been attempting to reduce a foul odor that has developed in the stream. The odors are likely to be due to anaerobic decomposition (decomposition of organic material combined with low dissolved oxygen conditions) releasing hydrogen sulfide and carbon dioxide bubbles that float sediments to the surface. When the treatment plant expansion is complete the organic material content should be decreased and the dissolved oxygen level increased. While this should stop the formation of new anaerobic sediments, the benthic sediments in the stream may continue to be a problem. The future treatment after the plant expansion is completed should be considered as an "unknown." In this manner, additional courses of action can be determined based on the results achieved after the plant is in operation.

Although the Calera wastewater treatment plant is considered to be the primary source of impairment of the Buxahatchee Creek, other possible sources of impairment include failing septic systems, agricultural runoff, runoff from a golf course just east of Interstate 65 and urban runoff from the conversion of former agricultural and forest land to residential land uses.[3]

Lay Lake and Lake Mitchell. Initially included on Alabama's first Section 303(d) list in 1992, Lay Lake was also included on the 1996 Section 303(d) with priority organics, nutrients and organic enrichment/dissolved oxygen as the causes of impairment due to flow regulation and modification of the Coosa River. Lake Mitchell was added to the Section 303(d) list in 1996 with nutrients and organic enrichment/dissolved oxygen as the causes of impairment from surface runoff and flow regulation and modification of the Coosa River, as with Lay Lake. Both lakes remained on the 2002 Section 303(d) list, however, the list was modified to include contaminated sediments and upstream sources as sources of impairment for Lay Lake. On the 2004 Section 303(d) list, the cause and sources of impairments for Lay Lake remained the same, however, Lay Lake was divided into two segments for listing due to differing use classifications. The lower part of the lake, below the Southern Railroad Bridge, is designated for use as a public water supply, while the upper part of the lake is designated for swimming and fish and wildlife. Lake Mitchell, however, was delisted in 2004 for the impairment due to organic enrichment/ dissolved oxygen. Analysis of later sampling data gathered between 1995 and 2000 by ADEM and the Alabama Power Company showed that the water in Lake Mitchell does not violate the dissolved oxygen criteria more than 10 percent of the times that the sites were sampled.[4] As of the 2004, Lake Mitchell and both segments of Lay Lake were identified as partially supporting their designated uses.

The priority organics impairment of Lay Lake is related to the presence of polychlorinated biphenyls (PCBs), which resulted in Lay Lake being placed on the Alabama Department of Public Health Fish Consumption Advisory List in 1992. Although upper portions of Lay Lake remain on the Fish Consumption Advisory List, no portion of the lake which lies in the Lower Coosa River Basin has been included on the Fish Consumption Advisory List since 2002. There are no known direct sources of PCBs to Lay Lake, however, two sources have been identified as contributing historical releases of PCBs to the lake: the Solutia facility (formerly Monsanto) and the General Electric facility in Rome, Georgia.[5]

Both Lay Lake and Lake Mitchell are impaired from nutrients and Lay Lake remains impaired by organic enrichment and low dissolved oxygen. The Section 303(d) listing of the lakes is based on the trophic status of each lake as reported in Alabama's 305(b) reports. ADEM identified organic enrichment and nutrient loads as the potential causes of low dissolved oxygen observed at the Coosa River lakes. Nitrogen and phosphorus, in the presence of ample sunlight, support the growth of algae in a lake. Over time, the growth and decay of algae contribute organic material to the system. As this material decomposes, oxygen is consumed and nutrients stored in the biomass are released and used to support additional algal growth. In an unimpaired system, this cycle is fairly stable and oxygen levels remain high enough to support other life forms in the lake. Excessive nutrient loads that lead to algal blooms, however, disturb the equilibrium, and can cause oxygen concentrations to drop below 5 mg/L. As a general rule, oxygen concentrations below this level are stressful to aquatic organisms.[6]

Nutrient impairment in the lakes is based on levels of Chlorophyll *a* as the primary indicator of algal biomass. Chlorophyll *a* is a pigment used by most plants during photosynthesis, and is therefore present in most species of algae. Each cell contains pigment, so high Chlorophyll *a* concentrations observed in a lake indicate high amounts of algae in the water. Algal blooms are often associated with excess concentrations of nitrogen and/or phosphorus.[6]

Both point and nonpoint sources may contribute to organic enrichment within a given waterbody. The major sources of organic enrichment from nonpoint sources within the Coosa River watershed are nutrients and organic material from agricultural and urban lands and direct discharge into streams due to cattle. Other nonpoint source contributions could be failing septic systems and urban runoff. Compared to other land uses, organic enrichment from forested land is normally considered to be minimal. This is because forested land tends to serve as a filter of pollution originating within its drainage areas. Major point sources located in the Lower Coosa River Basin that discharge into the lakes include the Clanton Walnut Creek Wastewater Treatment Plant, Bowater Alabama, Inc., and the Alabama Power Gaston Steam Plant.[6]

Lower Coosa River Basin TMDLs

With the exception of the unnamed tributary to Dry Branch, draft total maximum daily loads for the Lower Coosa River Basin were developed in 2003 and were made available for public comment between November 1, 2003 and January 31, 2004. Following the public comment period, the TMDLs for the Coosa River Basin were refined and sent to the Environmental Protection Agency for approval. As of the production of this Plan, ADEM is still waiting approval of the TMDLs from EPA. A nutrient TMDL for Weiss Lake in the Upper Coosa River Basin, which was developed in 2000 and finalized by EPA in November 2004, is the only approved TMDL in the entire Coosa River Basin at this point. The TMDL for the unnamed tributary to Dry Branch is scheduled for development by 2007.

Buxahatchee Creek. The 2003 TMDL for Buxahatchee Creek addresses the second cause of impairment in the stream, which is nutrients. The State of Alabama currently has no numeric criteria for nutrients in streams. However, Alabama employs narrative criteria termed "Minimum Conditions Applicable to All State Waters" which are applicable to all streams in Alabama, which state that State waters shall be (a) free from substances attributable to sewage, industrial wastes or other wastes that will settle to form bottom deposits which are unsightly, putrescent or interfere directly or indirectly with any classified water use; (b) free from floating debris, oil, scum, and other floating materials attributable to sewage, industrial wastes or other wastes in amounts sufficient to be unsightly or interfere directly or indirectly with any classified water use; and (c) free from substances attributable to sewage, industrial wastes or other wastes in concentrations or combinations, which are toxic or harmful to human, animal or aquatic life to the extent commensurate with the designated usage of such waters.[3]

In developing the nutrient TMDL, total phosphorus (TP) was chosen as the nutrient target due to the effluent discharged into the stream and the target for total phosphorus was calculated to be 0.058 mg/L based on ecoreference station data. Through computer modeling of three water quality scenarios, it was determined that a load reduction of 90 percent is necessary to attain the total phosphorus target. Of the total TP load allocation that will be allowed to enter the stream, 97 percent was allocated to the Calera Wastewater Treatment Plant (WWTP) and 3 percent was allocated to nonpoint sources. Currently, the Calera WWTP discharges approximately 2.63 pounds of total phosphorus per day into Buxahatchee Creek. Under the proposed TMDL, the discharge of total phosphorus from the Calera WWTP will have to be reduced to 0.36 pounds per day with the current 0.75 million gallons per day operating capacity and will be limited to 0.72 pounds per day following the completion of the WWTP operating capacity upgrade to 1.5 million gallons per day. It is estimated that total phosphorus in the stream from nonpoint sources is currently 0.08 pounds per day, which will have to be reduced to 0.07 pounds per day to meet the 90 percent reduction requirement of the proposed TMDL.[3]

Establishment of a total phosphorus target for Buxahatchee Creek that is fully protective of its designated uses is typically only the beginning of a lengthy and complex process of TMDL development and implementation. Buxahatchee Creek has the been subject of several investigations and studies over the last five years and many unknowns still exist regarding the cause and effect relationships between nutrient loading and its effects on flora and fauna. ADEM believes the issues encountered with the development and implementation of nutrient TMDLs for Buxahatchee Creek are well suited for an adaptive management process. Adaptive management will provide a flexible means to restoring Buxahatchee Creek, while allowing time to answer the questions that remain regarding the cause and effect relationships. Adaptive management ultimately allows for remedial actions to be initiated before answering all the unknowns. Therefore, unnecessary delays in restoring the creek are avoided.[3]

Lay Lake Priority Organics Decision. As noted earlier, the sources of PCBs in Lay Lake have been identified as coming from point sources upstream of the lake. These source problem areas are being addressed in a Decision Document for PCBs in Choccolocco Creek proposed by ADEM in 2003 and a TMDL for PCBs in Weiss Lake proposed by EPA in 2003. Therefore, ADEM, in conjunction with EPA Region 4, has determined that a TMDL for PCBs in Lay Lake is not necessary at this time.[5] Other than leaving the priority organic material alone, other methods to address the existing PCBs in Lay Lake include either dredging the material and disposing of it in another location or by another method, or seal the priority organic material in place. Since the PCBs entered the lake several years ago, the natural sedimentation process in the reservoir has effectively sealed the PCBs in place under a substantial depth of water. Therefore, the best treatment is to leave the material in place. This is preferred to disturbing the material by dredging and risking moving exposed contaminants further downstream.

Lake Mitchell and Lay Lake Nutrient TMDL. In December 2002, EPA Region 4 reproposed the nutrient TMDL for Weiss Lake which called for a 33 percent reduction of total phosphorus at the Georgia state line to meet ADEM's chlorophyll a criterion of 20 ug/l (growing season mean). TMDL modeling results run with the implementation of the Weiss Lake reduction of total phosphorus in place, show that Lay Lake and Lake Mitchell should be fully supporting for nutrients and organic enrichment/dissolved oxygen at some time after the 33 percent reduction of total phosphorus at Weiss Lake is implemented.[6] This will address nutrient loading at the source and stop the effect from being discharged downstream from reservoir to reservoir.

Lay Lake Organic Enrichment/Dissolved Oxygen TMDL. To ensure that Lay Lake remains fully supporting of its designated use in critical conditions, in addition to the total phosphorus reduction at Weiss Lake, TMDL models determined that a load reduction in biochemical oxygen demand (BOD_5) from the paper mill facility that discharges into Lay Lake is necessary. Therefore, the TMDL requires that Bowater must reduce its permitted monthly average BOD_5 load during June through September to 16,000 pounds per day, representing a load reduction of 36 percent.[6]

Source Documents

1. Alabama Department of Environmental Management. *2004 Integrated Water Quality Monitoring and Assessment Report* (CWA Section 305(b) Report). Appendix E: Alabama's Final 2004 Section 303(d) List Fact Sheet. http://www.adem.state.al.us/WaterDivision/WQuality/305b/WQ305bReport.htm

2. Environmental Protection Agency. *Nonpoint Source Pointers* (Fact Sheets). http://www.epa.gov/owow/nps/facts/

3. Alabama Department of Environmental Management. *Draft Total Maximum Daily Load for Buxahatachee Creek, AL/03150107-090_01: Nutrients.* October 2003.

4. Alabama Department of Environmental Management. *Draft Delisting Decision for Lake Mitchell, Waterbody ID# AL/Mitchell Res_01: Organic Enrichment/Dissolved Oxygen (OE/DO).* October 2003.

5. Alabama Department of Environmental Management. *Draft Decision Document for Lay Lake, Waterbody ID# AL/Lay Res_01: Priority Organics (PCBs).* October 2003.

6. Alabama Department of Environmental Management. *Draft Total Maximum Daily Load for Lake Neely Henry (AL/Neely Henry Res_01): Nutrients; Logan Martin Lake (AL/Logan Martin(AL/Logan Martin Res_01): Nutrients & OE/DO; Lay Lake (AL/LayRes_01): Nutrients &OE/DO): Nutrients and &OE/DO; Lake Mitchell (AL/Mitchell Res_01): Nutrients.* October 2003.

Part III
Water Quality Improvement Program

Chapter 12
Priority Watersheds

Each of the watersheds of the Lower Coosa River Basin has been organized into one of three categories (high, moderate or low priority) based on their score results upon application of an 18-factor rating system. Those watersheds categorized as a high priority watersheds have the greatest number of features that could have a negative impact on water quality within the watershed, such as a significant amount of urban land uses, and/or the highest number of features to be safeguarded, such as endangered species. Conversely, those watersheds categorized as a low priority watersheds have the fewest features with potential for negative impacts on water quality or the fewest features to be safeguarded. Even in the low priority watersheds, factors do exist which may impact water quality in a negative manner if not managed correctly. Therefore, the low priority watersheds are in just as much need of watershed management measures as the high priority watersheds, though the urgency may not be as great.

The organizational technique used provides a basis for determining which issues have the potential to impact the entire basin, as well as identifying issues which may be impacting some, but not all, of the watersheds – regional issues. The priority rating system utilized 18 factors drawn from the existing physical, structural, economic and cultural features of the watershed, as well as from the identification of characteristics that need to be safeguarded, i.e., sensitive features.

In addition to the existing conditions that have been previously outlined and defined in this plan, rating factors from two other studies were used as well: the (SWCD) Watershed Assessments conducted in 1999 and the Alabama Department of Environmental Management *Surface Water Quality Screening Assessment of the Coosa River Basin – 2000 (Screening Assessment).* The rating system included in this plan does not always match the individual watershed ranking of the other studies. The SWCD Watershed Assessments were conducted on a county by county basis, with some watersheds in the county lying in different river basins. The individual SWCD Watershed Assessments designated Priority 1 and Priority 2 watersheds for each county, regardless of which river basin the watershed was located within. This provides a good tool for the counties, but does not provide an adequate perspective for the entire Lower Coosa River Basin. The *Screening Assessment* identified watersheds as high, moderate and low potential based on their potential for nonpoint source pollution. While the *Screening Assessment* provides an excellent resource for identification of the factors contributing to nonpoint source pollution, it does not consider other factors, such as endangered species or the capacity of the residents of the watershed to resolve local water quality issues. The ranking system provided in this plan provides a holistic perspective of the individual watersheds within the setting of the Lower Coosa River Basin, including the economic and cultural assets and limitations, and accounts for the presence of sensitive features that need to be safeguarded in the watershed management process. In this way, the Lower Coosa River Basin 2005 Priority Watersheds ranking system is more inclusive than previous studies, while recognizing their contributions in the rating factors.

For each rating factor, a watershed received a score between one and five, with one having the least potential for a negative impact on water quality or lowest presence of sensitive features and five having the highest potential for a negative impact on water quality or a more significant presence of sensitive features. The scores were then added for the final rating score, ranking the watersheds as high, moderate or low priority. High priority watersheds received a rating score of 60 or higher; moderate priority watersheds a rating score between 50 and 59; and, low priority watersheds a rating score of 49 or lower. The ranking resulted in six low priority watersheds, three moderate priority watersheds and eleven high priority watersheds. Figure 142 shows that the location of the high priority watersheds is strongly aligned across the northern, western and southern parts of the basin, while the low and moderate priority watersheds are found in the east central portion of the basin. This pattern reflects the urbanization patterns west of the Coosa River and the presence of the Talladega National Forest and lower population densities east of the Coosa River. The factors used in the watershed rating are provided in Figure 143 and a summary chart is provided in Figure 144.

Figure 142:

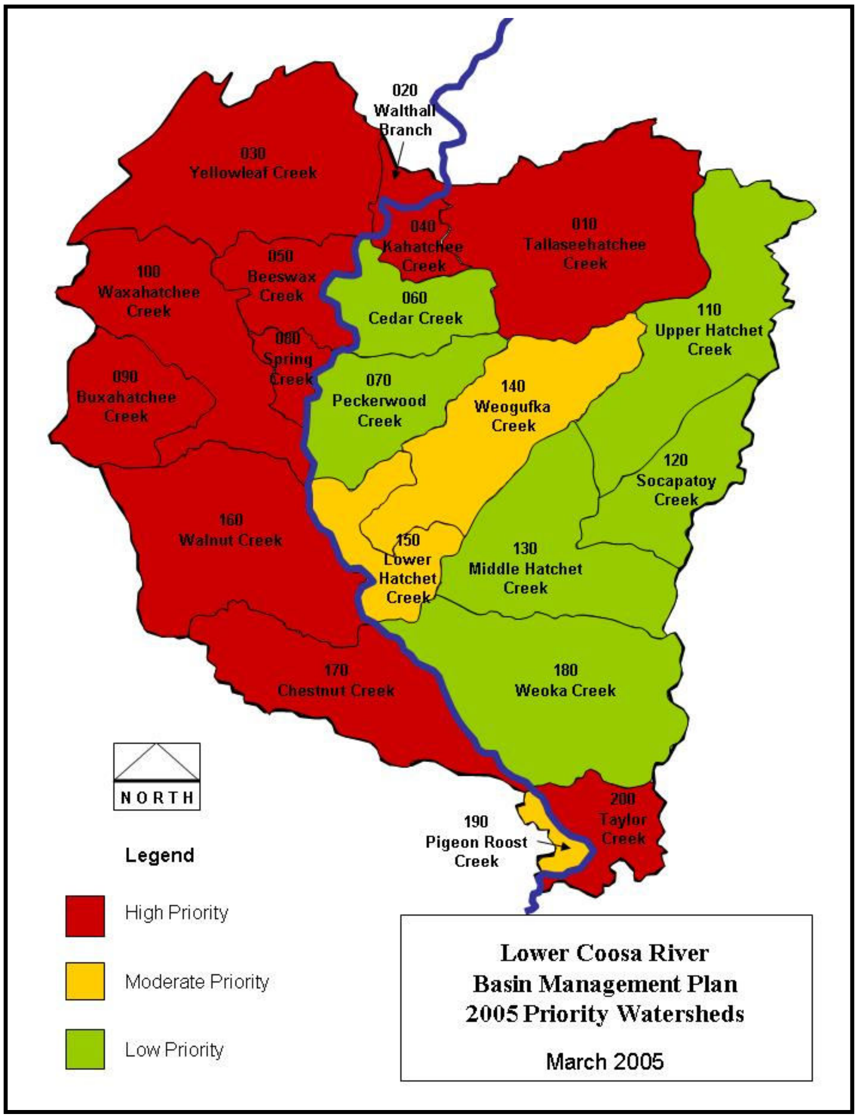


Figure 143:

Rating Factors of the Watershed Ranking System *(Worksheets for those factors that are ratios are located in Appendix D.)*	
Rating Factor	**Description**
Impaired Water Bodies	The presence of a water body that was included in the State of Alabama 2004 Draft Section 303(d) List of Impaired Water Bodies resulted in a score of 5 for the watershed. If an impaired water body was not present, then a score of 1 was given to the watershed.
ADEM Assessment Rating for NPS	Those watersheds that have a high or moderate potential for nonpoint source pollution, as noted in the ADEM *Surface Water Quality Screening Assessment of the Coosa River Basin – 2000* were assigned a score of 3 for moderate potential or 5 for high potential. If the watershed was not designated in the study as having a high or moderate potential for nonpoint source pollution, it received a score of 1.
NRCS Priority Watershed	Those watersheds designated as Priority 1 watersheds in the NRCS 1999 Watershed Assessments received a score of 5, while those watersheds that were Priority 2 watersheds received a score of 3. If the watershed was not designated as a Priority 1 or Priority 2 watershed, it received a score of 1.
Alabama Water Watch Citizen Water Quality Monitoring and Results	The presence or lack of presence of local citizen water quality monitoring activities was accounted for through the database available on the Alabama Water Watch website. Through citizen monitoring it is possible to establish water quality trend lines and to identify potential water quality problems early. Those watersheds with no monitoring activities received a score of 5. If on-going citizen monitoring is present in the watershed, then monitoring results from the AWW website were used to determine the rating score as follows: Results did not meet parameter standards in more than three events = 5 Results did not meet parameter standards in less than three events = 3 Results met all parameter standards in all monitoring events = 1
Use Classification	The water use classification, as designated by ADEM, was taken into account to ensure that those watersheds that contain water bodies where more stringent water quality standards apply will continue to meet their applicable standards. Scoring factors are as follows: Outstanding Alabama Water, Public Water Supply or Swimming = 5 Shellfish Harvesting = 4 Fish and Wildlife = 3 Limited Warm Water Fishery = 2 Agricultural and Industrial Water Supply = 1
Land Use Character	The predominant land use of the watershed was noted with urban land uses, which have the most negative effect on water quality, receiving a score of 5; agricultural land uses receiving a score of 3, and forest land uses receiving a score of 1.
Potential for Silviculture	While undisturbed forest land uses have the least impact on water quality, silviculture activities in these forested areas do have significant potential for nonpoint source pollution if best management practices are not implemented. The potential for silvicultural activities was based on the percentage of evergreen forest of the total forested land in the watershed. Scoring factors are as follows: 32.01 or More Percent Evergreen = 5 24.01 to 32.00 Percent Evergreen = 4 16.01 to 24.00 Percent Evergreen = 3 8.01 to 16.00 Percent Evergreen = 2 0 to 8 Percent Evergreen = 1

Figure 143, Continued:

Rating Factor	Description
Sediment Load Ratio	The NRCS 1999 Watershed Assessments provide the total sediment generated in each watershed by source. This factor applies a ratio of the amount of total sediment generated by the total acreage of the watershed. Ratios range between 0.96 tons per acre and 27.50 tons per acre. Scoring factors are as follows: 10.01 or More Tons Per Acre = 5 6.01 to 10.00 Tons Per Acre = 4 4.01 to 6.00 Tons Per Acre = 3 2.01 to 4.00 Tons Per Acre = 2 0 to 2.00 Tons Per Acre = 1
Animal Density	Although there are no CAFOs present in the Basin, some watersheds have a higher quantity of cattle, swine and poultry than others. The NRCS 1999 Watershed Assessments provide the total number of animals by type present in each watershed. Scores are based on a ratio of the number of animals to the size of the watershed (in acres). The animal density ratio ranged between 0 and 111.64 acres per animal. 0 to 15 Acres Per Animal = 5 16 to 30 Acres Per Animal = 4 31 to 45 Acres Per Animal = 3 46 to 60 Acres Per Animal = 2 60 Acres of More Per Animal = 1
Soil Suitability for Development	Without proper management measures, development in areas with poor soil composition increases the potential for erosion and sedimentation. Watersheds with soils that are not conducive to structural development received a score of 5, while those watersheds with soils that are conducive to development received a score of 1. Watersheds with a combination of soils received a score of 2, 3 or 4 depending on the majority of the soil type.
Growth Rate of County	Population information available from the U.S. Bureau of the Census was used to identify those counties with the highest population increases from 1990 to 2000. The population increase was important to account for the increased urbanization of the land to accommodate the population growth. Population increases in the Basin ranged from 7.6 percent to 44.2 percent. Watersheds received scores based on the county within which the majority of the watershed is located. Population increase from 41 to 50 percent = 5 Population increase from 31 to 40 percent = 4 Population increase from 21 to 30 percent = 3 Population increase from 11 to 20 percent = 2 Population increase from 0 to 10 percent = 1
Increase in Traffic Volume	Increased vehicular traffic presents more potential for nonpoint source pollution from roadways. Even watersheds that do not show an increase in population can be negatively affected by a traffic increase from vehicles en route to another destination. Changes in traffic volume ranged from a decrease of 37.01 percent to an increase of 63.34 percent. For those watersheds with more than roadway present, the highest increase was used as the basis for the score. Traffic volume increase of 45 percent or more = 5 Traffic volume increase from 30.00 to 44.99 percent = 4 Traffic volume increase from 15.00 to 29.99 percent = 3 Traffic volume increase from 0 to 14.99 percent = 2 A decrease in traffic volume = 1

Figure 143, Continued:

Number of Permitted Dischargers	NPDES permitted discharger information from ADEM was used to identify the number of point source discharges per watershed. The number of point source discharges can affect the amount of nonpoint source pollution that a water body can assimilate. The number of permitted dischargers in a watershed ranged from 0 to 42. 31 or more dischargers = 5 21 to 30 permitted dischargers = 4 11 to 20 permitted dischargers = 3 1 to 10 permitted dischargers = 2 No permitted dischargers = 1
Presence of Hydroelectric Dam	The presence of a hydroelectric dam presents issues that can have a negative impact on water quality, some of which may include thermal stress, pooling, flow interruption, dissolved oxygen issues and bank erosion. Watersheds located upstream and downstream of a hydroelectric dam received a score of 5. Watersheds without a hydroelectric dam present received a score of 1.
Housing Density	Housing density was calculated by dividing the number of houses present in the watershed (using 2000 Census data) by the acreage, or area, of the watershed. This ratio was used as opposed to the number of housing units to indicate a higher potential for nonpoint source pollution due to the concentration of population. Housing density ranged from 8.69 acres per unit to 140.23 acre per unit. 0 to 30 Acres Per Unit = 5 31 to 60 Acres Per Unit = 4 61 to 90 Acres Per Unit = 3 91 to 120 Acres Per Unit = 2 121 o 150 Acres Per Unit = 1
Septic System Density	The SWCD 1999 Watershed Assessments provide the total number of septic systems located in each watershed. The density of septic systems was used rather than the number of systems in the watershed. This ratio indicates the potential for nonpoint source pollution due to the concentration of septic systems, particularly in smaller watersheds. 0 to 30 Acres Per Unit = 5 31 to 60 Acres Per Unit = 4 61 to 90 Acres Per Unit = 3 91 to 120 Acres Per Unit = 2 121 o 150 Acres Per Unit = 1
Number of Endangered Species	The number of endangered species indicates a higher need for management measures to ensure that these species are offered continued survival without habitat disturbance. 41 and 50 endangered species = 5 31 to 40 endangered species = 4 21 to 30 endangered species = 3 11 to 20 endangered species = 2 0 to 10 endangered species = 1
2000 Unemployment Rate	The unemployment rate of the watershed, based on 2000 Census, is an indicator of the economic capacity of residents to implement watershed management measures. Unemployment rates between 8.01 and 10.00 percent = 5 Unemployment rates between 6.01 and 8.00 percent = 4 Unemployment rates between 4.01 and 6.00 = 3 Unemployment rates between 2.01 and 4.00 percent = 2 Unemployment rates between 0 and 2.00 percent = 1

Figure 144:

Lower Coosa River Basin Management Plan 2005 Priority Watershed Rating

Rating Factor	010 Tallassehatchee Creek	020 Walthall Branch	030 Yellowleaf Creek	040 Kahatchee Creek	050 Beeswax Creek	060 Cedar Creek	070 Peckerwood Creek	080 Spring Creek	090 Buxahatchee Creek	100 Waxahatchee Creek
Impaired Water Bodies	1	5	1	5	5	5	5	5	5	5
ADEM Assessment Rating for NPS	5	5	1	5	5	5	1	1	1	1
SWCD Priority Watershed	3	1	1	1	3	1	3	1	1	1
Alabama Water Watch Citizen Water Quality Monitoring and Results	5	5	5	5	5	3	5	5	5	5
Use Classification	5	3	5	3	1	1	1	1	3	3
Land Use Character	5	3	4	5	5	3	1	5	1	1
Potential for Silviculture	3	5	4	4	4	4	4	5	5	4
Sediment Load Ratio	2	5	3	5	5	3	1	5	4	4
Animal Density	4	5	3	4	4	3	1	4	3	3
Soil Suitability for Development	2	1	4	5	3	2	4	3	4	5
Growth Rate of County	2	5	5	2	5	2	2	5	3	5
Increase in Traffic Volume	4	3	5	1	3	1	1	3	5	4
Number of Permitted Dischargers	5	1	4	2	2	2	1	2	2	4
Presence of Hydroelectric Dam	1	1	1	1	1	1	5	1	1	5
Housing Density	5	5	5	5	5	5	2	5	5	4
Septic System Density	1	5	5	1	5	1	4	5	5	5
Number of Endangered Species	4	4	4	4	4	4	4	4	4	5
2000 Unemployment Rate	5	3	2	5	3	3	4	5	3	3
Total	**62**	**65**	**62**	**63**	**68**	**49**	**49**	**65**	**60**	**67**

Figure 144, Continued:

Lower Coosa River Basin Management Plan 2005 Priority Watersheds

Rating Factor	110 Upper Hatchet Creek	120 Socapatoy Creek	130 Middle Hatchet Creek	140 Weogufka Creek	150 Lower Hatchet Creek	160 Walnut Creek	170 Chestnut Creek	180 Weoka Creek	190 Pigeon Roost Creek	200 Taylor Creek
Impaired Water Bodies	1	1	1	1	5	5	1	1	1	1
ADEM Assessment Rating for NPS	1	1	1	1	1	1	1	1	1	5
NRCS Priority Watershed	1	1	1	5	1	5	3	1	1	1
Alabama Water Watch Citizen Water Quality Monitoring and Results	5	5	5	3	3	5	5	1	5	5
Use Classification	5	3	5	5	5	3	3	5	5	5
Land Use Character	1	1	1	2	1	3	4	1	5	5
Potential for Silviculture	2	3	3	3	5	3	3	3	1	4
Sediment Load Ratio	1	1	1	1	1	2	2	1	2	5
Animal Density	1	1	1	3	1	5	2	1	1	1
Soil Suitability for Development	4	3	3	5	5	3	4	3	2	2
Growth Rate of County	1	2	2	2	2	3	3	4	4	4
Increase in Traffic Volume	3	3	2	3	1	3	5	2	5	2
Number of Permitted Dischargers	2	2	2	2	1	4	2	2	2	2
Presence of Hydroelectric Dam	1	1	1	1	5	5	5	5	5	5
Housing Density	3	3	2	4	1	5	5	4	5	5
Septic System Density	5	5	5	5	4	5	5	5	1	1
Number of Endangered Species	4	4	4	4	4	4	5	4	5	5
2000 Unemployment Rate	5	4	3	3	5	3	3	2	5	3
Total	**46**	**44**	**43**	**53**	**51**	**67**	**61**	**46**	**56**	**61**

High Priority Watersheds

The eleven watersheds receiving the high priority ranking in the Lower Coosa River Basin, in order of highest rating score, are: Beeswax Creek watershed (68); Walnut Creek watershed (67); Waxahatchee Creek watershed (67); Spring Creek watershed (65); Walthall Branch watershed (65); Kahatchee Creek watershed (63); Yellowleaf Creek watershed (62); Tallassehatchee Creek watershed (62); Taylor Creek watershed (61); Chestnut Creek watershed (61); and Buxahatchee Creek watershed (60).

Only the Walnut Creek watershed was listed as a Priority 1 watershed in the SWCD watershed assessments, however, five of the watersheds were identified in the *Screening Assessment* as having a high potential for nonpoint source pollution. The five watersheds are Tallassehatchee Creek watershed, Walthall Branch watershed, Kahatchee Creek watershed, Beeswax Creek watershed, and Taylor Creek watershed.

Figure 145:

High Priority Watershed
Summary of Contributing Factors

First:	Lack of On-going Water Quality Monitoring by Citizens Impaired Water Bodies Presence of a High Number of Endangered Species
Second:	Growth Rate Urbanization of Land
Third:	Potential for Nonpoint Source Pollution

Moderate Priority Watersheds

The three watersheds that have a moderate priority in the Lower Coosa River Basin, in order of the highest rating score, are: Pigeon Roost Creek watershed (56); Weogufka Creek watershed (53); and Lower Hatchet Creek watershed (51). The Weogufka Creek watershed was identified in the NRCS watershed assessment as a Priority 1 watershed. None of the moderate priority watersheds were identified in the ADEM *Screening Assessment* as having high potential for nonpoint source pollution. The major contributing factors in the moderate priority watersheds were use classification standards in all three watersheds; poor soil composition in the two of the watersheds, the presence of a hydroelectric dam in two of the watersheds, high unemployment rates in two of the watersheds and a high number of endangered species in all three watersheds.

Rating scores in the moderate priority watersheds were generally either high or low with very few scores of 2, 3 or 4, indicating that these watersheds still have very significant factors affecting them, but not as many as the high priority watersheds.

Figure 146:

Moderate Priority Watershed Major Contributing Factors	
First:	Use Classification Standards
Second:	Soil Suitability for Development Presence of a Hydroelectric Dam 2000 Unemployment Rate
Third:	Number of Endangered Species

Low Priority Watersheds

The six watersheds that were ranked as low priority watersheds in the Lower Coosa River Basin, in order of the highest rating score, are: Peckerwood Creek watershed (49); Cedar Creek watershed (49); Weoka Creek watershed (46); Upper Hatchet Creek watershed (46); Socapatoy Creek watershed (44); and Middle Hatchet Creek watershed (43). The Peckerwood Creek watershed, located in Coosa County, was rated as a Priority 2 watershed in the NRCS watershed assessment. And, the Cedar Creek watershed was designated in the ADEM *Screening Assessment* as having a high potential for nonpoint source runoff.

In comparison to the high priority and moderate priority watershed, the low priority watersheds received considerably more "mid-range" scores, indicating that there are a number of factors impacting or having the potential to impact these watersheds, but possibly not quite as significantly as in the high and moderate priority watersheds. The three most significant contributing factors among the six low priority watersheds are septic system density, the lack of on-going water quality monitoring by citizens, and the number of endangered species present in the watersheds.

Figure 147:

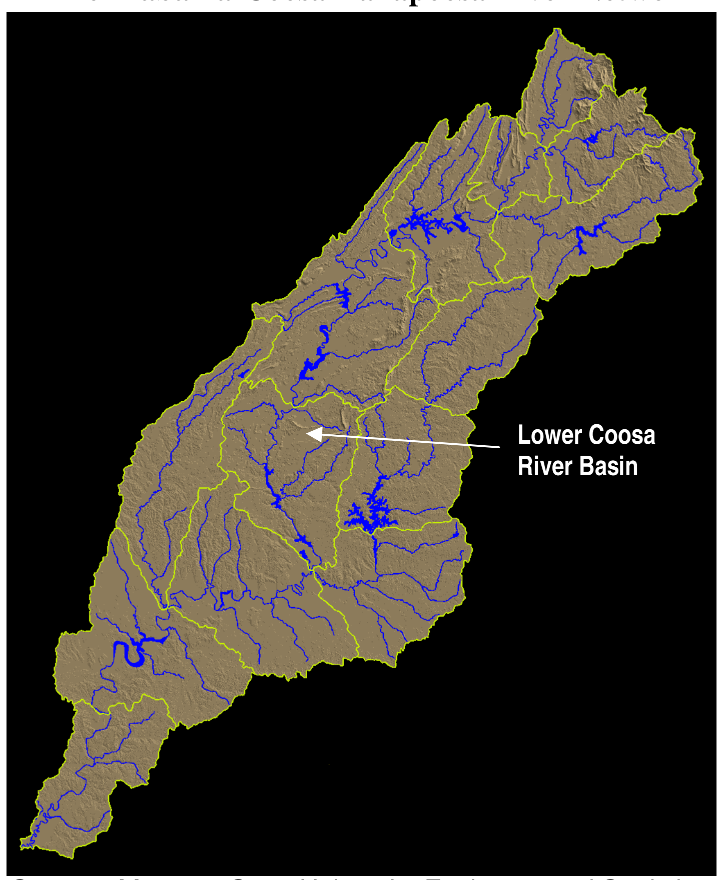
Low Priority Watershed Major Contributing Factors	
First:	Septic System Density Lack of On-going Citizen Water Quality Monitoring Number of Endangered Species
Second:	2000 Unemployment Rate Use Classification
Third:	Potential for Silviculture Soil Suitability for Development Housing Density

Chapter 13
Watershed Management Framework

The everyday lifestyle of the residents of the Lower Coosa River Basin impacts the water resources of the basin. Some activities consume a portion of the available water quantity. This portion is relatively small because much of the water is returned through discharges after treatment. Because there are upstream users, the residents of the Lower Coosa River Basin are using recycled water. Likewise, downstream water users also receive recycled water after it is used in the Lower Coosa River Basin.

Virtually every action in the Lower Coosa River Basin influences the water quality of the basin and downstream areas. When individuals assume responsibility for protecting water quality, their collective actions preserve the beneficial uses of water and minimize the economic investment required to preserve their quality of life. Likewise, when local water quality is preserved, the ability to use secondary treatment prior to discharge avoids the need to install and operate more expensive, tertiary treatment facilities, the cost of which is passed on to the consumer.

Figure 148:
The Lower Coosa River Basin Within The Alabama-Coosa-Tallapoosa River Network



Source: Montana State University Environmental Statistics Group, Graphical Locator. www.esg.montana.edu

This chapter discusses the overall framework for developing a basinwide management strategy for the Lower Coosa River Basin. First, the Lower Coosa River and the surrounding basin area play several roles within the broader picture of the Alabama-Coosa-Tallapoosa River network. These roles are reviewed from four perspectives. Understanding these roles and perspectives is necessary to provide a holistic approach to watershed management. Second is the framework for the Lower Coosa River Basin management measures – the outline for organizing the actions and tasks necessary to maintain water quality. And last, watershed issues and concerns are identified and categorized by the area affected.

Watershed Management Views

There are several perspectives from which management of the Lower Coosa River Basin can be viewed. First, the Lower Coosa River Basin is a part of the Coosa River, which in turn is a part of the greater Mobile River Basin. As a part of the Mobile River Basin, the Lower Coosa River Basin is obligated to act as a good "upstream neighbor, protecting and preserving the downstream systems impacting the Mobile Bay and estuary system, as well as maintaining a healthy river system that supports the economic diversity identified in the Mobile Basin Recovery Plan. Second, the Lower Coosa River Basin is downstream from other segments of the Coosa River and upstream from the Alabama River. Collectively, the entire river system has competing uses for the water in the Coosa River. Each part of the system must be a good steward of the water resources to ensure that all beneficial uses of water are fulfilled, the linkages being shown in Figure 144.

Based on the views of the Lower Coosa River Basin being set within the Mobile Basin and the Coosa River System there is a need for management that extends beyond the Lower Coosa River Basin. This need must be met by federal and state policy and regulation.

Third, within the Lower Coosa River Basin, there are 20 subwatersheds corresponding to the 11-digit hydrologic unit code. Some of these watersheds are small and have low-order streams flowing directly into the Coosa River. For example, the Walthall Branch watershed has a long dimension that is coincident with the bank of the Coosa River. There is both sheet flow and small streams that flow directly into the river as opposed to flowing into Walthall Branch. Larger watersheds, such as the Walnut Creek watershed, have some areas that drain directly to the Coosa River. The dominant portion of the watershed is drained by a stream network flowing to Walnut Creek, a primary tributary discharging into the Coosa River.

A few of the watersheds form larger areas because one watershed discharges into another watershed. For example, the Buxahatchee Creek watershed drains into Waxahatchee Creek. And, the Socapatoy Creek and Upper Hatchet Creek watersheds drain into the Middle Hatchet Creek watershed which in turn drains into Lower Hatchet Creek before discharging into the Coosa River.

As a result of the drainage configurations of the 20 subwatersheds, there are areas that primarily influence the Coosa River; there are watersheds with primary tributaries supported by a local stream network; and finally, there are watersheds that are interconnected as a system that must be viewed as a unit rather than as only being a watershed. Further, within the watersheds of the Lower Coosa River Basin, there is a need for both lake management and watershed management. Lake management concepts must address issues that are similar to watershed management and broader issues that are unique to the setting of the three lakes within the river system.

The fourth perspective is a blend of the regional setting perspectives of the Lower Coosa River Basin and the watershed perspective. This view recognizes that there are actions for which individual property owners, local organizations and agencies, city and county governments, and state agencies should assume responsibility.

Watershed Management Plan Development

Approaching water quality from within the watershed framework promotes the connection between water quality and the affect of activities on the surrounding land on water quality. Through planning and implementation of a plan developed within the watershed framework, it is possible to address the greatest number of causes of water quality problems rather than trying to just correct the resulting water quality in-stream through regulation and limitation of use of the water. This approach addresses both land-based and water-based issues.

During the public education and awareness portions of the planning process, local citizens were asked to respond to surveys regarding the identification of issues within the Lower Coosa River Basin and to provide comments regarding proposed management tools and alternatives. The purpose of these surveys and public comment opportunities was to integrate local observations with documented study results enabling the formulation of a management strategy that addressed both local and basinwide concerns with as little duplication of effort as possible.

The response rate to the first survey regarding water quality issues that were distributed in a series of 22 meetings with the local governments and home owner and boat owner associations was just under 10 percent, with 43 surveys returned. A summary of the first phase survey responses is provided in Figure 149. Responses to the survey indicate that approximately one-third of those in attendance at the meetings knew about the development of the Lower Coosa River Basin Management Plan and understood what nonpoint source pollution is. Responses show that residents thought that most common types of nonpoint source pollution present in the Lower Coosa River Basin are urban runoff, agricultural runoff, failing onsite septic systems, illegal dumping and sedimentation. Residents stated that the most harmful types of nonpoint source pollution are urban runoff and failing septic systems, followed distantly by illegal dumping, sedimentation and silviculture runoff. Locally identified water quality issues in the survey included pollutants, urban growth, high nutrient loads, point source discharges, and stream flow (quantity of water). Local issues are discussed in more detail later in this chapter.

Figure 149:

Lower Coosa River Basin Management Plan Stakeholder Survey Results
Approx. 439 Surveys Distributed; 40 Surveys Returned; 9.1% Response Rate

Awareness			
Were you aware of the on-going process to develop a watershed management plan for the Lower Coosa River Basin prior to receiving this survey?		Yes 21	No 18
Where did you learn of the effort to develop the Lower Coosa River Basin Management Plan?	City Council Meeting	10	
	County Commission Meeting	4	
	Civic Organization Meeting	1	
	Association/Club Meeting	13	
	Other: ADEM, Mail, AWWA, Word of Mouth	4	
Prior to learning about the Lower Coosa River Basin Management Plan, were you aware of any water quality problems of issues associated with the Lower Coosa River?		Yes 28	No 10
List / Explain: Runoff Problems (1); Pollutants (3); Mercury Levels in Fish (2); Upstream Contamination (1); Logging (1); Littering (3); Sewage (5); Alabama Power (1); Paper Mill (2); PCBs (8); 303(d) List (1); HOBO (2); Flooding (1); Turbidity (1); Media (3); HOBO Groups (3), Low Dissolved Oxygen (1), High Nutrient Load (2); Flow (2); Shelby County Growth (2)			

Watersheds of Interest:					
Tallassehatchee Creek	5	Spring Creek	11	Lower Hatchet Creek	8
Walthall Branch	2	Buxahatchee Creek	16	Walnut Creek	4
Yellowleaf Creek	22	Waxahatchee Creek	18	Chestnut Creek	2
Kahatchee Creek	4	Upper Hatchet Creek	9	Weoka Creek	4
Beeswax Creek	16	Socapatoy Creek	3	Pigeon Roost Creek	0
Cedar Creek	9	Middle Hatchet Creek	8	Taylor Creek	0
Peckerwood Creek	9	Weogufka Creek	8	Paint Creek	1
Dry Branch Creek	12	Sawmill Creek	1		

Nonpoint Source Pollution			
Do you know what nonpoint source pollution is and how it affects water quality?		Yes 27	No 12
What do you feel are the most common types of nonpoint source pollution present in the Lower Coosa River Basin?			
Urban Runoff	22	Sedimentation	14
Agricultural Runoff from Crops	18	Failing Onsite Septic Systems	18
Agri Runoff from Livestock, Poultry	12	Water-Related Rec. Activities	8
Silviculture Runoff	6	Illegal Dumping	16
Other: Litter (2); Fertilizer on Yards (1); Point Sources (2)			
Which of the types of nonpoint source pollution, as listed above, are the most harmful to water quality in the Lower Coosa River Basin? Septic Systems (8); Urban Runoff (10); All (1); Silviculture (3); Sedimentation (3); Illegal Dumping (3); Litter (1); Crop Runoff (2)			

Figure 149, Continued:

Implementation and Participation		
Do you, your business, organization, or club have any past, current and/or future watershed projects or activities in the Lower Coosa River Basin?	Yes 17	No 17
Project Name, Location and Description: Hidden Valley Association active in Paint Creek area Lake Jordon HOBO Clean Up Lake Mitchell HOBO Clean Ups (4) Lay Lake HOBO Clean Up (7) Shelby County Commission Environmental Program Lay Lake HOBO and Lake Mitchell Water Quality Monitoring (7) Clean Ups Christmas Tree Fish Habitat Enhancement Increased Aeration in Hydro Plants Lake Jordan HOBO Objectives for Lower Coosa River Basin Strategic Planning NEMO Program Involvement in Relicensing IAGs (1)		

Would you be interested and willing to participate in implementation activities as they are outlined in the Lower Coosa River Basin Management Plan, upon its completion? Area(s) of interest?			
Serving on a Committee	12	Stream Clean Ups	12
Installation of BMPs	7	Establishing Buffer Zones	6
Water Quality Monitoring	13	Education and Outreach	10
Nonpoint Source Training	6	Start a Watershed Group	1
Urban Forestry Programs	3	Not Interested	5

In response to citizen comments received in the first phase of the education and awareness part of the planning process and the inventory and research that had been conducted, preliminary protection measures were developed and organized into seven categories of watershed management activities, or tasks. These categories are education and outreach; water quality monitoring; plan development, coordination and compliance; sedimentation; urban management practices; pollution prevention and nuisance violations; and, stream remediation and protection.

During the meetings, residents were provided with examples of protection measures under each category and were then asked to vote on which category they felt was most important (i.e., would have the most impact) and which category they felt was the least important or would have the least impact. The resident voting results, shown in Figure 150, clearly show that, from the voting results, education and outreach and water quality management measures were thought to have the most impact on improving and maintaining water quality in the Lower Coosa River Basin.

Figure 150:

Watershed Management Categories for Protection Measures		
Category	**Most Important**	**Least Important**
Education and Outreach	16	5
Water Quality Monitoring	13	3
Plan Development, Coordination and Compliance	7	2
Sedimentation	7	13
Urban Management Practices	5	16
Pollution Prevention and Nuisance Violations	1	7
Stream Remediation and Protection	0	0
Source: Citizen responses during Phase II Public Education and Awareness Meetings held as a part of the Lower Coosa River Basin Management Planning Process. A series of five meetings held in Shelby, Talladega, Chilton, Coosa and Elmore Counties in May and June, 2004.		

Also during the Phase II meetings, residents were asked to review a list of the proposed protection measures by category and mark the watersheds where they felt these protection measures would be applicable. The results of this survey, which are shown in Figure 148, indicated there are a considerable number of protection measures that would be applicable throughout the basin rather than in just one or two watersheds. This is particularly true in the education and outreach, water quality monitoring and sedimentation categories. Those watershed management measure categories that appear to have had the least amount of widespread appeal to residents are urban management practices, pollution prevention and nuisance violations, and stream remediation and protection.

The citizen responses from both phases of the education and awareness part of the planning process were instrumental in the identification of water quality issues and in the development of protection measures to address the issues. Citizen guidance coupled with the inventory and analysis in Parts I and II of the plan made it possible to coordinate the necessary implementation tools for improving water quality with the areas where they are specifically needed. This can be viewed as constructing a tailored strategy as opposed to a one size fits all strategy. It is clear from the material presented thus far in this plan that, although there are many common denominators among the watersheds in the Lower Coosa River Basin, what works in one area may not work in another. And, vice versa, the citizen guidance also made it possible to coordinate activities that are affecting more than one watershed for a more comprehensive approach.

Figure 151:

Protection Measures by Basin

Summary: May and June, 2004

Please check the watersheds in which you feel the proposed protection measures would apply.

Issue	Tallassehatchee	Walthall	Yellowleaf	Kahatchee	Beeswax	Cedar	Peckerwood	Spring	Buxahatchee	Waxahatchee	Upper Hatchet	Socapatoy	Middle Hatchet	Weogufka	Lower Hatchet	Walnut	Chestnut	Weoka	Pigeon Roost	Taylor
EDUCATION AND OUTREACH																				
Single Point of Contact/Info Repository				X	X	X											X	X	X	X
Participation in Lower Coosa Clean Water Partnership Committies				X			X				X	X	X	X	X	X	X	X	X	
Sector Representation				X													X	X	X	X
Citizen Workshops and Seminars	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	
Public Education Workshops	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Non-Point Source Education. for Municipal Officials	X		X	X	X	X	X			X	X	X	X	X	X	X	X	X	X	
Festivals/Fairs (Earth Day/Water Festival)	X		X	X	X						X		X		X			X	X	
Promotional Brochures and Materials	X		X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X
Special Message Signage				X						X	X	X	X	X	X		X	X	X	X
Anti-Litter Programs	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Water Conservation Programs				X		X	X										X			
Storm Drain Stenciling	X		X	X																
News Media	X		X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X
Stream Clean Ups	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Recreational Use Impacts				X			X			X	X	X	X	X	X	X	X	X	X	X
WATER QUALITY MONITORING																				
Alabama Water Watch Program Training	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Alabama Water Watch Participation	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Establish Trend Data	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Support SWCC Rotational Assessments	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X
Support ADEM Rotational Assessments				X	X		X				X	X	X	X	X	X	X	X	X	X
Regular Biological Assessment	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X			X	X	X
USGS Stream Gauging				X	X		X				X	X	X	X	X	X	X	X		
PLAN DEVELOPMENT, COORDINATION AND COMPLIANCE																				
Compliance with Recovery Plan for Mobile River Basin Aquatic Ecosystem				X	X	X	X	X	X	X	X	X	X	X	X			X	X	
Wetland Preservation Strategy	X		X	X	X	X	X	X	X	X						X	X	X	X	X
Natural Resource / Conservation Planning by County	X		X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X
Floodplain Management				X	X												X	X	X	
Emergency Drought Management				X													X			
Existing Pollution Programs	X		X	X			X				X	X	X	X	X	X	X	X	X	X
Recycling Programs				X			X			X	X	X	X	X	X		X	X	X	X
Clean Lakes Program	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Issue	Tall'assehatchee	Walthall	Yellowleaf	Kahatchee	Beeswax	Cedar	Peckerwood	Spring	Buxahatchee	Waxahatchee	Upper Hatchet	Socapatoy	Middle Hatchet	Weogufka	Lower Hatchet	Walnut	Chestnut	Weoka	Pigeon Roost	Taylor
URBAN MANAGEMENT PRACTICES																				
Zoning	■		■	■	■	■	■										■	■	■	■
Impervious Surface Area Standards	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Water Resource Overlays				■													■			
Subdivision Regulations	■		■	■	■												■	■	■	■
Erosion and Sediment Control	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Conservation Easements	■		■	■													■	■	■	■
Stormwater Mgmt by Development	■		■	■	■												■	■	■	
Special Ordinances			■	■														■	■	■
Moratoria			■	■													■			
Building Codes	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Nuisance Ordinance	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Acquisition Programs				■														■	■	
Voluntary				■	■		■				■	■	■	■	■			■		
Eminent Domain / Condemnation				■												■	■			
Retention Pond Requirements				■	■												■	■	■	
Use of Reinforced Turf Parking Areas				■	■												■	■	■	
POLLUTION PREVENTION AND NUISANCE VIOLATIONS																				
Health Regulations	■			■		■	■										■	■	■	■
Illegal Dumping	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Failing On-Site Sewage Systems	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Existing Programs and Regulations				■			■				■	■	■	■	■		■	■	■	
Animal Waste Nutrient Guidelines				■	■					■				■			■	■	■	■
Increase Standards for Surface Mining				■										■				■	■	■
Improve Guidelines for Ag Chemicals				■													■	■		
Coordinate Ag Chemical Disposal Days				■													■			
Install Irrigation Backflow Prev. Devices				■	■															
Stormwater Runoff Management	■		■	■	■	■	■	■	■	■							■	■	■	
Well Protection and Management				■														■	■	■
Special Pollution Control Ordinances				■													■	■	■	■
Recreational Use Stewardship Programs	■		■	■	■					■	■	■	■	■	■		■	■	■	
SEDIMENTATION																				
Construction Best Mgmt Practices	■		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Agricultural Best Management Practices	■		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Silviculture Best Management Practices	■		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Promote Forest Land Stewardship	■		■	■	■	■	■	■	■	■	■	■	■	■	■		■	■	■	■
Erosion and Sediment Control Ordinaces	■		■	■									■	■	■		■	■	■	■
Unpaved Roads	■		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Home Gardening Programs	■		■	■	■	■	■	■	■	■							■	■	■	
STREAM REMEDIATION AND PROTECTION																				
Impaired Streams			■	■		■	■		■	■										
Local NPS Watershed Mgmt Programs				■							■		■	■		■	■	■	■	
Recreational Use Guidelines				■	■						■	■	■	■	■	■	■			
Streambank Restoration				■		■	■				■		■		■		■	■	■	■
Stream Buffers				■							■	■	■	■	■		■	■	■	■
Thermal Pollution				■																

Watershed Issues and Concerns

Watershed issues and concerns affecting the Lower Coosa River Basin are derived from the inventory and analysis of existing conditions presented in Parts I and II of this plan in conjunction with citizen observations and locally-identified issues. A brief explanation of each issue is provided in Chapter 14: Water Quality Improvement Program, along with management measures to address the issue. For more detailed information regarding the specific conditions, refer to the appropriate section of the plan. For example, information on endangered species can be found in Chapter 4: Ecoregions and Habitat, and information on Low Dissolved Oxygen can be found in Chapter 10: Water Quality Monitoring. The watershed issues and concerns have been categorized based on the geographical area that is impacted by the issue. Some issues affect the entire Lower Coosa River Basin, while others may affect, or be present in, one or two watersheds. The issue categories are basin-wide issue, regional issues, and local concerns.

Basin-wide Issues. These issues affect all watersheds in the Lower Coosa River Basin and should be addressed from a holistic, basin perspective rather than a watershed by watershed. Due to either the nature of these issues or their widespread geographic impact, these issues require the coordinated efforts of all residents and organizations in the basin for management efforts to be effective. Basin-wide issues identified include:

- Endangered Species
- Illegal Dumping
- FERC Relicensing of Hydroelectric Facilities
- Lack of Water Quality Trend Data
- Lack of Education and Awareness

Regional Issues. These issues are present in more than five watersheds but do not impact the entire basin. Identification of regional issues provides the opportunity to coordinate with a larger pool or residents and organizations in the implementation of management measures. Furthermore, some of the regional issues cross watershed boundaries and must be addressed at a level larger than the local watershed. Regional issues identified and the watersheds that are affected are as follows:

Issue	Watersheds Affected
▪ Compliance with the Recovery Plan for the Mobile River Basin Aquatic Ecosystem	Tallassehatchee Creek Watershed Yellowleaf Creek Watershed Buxahatchee Creek Watershed Upper Hatchet Creek Watershed Middle Hatchet Creek Watershed Weogufka Creek Watershed Lower Hatchet Creek Watershed Pigeon Roost Creek Watershed Taylor Creek Watershed

Issue	Watersheds Affected
▪ Designation as a Critical Habitat	Yellowleaf Creek Watershed Upper Hatchet Creek Watershed Middle Hatchet Creek Watershed Lower Hatchet Creek Watershed Pigeon Roost Creek Watershed Taylor Creek Watershed
▪ Growth Rate, Population Increase and Urban Development	Walthall Branch Watershed Yellowleaf Creek Watershed Beeswax Creek Watershed Spring Creek Watershed Buxahatchee Creek Watershed Waxahatchee Creek Watershed Walnut Creek Watershed Chestnut Creek Watershed Weoka Creek Watershed Pigeon Roost Creek Watershed Taylor Creek Watershed
▪ Agricultural Runoff	Tallassehatchee Creek Watershed Walthall Branch Watershed Yellowleaf Creek Watershed Kahatchee Creek Watershed Beeswax Creek Watershed Cedar Creek Watershed Spring Creek Watershed Weogufka Creek Watershed Walnut Creek Watershed Chestnut Creek Watershed Pigeon Roost Creek Watershed Taylor Creek Watershed
▪ Silviculture Runoff	Tallassehatchee Creek Watershed Kahatchee Creek Watershed Cedar Creek Watershed Peckerwood Creek Watershed Spring Creek Watershed Buxahatchee Creek Watershed Waxahatchee Creek Watershed Upper Hatchet Creek Watershed Socapatoy Creek Watershed Middle Hatchet Creek Watershed Weogufka Creek Watershed Lower Hatchet Creek Watershed Walnut Creek Watershed

Issue	Watersheds Affected
▪ Urban Runoff	Tallassehatchee Creek Watershed Walthall Branch Watershed Yellowleaf Creek Watershed Kahatchee Creek Watershed Beeswax Creek Watershed Spring Creek Watershed Buxahatchee Creek Watershed Waxahatchee Creek Watershed Walnut Creek Watershed Chestnut Creek Watershed Pigeon Roost Creek Watershed Taylor Creek Watershed
▪ Sedimentation	Walthall Branch Watershed Yellowleaf Creek Watershed Kahatchee Creek Watershed Beeswax Creek Watershed Cedar Creek Watershed Spring Creek Watershed Buxahatchee Creek Watershed Waxahatchee Creek Watershed Taylor Creek Watershed
▪ Nutrients, Algal Growth, and Invasive Species	Beeswax Creek Watershed Cedar Creek Watershed Peckerwood Creek Watershed Spring Creek Watershed Buxahatchee Creek Watershed Waxahatchee Creek Watershed Lower Hatchet Creek Watershed Walnut Creek Watershed Chestnut Creek Watershed Weoka Creek Watershed
▪ Low Dissolved Oxygen / Organic Enrichment	Walthall Branch Watershed Kahatchee Creek Watershed Beeswax Creek Watershed Cedar Creek Watershed Peckerwood Creek Watershed Spring Creek Watershed Waxahatchee Creek Watershed Lower Hatchet Creek Watershed Walnut Creek Watershed Chestnut Creek Watershed Weoka Creek Watershed

Issue	Watersheds Affected
▪ Upstream Contamination	Beeswax Creek Watershed Cedar Creek Watershed Peckerwood Creek Watershed Spring Creek Watershed
▪ Temperature and Thermal Stress	Peckerwood Creek Watershed Waxahatchee Creek Watershed Lower Hatchet Creek Watershed Walnut Creek Watershed Chestnut Creek Watershed Weoka Creek Watershed
▪ Priority Organics (PCBs)	Walthall Branch Watershed Kahatchee Creek Watershed Beeswax Creek Watershed Cedar Creek Watershed Peckerwood Creek Watershed Spring Creek Watershed
▪ Mining Runoff	Kahatchee Creek Watershed Cedar Creek Watershed Peckerwood Creek Watershed Buxahatchee Creek Watershed Waxahatchee Creek Watershed

Local Concerns. These issues are present in only one to five watersheds, and the watersheds do not have strong geographical connections. Most of the local issues were derived from citizen comments and observations, however, many of the issues identified by citizens were common among watersheds and became regional and basin wide issues. One citizen concern that is not included in this list, although it was identified by several citizens, is the mercury level in fish. While there was once a fish consumption advisory in the Lay Lake area due to mercury levels in fish, this consumption advisory in this area is no longer valid. Local issues that have been identified and the watersheds that are affected are as follows:

Issue	Watersheds Affected
▪ Bacteria	Socapatoy Creek Watershed Weoka Creek Watershed
▪ Flooding	Weoka Creek Watershed Taylor Creek Watershed
▪ Turbidity	Weoka Creek Watershed Taylor Creek Watershed

Issue	Watersheds Affected
▪ Point Source Discharges	Tallassehatchee Creek Watershed Walthall Branch Watershed Beeswax Creek Watershed Buxahatchee Creek Watershed Middle Hatchet Creek Watershed
▪ Low Flow	Beeswax Creek Watershed

Chapter 14
Water Quality Improvement Strategy

The goal of the Lower Coosa River Basin Management Plan and its implementation is *to design and prepare a locally endorsed and supported plan that can be cooperatively implemented through private incentives and by local and state government programs to maintain the beneficial uses of water throughout the Lower Coosa River Basin*. This goal is supported by the identification of water quality issues and concerns and the location of these concerns by watershed, utilizing the boundaries of the NRCS11-digit HUC code.

Further, the goal of the plan is supported by the identification of watershed management and protection measures to address each of the water quality issues that was identified in the planning process. The watershed management measures are organized in this Water Quality Improvement Program by issue and then within a framework of seven categories of management tools. These categories group the management measures by the type of activity that is proposed. The Water Quality Improvement Program then identifies the organizations that might be responsible for implementation of the management measure, or task. Potential funding and other resources can be found in Appendix E. The seven categories of management tools and explanation of the type of activities included in each category are as follows:

Education and Outreach: These management measures teach people about water, water quality and the effect people have on the resource. The results are long-term in nature. The breadth of coverage depends on the intensity of effort put into education and outreach efforts. These activities may also provide guidance to citizens on how to conduct everyday tasks with the least harmful impact on water quality.

Water Quality Monitoring: Monitoring activities assesses the quality of water at a specific time and location. Over the moderate-to-long term, samples can be taken at the same location to determine trends, which may indicate declining or improving water quality. Declining trends should be researched to determine what has occurred in the watershed to cause the decline. Improving trends will hopefully be related to implementation of identifiable protection measures.

Plan Development, Coordination and Compliance: Activities in this category have short, intermediate and long term benefits. Coordination with state and federal agencies will allow existing programs and projects to be implemented in the short term. Obtaining compliance with existing plans, such as the *Recovery Plan for the Mobile Rive Basin Aquatic Ecosystem*, implements local activities that are necessary to improve overall water quality in a larger basin area and avoid future conflicts with federal and state agencies. Plan development will continue to enhance the understanding of conditions and issues in the Lower Coosa River Basin and outline a flexible, but methodical course of action for local water quality improvements.

Sedimentation: Activities in this category address topical areas of stormwater runoff, such as construction, dirt roads, agriculture and silviculture, that, when not properly managed, result in increased erosion and potential deposition of sediment in creeks, streams and the Coosa River. These types of protection measures may also relate to other types of protection measures, such as education and outreach.

Urban Management Practices: These management measures are regulatory in nature and are reliant upon the enforcement of local ordinances and regulations, such as zoning ordinances, subdivision regulations, and stormwater management ordinances. Through proper development and enforcement of these ordinances and regulations, local governments are able to guide growth and development in a manner that safeguards local water resources and their water quality.

Pollution Prevention and Nuisance Violations: Protection measures in this category include actions that are short-term in nature. The actions address readily recognizable problems that can be addressed by enforcement of existing laws and regulations. The benefits should immediately enhance water quality by improving existing conditions or preventing short term deterioration.

Stream Remediation and Protection: Remediation activities protect water quality from future deterioration by addressing problem areas that already exist and are causing water quality problems. The benefits are short-to-long-term in nature. However, the problems to be addressed may be relatively costly. A methodical program that addresses problem areas over an extended period of time will likely be required. To be cost effective, a prioritization of problem areas will be required.

As reflected in the citizen survey in the second phase of the education and outreach component of the Lower Coosa River Basin Management Plan planning process, the watershed management categories that are deemed to be the most effective are education and awareness and water quality monitoring. In fact, the lack of these tools is so prevalent in the Lower Coosa River Basin that they were identified as basinwide issues.

For each issue, the Water Quality Improvement Program provides a summary sheet that describes the issue and the sources of the problem, shows the watersheds where the issue has been identified and outlines watershed management strategies under the seven categories of watershed management tools. Some of the categories of watershed management tools, however, may not apply to all issues. Using the strategies as a guide, protection measures, or activities, are then presented for implementation. The issues are organized with basinwide issues first, regional issues second, and local issues third. The exceptions to this are that protection measures for the issues of endangered species, compliance with the *Recovery Plan for the Mobile River Basin Aquatic Ecosystem* and designation as a critical habitat have been grouped together due to the similar nature of these activities. Likewise, upstream contamination and priority organics have been addressed together and nutrients and low dissolve oxygen/organic enrichment have been grouped together since low dissolved oxygen is generally a result of nutrient issues.

Protection measures included in this Water Quality Improvement Program are directed towards addressing nonpoint source pollution, which is the charge of this plan. Therefore, protection measures for issues and concerns regarding point source pollution have not been developed. These include FERC Relicensing of Hydroelectric Facilities, Upstream Contamination, and Priority Organics.

In addition, protection measures have not been developed for the five local concerns due to the low rate of incidence and lack of data to substantiate these concerns as issues. This does not mean that these concerns are not warranted; instead, these concerns are warranted, however, more research is needed to determine if the concern is continuing to occur and define sources of the problems.

Issues and Concerns

The topics along the left side of the following table are the issues and concerns that have been identified in the Lower Coosa River Basin. The individual watersheds are listed across the top of the table. The "X" identifies the watershed where the issue is applicable. As shown, some concerns are of basinwide significance, while some concerns are only applicable within specific watersheds.

Figure 152:

Lower Coosa River Basin Issues by Watershed																					
		Watershed																			
	Issue	Tallassehatchee Creek	Walthall Branch	Yellowleaf Creek	Kahatchee Creek	Beeswax Creek	Cedar Creek	Peckerwood Creek	Spring Creek	Buxahatchee Creek	Waxahatchee Creek	Upper Hatchet Creek	Socapatoy Creek	Middle Hatchet Creek	Weogufka Creek	Lower Hatchet Creek	Walnut Creek	Chestnut Creek	Weoka Creek	Pigeon Roost Creek	Taylor Creek
Basinwide Issues	Endangered Species	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	Compliance with Recovery Plan for the Mobile River Basin Aquatic Ecosystem	X		X						X		X		X	X	X				X	X
	Designation as a Critical Habitat			X								X		X		X				X	X
	Lack of Water Quality Trend Data	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	Illegal Dumping	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	Lack of Education and Awareness	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	FERC Relicensing of Hydroelectric Facilities	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Regional Issues	Growth Rate and Urban Development		X	X		X			X	X	X						X	X	X	X	X
	Agricultural Runoff	X	X	X	X	X	X		X						X		X	X		X	X
	Silviculture Runoff	X			X		X	X	X	X	X	X	X	X	X	X	X				
	Urban Runoff	X	X	X	X	X			X	X	X						X	X		X	X
	Sedimentation		X	X	X	X	X		X	X	X										X
	Nutrients, Algae, Invasive Species					X	X	X	X	X	X					X	X	X	X		
	Low Dissolved Oxygen		X		X	X	X	X	X		X					X	X	X	X		
	Upstream Contamination					X	X	X	X												
	Temperature and Thermal Stress							X			X					X	X	X	X		
	Priority Organics (PCBs)		X		X	X	X	X	X												
	Mining Runoff				X		X	X		X	X										
Local Issues	Bacteria												X						X		
	Turbidity																		X	X	
	Flooding																		X	X	
	Point Source Discharges	X	X			X				X				X							
	Low Flow					X															

Bacteria. Water quality parameters for bacteria are based on testing for fecal coliform, which is a bacteria found in the intestinal tracts of mammals, and therefore, in fecal matter. The presence of fecal coliform in water or sludge is an indicator of pollution and possible contamination by pathogens. The presence of E. coli at levels considered unsafe for human contact (600 colonies per 100 mL of water) was identified in the Socapatoy Creek and Weoka Creek watersheds. Bacteria counts at a caution level, however, have been reported in the Lay Lake area, as well. Bacteria was identified in the Weoka Creek watershed as a result of citizen monitoring in 1999 and 2000 which reported three incidences of E. coli colony counts in the range that is considered unsafe for human contact. In a study conducted by the Alabama Rivers Alliance of the Hatchet Creek area in 1999 and 2000, E. coli counts greater than 600 colonies per 100 mL of water were reported at seven sites in the Socapatoy Creek watershed. To address this concern, additional water quality monitoring is needed to determine if the conditions still exist or if the incidences were isolated events. Bacterial monitoring, which is limited among citizen water quality monitoring, should be increased. These items are addressed under the Lack of Water Quality Trend Data issue.

Turbidity. Defined as the amount of particulate mater that is suspended in water, turbidity measures the scattering effect that suspended solids have on light – the higher the intensity of scattered light, the higher the turbidity. Material that causes light to be turbid include clay, silt, finely divided organic and inorganic matte, soluble colored organic compounds, plankton, and microscopic organisms. In short, turbidity makes the water cloudy or opaque. Turbidity was reported as a concern in two watersheds: the Weoka Creek watershed and the Pigeon Roost watershed. Sources of the suspended solids have not been identified, however, turbidity is often a result of sedimentation. To address this concern, additional water quality monitoring is needed to determine if the condition still exist or if the incidences were isolated events. Turbidity is measured in the citizen water quality monitoring process. Additional long-term monitoring is needed to establish trend data for this parameter. This item is addressed under the Lack of Water Quality Trend Data issue and protection measures outlined under Sedimentation may be implemented until additional data is available.

Flooding. Identified by residents in the Weoka Creek watershed and the Pigeon Roost watershed, flooding is a local concern that has the potential for a huge impact. The causes of flooding conditions are numerous and can be difficult to isolate and identify. In these particular watersheds, flooding could be a result of change in lake levels, a result of sedimentation in streams to the point that water is overflowing the stream banks, or a result of stream flow being altered or impacted by development, causing water to flood in new locations. To address flooding with watershed management measures, it will be necessary to first identify the causes of flooding and to determine if the flooding conditions are becoming more frequent or more intense. These things can be done through education and awareness and water quality monitoring by ensuring that residents are aware of their surroundings so that changes in their surroundings are noticed and documented to establish trend data and for development of protection measures.

Point Source Discharges. Organizations, businesses and industries that discharge water back into waterbodies or rivers are called point source dischargers and regulated under the National Permit Discharge Elimination System (NPDES) process. Pollution from point source discharges (i.e., permit violations) was identified as a local concern in the following five watersheds: Tallassehatchee Creek, Walthall Branch, Beeswax Creek, Buxahatchee Creek, and Middle Hatchet Creek. The organizations that were named include the Alabama Power Gaston Steam Plant, Bowater (formerly Kimberly Clark), the Childersburg Wastewater Treatment Plant, and the Calera Wastewater Treatment Plant.

Point source dischargers are monitored on a regular basis and are required to submit a monthly monitoring report that indicates whether or not the discharge is in violation of permit limitations. When a violation does occur, it is handled through the regulatory means available to the Alabama Department of Environmental Management at the state level and the Environmental Protection Agency at the federal level. Therefore, this concern is beyond the scope of this plan to address nonpoint source pollution. A review of NPDES permit violations on the Environmental Protection Agency website (Enforcement & Compliance History Online – ECHO), however, shows that only one organization in the Lower Coosa River Basin has experienced formal enforcement action in the last three years. This was the City of Columbiana Wastewater Treatment Plant.

Low Flow. Identified as a local concern in the Beeswax Creek watershed, low flow is a condition in which streams are flowing at a rate slower than their normal flow. Although this concern is related to water quantity rather than water quality, it is important to understand that flow conditions (both high and low) can have a significant impact on water quality. The rate of flow can affect that amount of dissolved oxygen in the water (which is necessary for aquatic specie survival), the temperature of the water, and aquatic habitat. To address a condition of low flow, the normal flow of the stream must be known or established through a history of flow measurements as a basis for comparison over time. Another way to determine low flow conditions is through stream gauging of the surrounding streams as a comparison with a larger area. Stream gauging, however, is limited in the Lower Coosa River Basin due to costs. To address this concern, more information and data will be needed to identify causes and establish trend data. Some of these items are addressed under the Lack of Water Quality Trend Data and Education and Awareness issues.

On the following pages, watershed management and protection strategies are outlined to address the following issues: endangered species, compliance with the Recovery Plan for the Mobile River Basin Aquatic Ecosytem and designation as a critical habitat; a lack of water quality trend data; illegal dumping; a lack of education and awareness; growth rates and urban development; agricultural runoff; silviculture runoff; urban runoff; sedimentation; nutrients and low dissolved oxygen/organic enrichment; temperature and thermal stress; and, mining runoff. Following the watershed management and protection strategies is a matrix of management measures, or tasks, to be implemented. For each management measure, the issue or issues that it addresses and the organizations and/or people responsible for implementation of the measure have been identified. The following list provides acronyms that have been utilized to identify these organizations and persons.

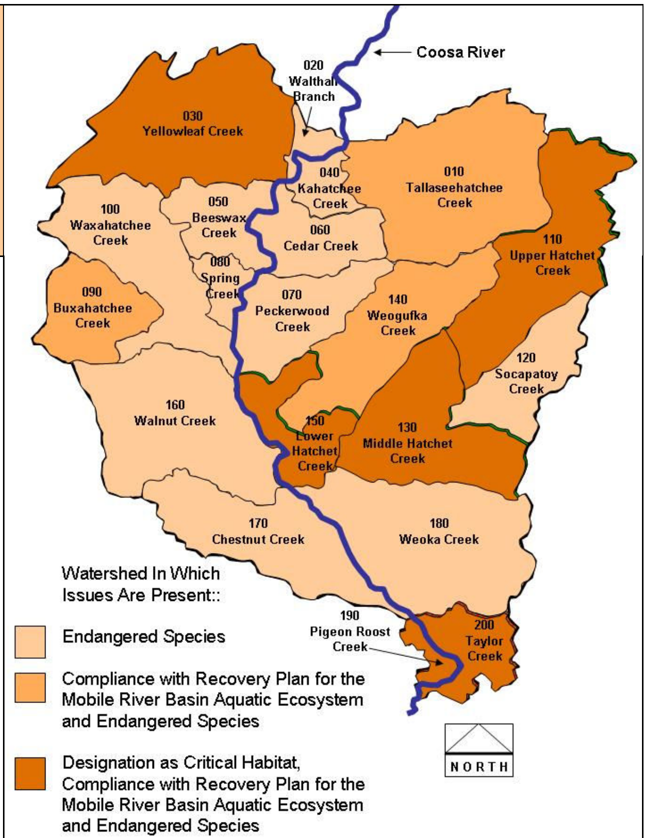
A&I	Alabama Department of Agriculture and Industries
ACES	Alabama Cooperative Extension System
ACWP	Alabama Clean Water Partnership

ADCNR	Alabama Department of Conservation and Natural Resources
ADEM	Alabama Department of Environmental Management
ALDOT	Alabama Department of Transportation
ADPH	Alabama Department of Public Health
AFA	Alabama Forestry Association
AFC	Alabama Forestry Commission
ALFA	Alabama Farmers Federation
APCO	Alabama Power Company
APPCo	Alabama Pulp and Paper Council
AWW	Alabama Water Watch
COE	Corps of Engineers
EPA	Environmental Protection Agency
GF	Groundwater Foundation
GSA	Geological Survey of Alabama
HBAA	Home Builders Association of Alabama
HOBO	Reservoir Homeowner/Boatowner Associations
LCRB SC	Lower Coosa River Basin Steering Committee
LCRB EC	Lower Coosa River Basin Education and Outreach Committee
NEMO	Nonpoint Education for Municipal Officials
NHP	Natural Heritage Program
NRCS	Natural Resources Conservation Service
PALS	People Against a Littered State
RCD's	Resource Conservation and Development Councils
RPCS	Regional Planning Commissions
SWCD	County Soil and Water Conservation Districts
SWCS	Soil and Water Conservation Society
TFP	Treasure Forest Program
TNC	The Nature Conservancy
USFWS	US Fish and Wildlife Service
USDA	US Department of Agriculture
USGS	US Geological Survey, Office of Water Resources

Endangered Species

- **Compliance with the *Recovery Plan for the Mobile River Basin Aquatic Ecosystem***
- **Designation as a Critical Habitat**

The presence of endangered species is a basinwide issue, with a minimum of 24 species present in each watershed and up to 46 species present in the Chestnut Creek watershed. Endangered species are an indicator of the health of the ecosystem, and as such, are vital to the continued health of the basin and the residents who reside there. The endangered species addressed in this plan were identified by the U.S. Fish and Wildlife Service. Recovery of these species is outlined by the *Recovery Plan for the Mobile River Basin Aquatic Ecosystem*, as indicated. Watersheds identified as critical habitat include areas designated on July 1, 2004 in the Federal Register, 50 CFR Part 17.



Strategies	
Education and Outreach	Increase the awareness among citizens, businesses and local governments of the presence of a significant number of endangered species in the Lower Coosa River Basin and how we might responsibly interact with them in our daily lives.
Water Quality Monitoring	Utilize on-going citizen monitoring activities and stream assessments to record and monitor sensitive habitat areas.
Plan Development, Coordination and Compliance	Provide ways that local citizens can assist in meeting the requirements of endangered species recovery plans, with emphasis on the Recovery Plan for the Mobile River Basin Aquatic Ecosystem.
Pollution Prevention and Nuisance Violations	Provide methods of protecting sensitive and critical habitats from surrounding land uses and water uses and their potential impact on identified endangered species.
Stream Remediation and Protection	Provide methods of protecting streams that are known, or candidate, habitats from further degradation of water quality.

Lack of Water Quality Trend Data

The health of the basin is dependent on long-term water quality trend data to determine if water quality is improving, becoming worse or remaining stable. This type of trend data can only be accomplished by on-going water quality monitoring and habitat assessment. To be truly effective and cost effective, water quality monitoring will need to be conducted by volunteer water quality monitors in conjunction with professional monitoring efforts. Although volunteer monitoring activity is present in six of the watersheds, more sites should be monitored. The remaining 14 watersheds have no volunteer water quality monitoring activity as of November 2004. As a result of the limited water quality monitoring activity present in the Lower Coosa River Basin, the lack of water quality trend data is a basinwide issue.

Strategies

Education and Outreach	▪ Increase citizen, government and business awareness of the need for local water quality monitoring activities of large and small waterbodies. ▪ Facilitate and recognize local involvement in on-going water quality monitoring activities.
Water Quality Monitoring	▪ Support and encourage state and federally funded basin assessments on a rotational basis to provide in-depth and continuous water quality data to establish trends in water quality in the Lower Coosa River Basin. ▪ Establish local water quality monitoring programs for each of the watersheds through site identification and local contact.
Plan Development, Coordination and Compliance	Establish a mechanism for tracking results of water quality monitoring in the Lower Coosa River Basin.
Urban Management Practices	Encourage local county and municipal governments to include a water quality monitoring component as a part of their local stormwater management plans.
Pollution Prevention and Nuisance Violations	Encourage centralized results of stream and lake clean-up efforts by quantifying results to gage increases or decreases in pollution and to identify target areas.

Illegal Dumping

Illegal dumping is the disposal of trash and/or waste in an unpermitted area, such as on a stream bank, in a gully, or in other off-road areas. Because of the prevalence of this type of activity and the lack of regulatory means to stop it, illegal dumping is a basinwide issue affecting all of the watersheds. **Littering** is similar to illegal dumping, but generally on a smaller scale. Illegal dumping and littering can present water quality issues through the runoff of harmful chemicals into creeks and streams, not to mention the aesthetic blight cast upon the waterbodies. These are two of the most commonly cited issues in the Lower Coosa River Basin, causeds, for the most part, by the residents who live there.

Strategies

Education and Outreach	Increase citizen awareness of what illegal dumping is and what the alternatives may be, as well as encouraging participation in remedial and prevention programs
Water Quality Monitoring	Through the identification and location of illegal dumping areas, establish historical data of both old and new problem areas to develop trend data and provide basis for future actions.
Pollution Prevention and Nuisance Violations	Establish programs to eliminate the illegal dumping of trash and waste in unpermitted areas.
Stream Remediation and Protection	Establish and support on-going clean-up efforts to minimize and eliminate illegal dumps.

Lack of Education and Awareness

The lack of education and awareness regarding water quality, nonpoint source pollution, and the resulting water quality issues is a basinwide concern. Major sources of nonpoint source pollution are the individual everyday activities of residents, businesses and industries. Many of these activities, though unintentional, add to the cumulative affect of the slow degradation of water quality in the Lower Coosa River Basin. Therefore, this issue should be addressed at both the basinwide and local levels by increasing awareness of water quality issues, through the education of residents regarding the impact of nonpoint source pollution, and through the provision of alternative ways to accomplish the tasks of everyday lives.

Strategies

Education and Outreach	Initiate basinwide educational campaign to educate citizens about their individual impact on, and responsibility for, maintaining water quality.
Sedimentation	Identify and publicize home-based actions that can have a positive influence on reducing sedimentation in nearby waterbodies.
Pollution Prevention and Nuisance Violations	Identify and publicize home-based pollution prevention actions that can have a positive influence on maintaining water quality.
Stream Remediation and Protection	Identify and publicize home-based actions that can have a positive influence on the protection of local streams.

FERC Relicensing of Hydroelectric Facilities

Alabama Power Company's Lay Lake Dam, Lake Mitchell Dam and Lake Jordan Dam and associated hydroelectric facilities are scheduled for relicensing in 2007 under the Federal Energy Regulatory Guidelines (FERC). These licenses run for a period of 30 to 50 years. For this reason, the FERC relicensing process of the hydroelectric facilities was identified as a basinwide issue. Management measures, however, were not developed for this issue because it is a federal regulatory process beyond the scope of this plan, which is to address nonpoint sources of pollution.

Summary	All three dams located in the Lower Coosa River Basin are operated in a run-of-river mode in which peak flows from upstream project operations are passed directly through the powerhouse, with very little lake fluctuation as a result of daily flow releases. Alabama Power Company's relicensing process for the Coosa River hydro power facilities began in 2000. The relicensing application process is a multi-year process and Alabama Power must file the application by July 31, 2005 to continue generating electricity and operating the reservoirs beyond 2007. Since 2000, numerous residents and agencies of the Lower Coosa River Basin including federal and state resource agencies, local and national non-governmental agencies, home and boat owner associations, and individuals have met with Alabama Power to identify and resolve issues related to the operation of the facilities. The public comment period for the application process ended prior to the completion of this plan, however, citizens and agencies are encouraged to continue following the process. More information on the FERC relicensing process is available at the Alabama Power Company website. (www.southerncompany.com/alpower)

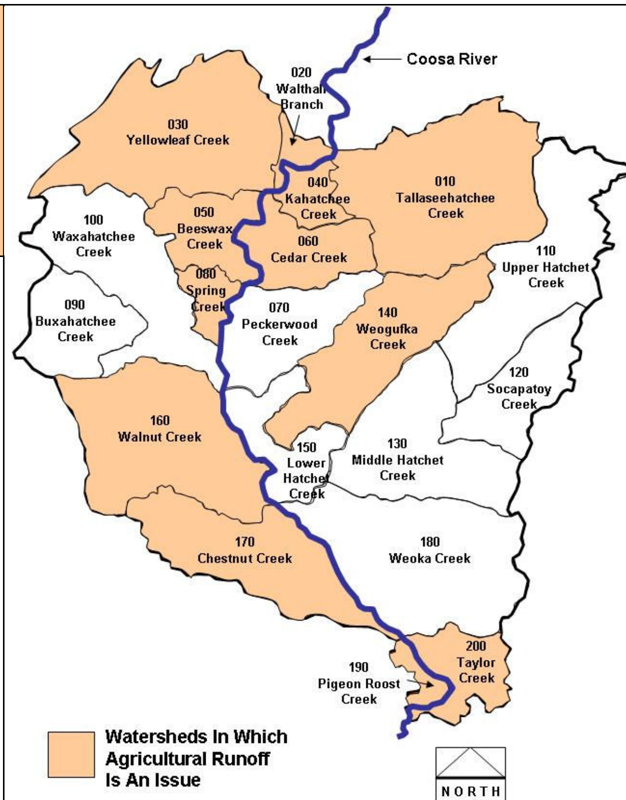
Growth Rate and Urban Development

Population growth, housing growth, commercial growth, traffic volume increases and urban development of previous agricultural and forested land are issues in 11 of the 20 watersheds in the Lower Coosa River Basin. Population projections indicate that substantial population increases in these areas are expected to continue, with a projected 49,063 additional persons in the Lower Coosa River Basin by 2025 and a projected increase of 407,000 persons in the seven-county area of the Lower Coosa River Basin by 2050. Two of the most significant impacts of the additional growth may include increased use of the Lower Coosa River water resources and increased runoff due to the increase in impervious surface area.

Strategies	
Education and Outreach	Utilize education and outreach activities to target high growth areas to increase awareness of growth and development on water quality.
Water Quality Monitoring	Implement water quality monitoring activities to establish water quality trend data in high growth areas.
Plan Development, Coordination and Compliance	Provide tools for managing growth and development in a manner that is least harmful to water quality.
Sedimentation	Provide tools and mechanisms for development practices that decrease the potential for sedimentation.
Urban Management Practices	Provide tools and mechanisms for managing growth and development in a manner that has the least short and long-term impact on water quality.
Pollution Prevention and Nuisance Violations	Provide alternatives for common growth and development activities that decrease the potential for nonpoint source pollution.
Stream Remediation and Protection	Identify and publicize growth and development alternatives that can have a positive influence on the protection of local streams.

Agricultural Runoff

Agricultural runoff was identified as an issue in 12 watersheds that have a significant portion of the land in agricultural use, where animal densities are high, and/or where cropland sediment loads are higher than that of the overall cropland sediment of the Lower Coosa River Basin. Sources of nonpoint source pollution from agricultural activities may include overgrazing, plowing, pesticide spraying, irrigation, fertilizing, planting and harvesting. The major nonpoint source pollutants that might result from these activities, when best management practices are not implemented, are sediment, nutrients, pathogens, pesticides, and salts.

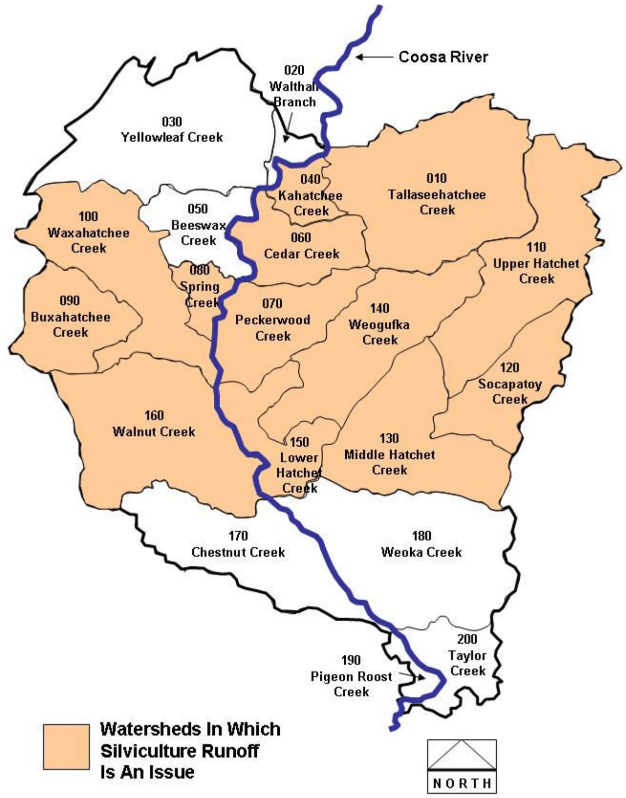


Strategies

Education and Outreach	Utilize education and outreach activities to target agricultural communities areas to increase awareness of agricultural nonpoint source potential and its affects on water quality.
Water Quality Monitoring	Implement water quality monitoring activities to establish water quality trend data in agricultural areas.
Sedimentation	Provide tools and mechanisms for agricultural practices that decrease the potential for sedimentation.
Pollution Prevention and Nuisance Violations	Provide alternatives for common agricultural activities that decrease the potential for nonpoint source pollution.
Stream Remediation and Protection	Identify and publicize agricultural alternatives that can have a positive influence on the protection of local streams.

Silviculture Runoff

Silviculture is the cultivation and harvesting of forest land, generally for timber purposes. Runoff from silviculture was cited as an issue in 13 of the 20 watersheds, located in the central and northeastern parts of the Lower Coosa River Basin. Silviculture runoff was identified in those watersheds that have a high potential for silviculture and/or where woodland sediment loads are higher than the overall woodland sediment load for the Lower Coosa River Basin, at 0.41 tons per acre. Sources of nonpoint source runoff associated with the practice of silviculture, if best management practices are not implemented, can include the removal of streamside vegetation leading to thermal pollution and sedimentation, due to road construction and maintenance, timber harvesting, and mechanical preparation for the planting of trees.

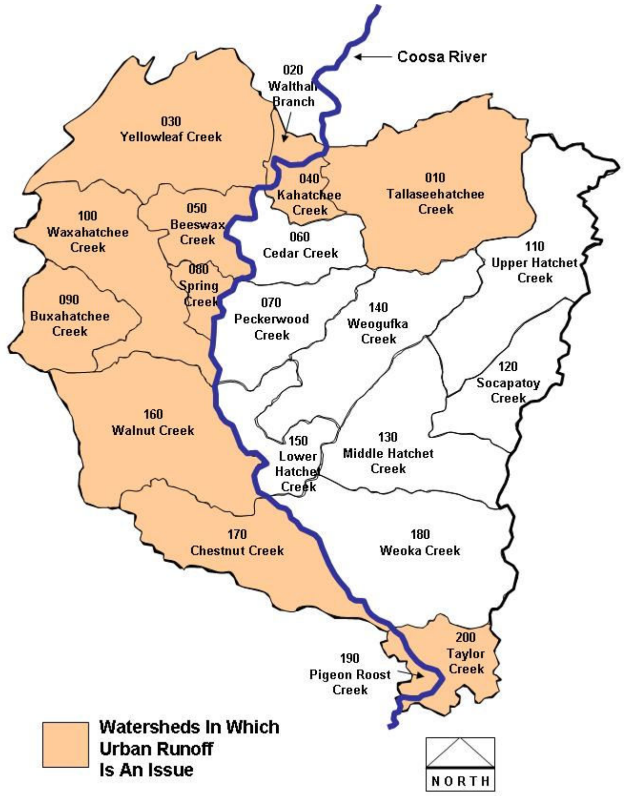


Strategies

Education and Outreach	Utilize education and outreach activities to target silviculture organizations and forest landowners to increase awareness of nonpoint source pollution potential in silviculture practices and its affects on water quality.
Water Quality Monitoring	Implement water quality monitoring activities to establish water quality trend data in silviculture areas.
Sedimentation	Provide tools and mechanisms for silviculture practices that decrease the potential for sedimentation.
Pollution Prevention and Nuisance Violations	Provide alternatives for silviculture activities that decrease the potential for nonpoint source pollution.
Stream Remediation and Protection	Identify and publicize methodologies that can have a positive influence on the protection of local streams duringsilviculture practices.

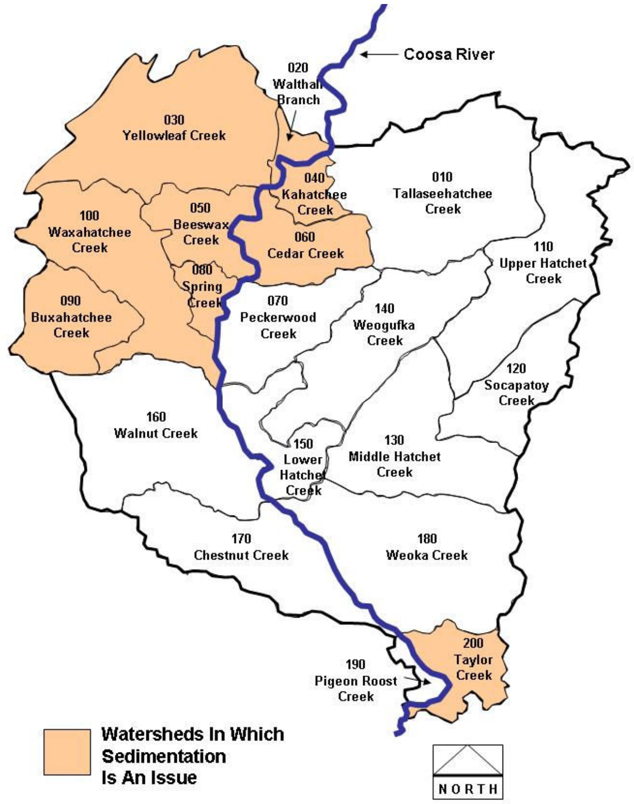
Urban Runoff

Urban runoff is an issue in 12 watersheds, located west of the Coosa River and in the northernmost and southernmost parts of the basin east of the Coosa River. Urban runoff was identified in those watersheds that have a percentage of the total land in urban land uses and/or where urban sediment loads are higher than the overall urban sediment load for the Lower Coosa River Basin, at 2.13 tons per acre. The more rapid rate of stormwater runoff due to the increase of impervious surfaces in urban areas can erode streambanks, cause scouring of streambeds, damage streamside vegetation and widen stream channels. In addition, urbanization also increases thermal pollution, and the variety and amount of pollutants transported to receiving waters, including sediment, chemicals, nutrients, pesticides and bacteria.



Strategies	
Education and Outreach	Utilize education and outreach activities to target high growth areas to increase awareness of growth and development on water quality.
Water Quality Monitoring	Implement water quality monitoring activities to establish water quality trend data in high growth areas.
Plan Development, Coordination and Compliance	Provide tools for managing growth and development in a manner that is least harmful to water quality.
Sedimentation	Provide tools and mechanisms for development practices that decrease the potential for sedimentation.
Urban Management Practices	Provide tools and mechanisms for managing growth and development in a manner that has the least short and long-term impact on water quality.
Pollution Prevention and Nuisance Violations	Provide alternatives for common growth and development activities that decrease the potential for nonpoint source pollution.
Stream Remediation and Protection	Identify and publicize growth and development alternatives that can have a positive influence on the protection of local streams.

Sedimentation



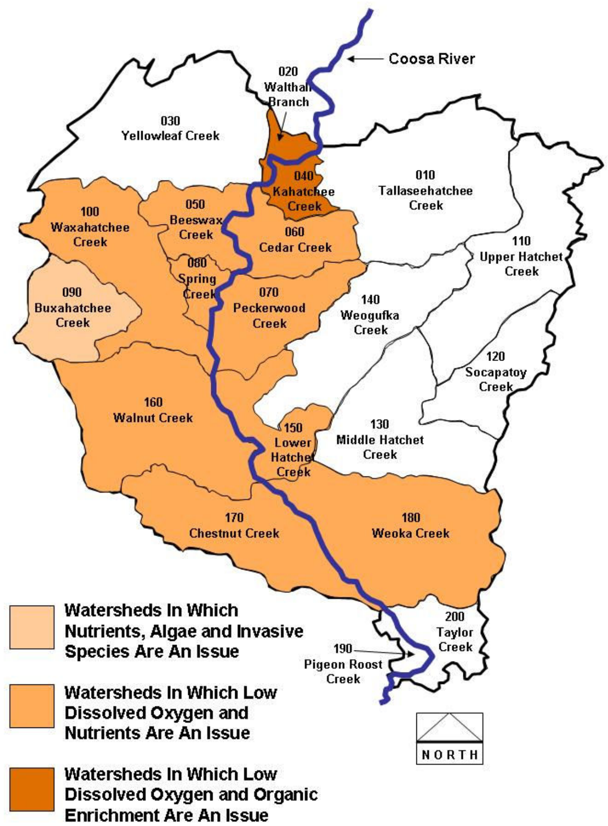
Sedimentation is a regional issue affecting nine watersheds, eight of which are located in the northwest part of the Lower Coosa River Basin. Only the Taylor Creek watershed is located in the southern part of the basin. Sedimentation was identified as an issue in those watersheds where the total sediment load, regardless of type, was higher than the overall sediment load for the basin, which is 4.28 tons per acre. Soil erosion is one of the major contributors to nonpoint source pollution, with primary sources, or causes, being land disturbances from construction, urbanization, farming and forestry. Increased soil erosion causes an increase in sediment loads beyond a stream's natural carrying capacity, resulting in streambank erosion, smoothing, eroding or incising of the streambed, and unnatural channel changes.

Strategies	
Education and Outreach	Utilize education and outreach activities to increase awareness of erosion and sedimentation on water quality and aquatic habitat.
Water Quality Monitoring	Implement water quality monitoring activities to establish water quality trends and visual assessment information.
Plan Development, Coordination and Compliance	Provide tools to local governments enabling them to manage stormwater runoff in a manner that is least harmful to water quality.
Sedimentation	Provide tools and mechanisms that decrease the potential for erosion and sedimentation.
Pollution Prevention and Nuisance Violations	Identify common sources of sedimentation and provide alternatives actions that decrease the potential for nonpoint source pollution and sedimentation.

Nutrients

- **Low Dissolved Oxygen**
- **Organic Enrichment**

Nutrients are compounds that stimulate plant growth, like nitrogen and phosphorus, that in high concentration can become an environmental and health threat. High nutrient levels can negatively affect dissolved oxygen levels necessary for healthy aquatic plant and animal communities. Nutrients were identified as a regional issue affecting ten watersheds primarily around the three reservoirs in the basin and low dissolved oxygen was identified as a regional issue affecting 11 watersheds around the reservoirs. High nutrient levels, low dissolved oxygen and organic enrichment were all identified in the 2004 Draft Section 303(d) list as water quality source problems. Primary sources of nutrients are runoff from municipal sewer systems, failing septic systems, fertilizers, leaves, animal waste and urban runoff.

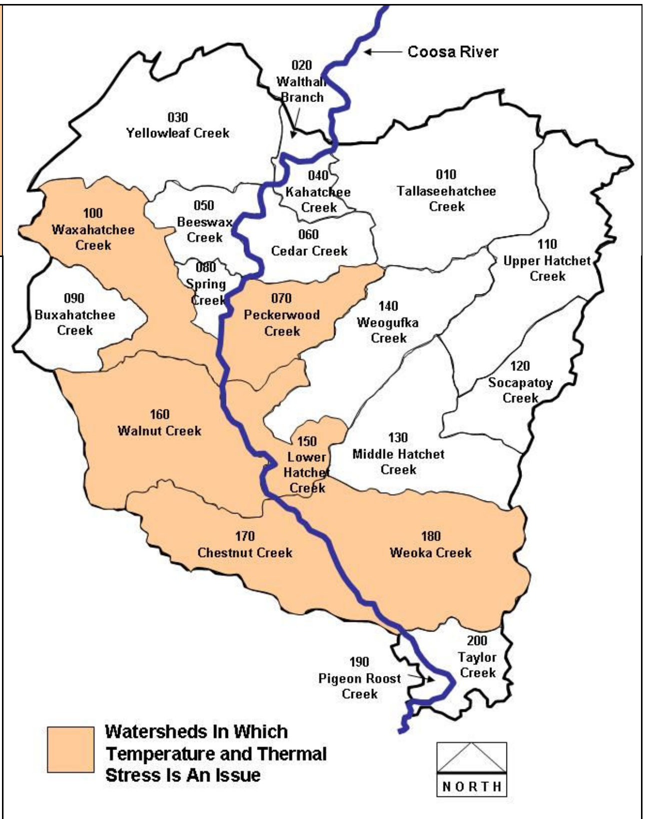


Strategies

Education and Outreach	Utilize education and outreach activities to increase awareness of nutrient sources and their impact on water quality.
Water Quality Monitoring	Implement water quality monitoring activities to establish water quality trends with emphasis on identified problem areas.
Plan Development, Coordination and Compliance	Provide tools for identifying and managing potential nutrient sources in a manner that is least harmful to water quality.
Pollution Prevention and Nuisance Violations	Identify nutrient sources impacting water quality and develop reasonable and achievable remedies.

Temperature and Thermal Stress

Thermal stress is a result of fluctuation in water temperature that can affect aquatic habitat even in the absence of other pollution. Temperature affects the ability of water to hold oxygen, as well as the ability of organisms to resist certain pollutants. Thermal stress was identified as a regional issue in six watersheds along the central and southern parts of the main stem of the Coosa River. Sources, or causes, of thermal stress may include point source discharges, pervious surfaces and the removal of vegetation along stream banks.



Strategies

Education and Outreach	Utilize education and outreach activities to increase awareness of temperature as a gage water quality and the impact of thermal stress.
Water Quality Management	Implement water quality monitoring activities to establish water quality trend data.
Pollution Prevention and Nuisance Violations	Provide alternatives for activities that increase thermal stress and increase water temperatures.

Education and Awareness Protection Measures

Status	Education and Awareness Tasks	Issue												Responsibility						Who
		ES Endangered Species	WQ Lack of Water Quality Trend Data	ID Illegal Dumping	E/A Lack of Education/Awareness	GR Growth Rate / Urban Development	AR Agricultural Runoff	SR Silviculture Runoff	UR Urban Runoff	S Sedimentation	N Nutrients	T Temperature / Thermal Stress	MR Mining Runoff	Ind Individuals	Org Organizations	Mun Municipalities	Cty Counties	State State	Fed Federal	
	Create task forces to implement education and outreach tasks outlined in the “Lack of Education and Awareness” protection measures targeting each of the issues identified in the Lower Coosa River Basin Management Plan.	X			X	X	X	X	X	X	X	X	X		X	X	X			LCRB SC LCRB EC RPCs Local Govts
	Establish an Education and Outreach Committee within the Lower Coosa River Basin Steering Committee organization to coordinate and implement basinwide educational activities that incorporate water quality monitoring.	X	X		X										X					LCRB SC HOBOs AWW
	Work with existing programs and organizations to develop and present a Lower Coosa River Basin – based nonpoint source education program for all land uses addressing each of the issues identified in the Lower Coosa River Basin Management Plan.	X		X	X	X	X	X	X	X	X	X	X		X		X	X		ACWP LCRB SC LCRB EC Interest Groups RPCs

Status	Education and Awareness Tasks	Issue												Responsibility						Who
		ES	WQ	ID	E/A	GR	AR	SR	UR	S	N	T	MR	Ind	Org	Mun	Cty	State	Fed	
	Work with existing programs to present a nonpoint source education program and brochure for contractors that addresses best management practices.				X	X			X	X					X	X		X		LCRB EC NEMO ACWP HBAA Local Govts RPCs
	Work with existing programs to present a nonpoint source education program and brochure for agricultural communities that addresses best management practices.						X								X		X	X	X	ADEM ACWP LCRB SC SWCDs ACES, NRCS
	Work with forestry industry to conduct forestry BMP workshops and seminars for loggers and both corporate and individual landowners.							X						X	X			X		LCRB EC AFC, AFA APPCo
	Develop partnerships with mining operations to increase awareness of sedimentation issues related to mining activities.												X	X	X					LCRB SC Mining Operations
	Form partnerships to educate businesses and industries about activities that cause pollution.				X										X	X	X	X		LCRB SC ACWP ADEM Chambers of Commerce
	Create a series of nonpoint source education brochures specifically based on the issues of the Lower Coosa River Basin for commercial developments and owners, for industrial developments and owners and for residential land uses that can be used in all watersheds in the Lower Coosa River Basin.				X	X			X						X	X		X		ADEM ACWP LCRB EC Local Govts RPCs
	Target densely populated areas with distribution of a nonpoint source education brochure for residential land uses.				X	X			X						X					LCRB SC LCRB EC

Status	Education and Awareness Tasks	Issue												Responsibility						Who
		ES	WQ	ID	E/A	GR	AR	SR	UR	S	N	T	MR	Ind	Org	Mun	Cty	State	Fed	
	Create a task force to perform on-site inspections for business and industrial partners to identify sources of runoff, pollution (including thermal) and sediment. Propose and discuss options to reduce negative impacts.					X			X					X	X	X				LCRB SC LCRB EC Interest Groups Local Govts Citizens
	Coordinate with local agricultural organizations to present a Lower Coosa River Basin based nonpoint source education program, emphasizing the local and regional impacts of agricultural runoff and nonpoint source potential.						X								X		X	X	X	LCRB SC LCRB EC ALFA, SWCDs ACES NRCS
	Coordinate with state and local forestry organizations to present a Lower Coosa River Basin based nonpoint source education program, emphasizing the local and regional impacts of silviculture runoff and nonpoint source potential.							X							X			X		LCRB EC Timber Companies AFC, AFA APPCo
	Arrange presentations of a Lower Coosa River Basin based nonpoint source education program to elected officials and citizens, emphasizing the local and regional impacts of growth and development.				X	X			X						X					LCRB SC LCRB EC
	Promote Alabama Water Watch training and monitoring activities as a simple way to address water quality monitoring needs.		X		X									X	X			X		LCRB SC LCRB EC AWW, ACWP HOBOs
	Designate an individual responsible for compiling water quality monitoring results from the Alabama Water Watch website for the Lower Coosa River Basin. Make information available through the Lower Coosa River Basin website and regular updates to committees and HOBO associations.		X		X									X	X					LCRB EC AWW HOBOs
	Develop an annual press release on water quality trends in the Lower Coosa River Basin that can be distributed in meetings and incorporated into news articles and organizational newsletters.		X		X										X					LCRB EC HOBOs

Status	Education and Awareness Tasks	Issue												Responsibility						Who
		ES	WQ	ID	E/A	GR	AR	SR	UR	S	N	T	MR	Ind	Org	Mun	Cty	State	Fed	
	Recognize municipalities and other organizations for participation in on-going water quality monitoring activities in the Lower Coosa River Basin.		X		X										X			X		AWW ACWP ADEM
	Develop partnerships and cooperative stakeholder associations to increase awareness of endangered species and critical habitat issues with a goal of protecting and conserving identified species.	X			X									X	X	X	X	X	X	USFWS ADEM ACWP LCRB SC Interest Groups RPCs
	Produce informational material defining illegal dumping, outlining penalties and providing local alternatives for the disposal of trash.			X	X										X		X	X		LCRB EC ADEM Local Gov'ts HOBOs
	Include illegal dumping as a nuisance violation in all watershed informational material.			X	X										X					Coosa CWP LCRB SC LCRB EC
	Initiate "adopt a stream" programs to regularly monitor and clean minor and moderate waterways.				X		X	X		X				X	X	X	X	X		LCRB EC, PALS Interest Groups Citizens
	Initiate storm drain stenciling program to remind residents that storm drains are not for disposal, but flow to freshwater streams and rivers.				X						X	X			X	X				LCRB EC Local Gov'ts Non Profits AWW, HOBOs
	Support anti-litter organizational programs and efforts to educate citizens about illegal dumping and littering.			X	X										X					LCRB SC LCRB EC APCO
	Work with appropriate agencies to promote, encourage participation in, and recognize participation in the TREASURE Forest and Tree Farm programs to increasingly foster strong forest land stewardship.				X			X							X		X	X		ADEM ACWP LCRB SC SWCD, ACES AFA APPCo

Water Quality Monitoring Protection Measures

Status	Water Quality Monitoring Tasks	ES Endangered Species	WQ Lack of Water Quality Trend Data	ID Illegal Dumping	E/A Lack of Education/Awareness	GR Growth Rate / Urban Development	AR Agricultural Runoff	SR Silviculture Runoff	UR Urban Runoff	S Sedimentation	N Nutrients	T Temperature / Thermal Stress	MR Mining Runoff	Ind Individuals	Org Organizations	Mun Municipalities	Cty Counties	State State	Fed Federal	Who
	Support and encourage the continued funding of state and federal water quality monitoring activities that include habitat identification and assessment.	X												X	X	X	X	X	X	USFWS USGS ADCNR ADEM LCRB SC Interest Groups
	Work with the Education and Outreach Committee of the Lower Coosa River Basin Steering Committee organization to coordinate and implement a basinwide water quality monitoring plan.	X	X		X										X					LCRB SC HOBOs AWW
	Promote Alabama Water Watch training and monitoring activities as a simple way to address water quality monitoring needs.		X		X									X	X			X		LCRB SC LCRB EC AWW ACWP HOBOs

Status	Water Quality Monitoring Tasks	Issue												Responsibility						Who
		ES	WQ	ID	E/A	GR	AR	SR	UR	S	N	T	MR	Ind	Org	Mun	Cty	State	Fed	
	Designate an individual responsible for compiling water quality monitoring results from the Alabama Water Watch website for the Lower Coosa River Basin and make this information available through the Lower Coosa River Basin website and regular updates to committees and home owner and boat owner associations.		X		X									X	X					LCRB EC AWW HOBOs
	Develop an annual press release on water quality trends in the Lower Coosa River Basin that can be distributed in meetings and incorporated into news articles and organizational newsletters.		X		X										X					LCRB EC HOBOs
	Establish a recognition program for participation in on-going water quality monitoring activities in the Lower Coosa River Basin.		X		X										X			X		AWW, ACWP LCRB EC ADEM
	Coordinate with the Lake Jordan HOBO to establish a local watershed water quality monitoring group in the Chestnut Creek watershed for support, backup and comparison purposes and to increase monitoring to include and additional two lake sites and six stream sites.		X		X									X	X					LCRB SC LCRB EC AWW HOBO
	Coordinate with the Lake Mitchell HOBO to establish a local watershed water quality monitoring group in the Lower Hatchet Creek watershed for support, backup and comparison purposes and to increase monitoring to include an additional two lake sites and three stream sites.		X		X									X	X					LCRB SC LCRB EC AWW HOBO
	Coordinate with the Lake Mitchell HOBO to establish a local watershed water quality monitoring group in the Walnlut Creek watershed for support, backup and comparison purposes and to increase monitoring to include an additional two lake sites and four stream sites.		X		X									X	X					LCRB SC LCRB EC AWW HOBO

Status	Water Quality Monitoring Tasks		Issue													Responsibility						Who
			ES	WQ	ID	E/A	GR	AR	SR	UR	S	N	T	MR		Ind	Org	Mun	Cty	State	Fed	
	Coordinate with the Lay Lake HOBO to establish a local watershed water quality monitoring group in the Beeswax Creek watershed for support, backup and comparison purposes and to increase monitoring to include four stream sites.			X		X										X	X					LCRB SC LCRB EC AWW HOBO
	Coordinate with the Lay Lake HOBO to establish a local watershed water quality monitoring group in the Cedar Creek watershed for support, backup and comparison purposes and to increase monitoring to include four stream sites.			X		X										X	X					LCRB SC LCRB EC AWW HOBO
	Coordinate with the SOULS Water Watch to strengthen the local watershed water quality monitoring group in the Weoka Creek watershed for support, backup and comparison purposes and to increase monitoring to include four lake sites and an additional four stream sites.			X		X										X	X					LCRB SC LCRB EC AWW
	Establish a local watershed water quality monitoring group in the Walthall Branch watershed for support, backup and comparison purposes with monitoring conducted at one stream site and one lake site.			X		X										X	X					LCRB SC LCRB EC AWW HOBO
	Establish a local watershed water quality monitoring group in the Yellowleaf Creek watershed for support, backup and comparison purposes with monitoring conducted at 11 stream sites and one lake site.			X		X										X	X					LCRB SC LCRB EC AWW HOBO
	Establish a local watershed water quality monitoring group in the Kahatchee Creek watershed for support, backup and comparison purposes with monitoring conducted at two stream sites and two lake sites.			X		X										X	X					LCRB SC LCRB EC AWW HOBO

Status	Water Quality Monitoring Tasks		Issue													Responsibility						Who
			ES	WQ	ID	E/A	GR	AR	SR	UR	S	N	T	MR		Ind	Org	Mun	Cty	State	Fed	
	Establish a local watershed water quality monitoring group in the Peckerwood Creek watershed for support, backup and comparison purposes with monitoring conducted at four stream sites and two lake sites.			X		X										X	X					LCRB SC LCRB EC AWW HOBO
	Establish a local watershed water quality monitoring group in the Spring Creek watershed for support, backup and comparison purposes with monitoring conducted at two stream sites and two lake sites.			X		X										X	X					LCRB SC LCRB EC AWW HOBO
	Establish a local watershed water quality monitoring group in the Buxahatchee Creek watershed for support, backup and comparison purposes with monitoring conducted at four stream sites.			X		X										X	X					LCRB SC LCRB EC AWW HOBO
	Establish a local watershed water quality monitoring group in the Waxahatchee Creek watershed for support, backup and comparison purposes with monitoring conducted at six stream sites and two lake sites.			X		X										X	X					LCRB SC LCRB EC AWW HOBO
	Establish a local watershed water quality monitoring group in the Upper Hatchet Creek watershed for support, backup and comparison purposes with monitoring conducted at ten stream and tributary sites.			X		X										X	X					LCRB SC LCRB EC AWW HOBO
	Establish a local watershed water quality monitoring group in the Socapatoy Creek watershed for support, backup and comparison purposes with monitoring conducted at five stream sites.			X		X										X	X					LCRB SC LCRB EC AWW HOBO

Status	Water Quality Monitoring Tasks	Issue												Responsibility						Who
		ES	WQ	ID	E/A	GR	AR	SR	UR	S	N	T	MR	Ind	Org	Mun	Cty	State	Fed	
	Establish a local watershed water quality monitoring group in the Middle Hatchet Creek watershed for support, backup and comparison purposes with monitoring conducted at eight stream sites.		X		X									X	X					LCRB SC LCRB EC AWW HOBO
	Establish a local watershed water quality monitoring group in the Weogufka Creek watershed for support, backup and comparison purposes with monitoring conducted at eight stream sites.		X		X									X	X					LCRB SC LCRB EC AWW HOBO
	Establish a local watershed water quality monitoring group in the Pigeon Roost Creek watershed for support, backup and comparison purposes with monitoring conducted at three river sites and two stream sites		X		X									X	X					LCRB SC LCRB EC AWW HOBO
	Establish a local watershed water quality monitoring group in the Taylor Creek watershed for support, backup and comparison purposes with monitoring conducted at three river sites and three stream sites.		X		X									X	X					LCRB SC LCRB EC AWW HOBO
	Establish a water quality monitoring group in the Tallassehatchee Creek watershed for support, backup and comparison purposes with monitoring conducted at 12 stream sites.		X		X									X	X					LCRB SC LCRB EC AWW HOBO
	Implement water quality monitoring plan for each watershed and utilize data to establish water quality trend data, enabling the early detection of water quality problems with particular emphasis on nutrients, sedimentation and water temperature to augment efforts to address these issues throughout the basin.									X	X	X	X	X	X	X	X			LCRB SC ACWP AWW Citizens

Status	Water Quality Monitoring Tasks	Issue												Responsibility						Who
		ES	WQ	ID	E/A	GR	AR	SR	UR	S	N	T	MR	Ind	Org	Mun	Cty	State	Fed	
	Target agricultural areas in the implementation of local watershed water quality monitoring programs to establish water quality trend data, with particular focus on ratings for nonpoint source potential.						X							X	X	X	X			LCRB SC AWW, SWCD ACES Citizens
	Target habitat areas in the implementation of local watershed water quality monitoring programs to establish water quality trend data, with particular focus on habitat assessment.	X													X	X	X	X	X	USFWS ADCNR ADEM, AWW LCRB SC Local Gov'ts Academia
	Target high growth areas in the implementation of local watershed water quality monitoring programs to establish water quality trend data, with particular focus on pre and post development monitoring results.					X			X						X	X	X			LCRB SC AWW Local Gov'ts RPCs
	Target silviculture areas in the implementation of local watershed water quality monitoring programs to establish water quality trend data, with particular focus on ratings for nonpoint source potential.							X						X	X	X	X			LCRB SC AWW AFA APPCo Citizens
	Work with Alabama Water Watch to encourage citizen training in visual stream assessments to encourage participation of those not interested in water quality monitoring and initiate a visual assessment database and tracking system.									X			X	X	X	X	X			LCRB EC ACWP AWW ADEM
	Conduct county by county inventory of illegal dumps, classifying them by types of materials disposed.			X											X	X	X	X		ADEM, ADPH, Local Gov'ts, LCRB EC, Citizens
	Maintain database of illegal dumps and their clean up status to establish trends in types of materials dumped and most frequent locations.			X											X			X		ADEM, LCRB EC, ADCNR ADPH, SWCD

Plan Development, Coordination and Compliance Protection Measures

Status	Plan Development, Coordination and Compliance Tasks	Issue: ES Endangered Species	WQ Lack of Water Quality Trend Data	ID Illegal Dumping	E/A Lack of Education/Awareness	GR Growth Rate / Urban Development	AR Agricultural Runoff	SR Silviculture Runoff	UR Urban Runoff	S Sedimentation	N Nutrients	T Temperature / Thermal Stress	MR Mining Runoff	Responsibility: Ind Individuals	Org Organizations	Mun Municipalities	Cty Counties	State State	Fed Federal	Who
	Adopt an on-going water quality monitoring plan requiring frequent periodic review of water quality monitoring results for trend analysis and early detection of problem areas.		X												X					LCRB SC HOBOs
	Conduct an analysis between relevant endangered species recovery plans that pertain to the Lower Coosa River Basin and compile a summary document to address as many issues and species protection as possible in a comprehensive manner.	X													X			X	X	USFWS ADCNR ADEM ACWP LCRB SC Interest Groups
	Coordinate and promote activities that are in compliance with restoration strategies outlined in the Recovery Plan for the Mobile River Basin Aquatic Ecosystem.	X													X			X	X	USFWS ADCNR ADEM, ACWP LCRB SC Interest Groups

Status	Plan Development, Coordination and Compliance Tasks	Issue												Responsibility						Who
		ES	WQ	ID	E/A	GR	AR	SR	UR	S	N	T	MR	Ind	Org	Mun	Cty	State	Fed	
	Encourage local governments to reduce the quantity of runoff by reviewing, and modifying when necessary, Zoning Ordinances to reduce paved parking area requirements. Install paved areas for heavily used parking and pervious surfaces for overflow parking.									X				X	X	X				LCRB SC NEMO Local Govts RPCs
	Encourage local governments to manage pollution, sediment and stormwater runoff by amending or preparing and adopting "public works manuals" addressing procedures and standards related to nonpoint pollution.					X			X	X				X	X	X	X			LCRB SC Local Govts NEMO HBAA RPCs
	Encourage local governments to manage stormwater runoff by amending or preparing and adopting subdivision regulation provisions addressing drainage, retention and settling basin and discharge requirements.					X			X	X				X	X	X	X			LCRB SC Local Govts NEMO RPCs
	Encourage local governments to manage the installation of impervious surfaces, regardless of land use, to reduce the quantity of runoff by modifying all district regulations in municipal Zoning Ordinances.					X			X	X				X	X	X				LCRB SC NEMO Local Govts RPCs
	Manage nutrient and pathogen loads by performing routine inspections of densely populated areas using septic systems.										X						X			County Health Depts
	Manage nutrient and pathogen loads by preparing management plans to address sewage plant overflows and utility service interruptions such as power outages.					X			X							X	X	X		Local Govts ADEM Local Utilities
	Manage nutrient and pathogen loads from septic systems by performing routine inspections of moderately populated areas that are located in close proximity to waterways and lakes.										X						X			County Health Depts HOBOs

Status	Plan Development, Coordination and Compliance Tasks	Issue												Responsibility						Who
		ES	WQ	ID	E/A	GR	AR	SR	UR	S	N	T	MR	Ind	Org	Mun	Cty	State	Fed	
	Manage stormwater runoff in watershed areas by segmenting the watershed to control peak runoff by varying the detention time according to segment.					X			X						X	X	X			Local Gov'ts NEMO RPCs
	Manage stormwater runoff to prevent flooding by enforcing the provisions of local flood prevention ordinances, especially provisions regarding encroachment and construction in the floodplain or flood fringe.					X			X						X	X	X			Local Gov'ts NEMO RPCs
	Prevent erosion and pollution by revising city and county subdivision regulations to require settlement ponds, holding basins and establishing discharge rates.					X			X	X					X	X	X			Local Gov'ts HBAA NEMO RPCs
	Support Alabama Water Watch efforts to produce local publications with water quality monitoring results.		X											X	X					ACWP LCRB SC AWW HOBOs
	Using existing databases as starting point, inventory and geographically reference wetlands, threatened and endangered species, critical area, and habitats throughout the Lower Coosa River Basin	X													X			X	X	ADEM ACWP ADCNR TNC LCRB SC COE

Sedimentation Protection Measures

Status	Sedimention Tasks	Issue: ES Endangered Species	WQ Lack of Water Quality Trend Data	ID Illegal Dumping	E/A Lack of Education/Awareness	GR Growth Rate / Urban Development	AR Agricultural Runoff	SR Silviculture Runoff	UR Urban Runoff	S Sedimentation	N Nutrients	T Temperature / Thermal Stress	MR Mining Runoff	Responsbility: Ind Individuals	Org Organizations	Mun Municipalities	Cty Counties	State State	Fed Federal	Who
	Decrease erosion and sedimentation by minimizing land disturbance activities and by not leaving dirt exposed.				X									X						Citizens
	Encourage implementation of mining BMPs for both active and closed mines.												X	X	X					ACWP, LCRB SC, Citizens
	Encourage landowners to voluntarily install best management practices according to the *Alabama Best Management Practices Manual for Forestry*.							X						X	X					LCRB EC Landowners AFA APPCo
	Encourage reclamation incentives, including reclamation on public lands to increase recreation potential on reclaimed lands.												X		X	X	X	X		ADEM, ACWP, Local Govts
	Manage agricultural erosion by instituting no-till, terrace and other similar crop / land "best management practices".						X							X	X				X	SWCDs Farmers NRCS

Status	Sedimentation Tasks	Issue												Responsibility						Who
		ES	WQ	ID	E/A	GR	AR	SR	UR	S	N	T	MR	Ind	Org	Mun	Cty	State	Fed	
	Manage sediment loads by treating unpaved roads with a porous all weather surface.					X			X							X	X			Local Govts
	Manage thermal pollution and stabilize stream banks by planting or replanting trees in open areas along waterways.				X									X	X	X	X	X	X	Citizens Local Govts NRCS SWCDs
	Minimize forestry erosion and sedimentation by ensuring that forestry BMPs are implemented in the construction and use of logging roads, especially mandatory BMPs for stream crossings and wetlands, including requirements for size and slope of road, distance from streams, and minimal vegetative disturbance.							X						X	X		X	X		LCRB SC ADEM, AFC, AFA, APPCo, Timber Companies, Landowners
	Minimize impervious surface by controlling the width and length of new paved roads.									X					X	X	X			LCRB SC Local Govts
	Park vehicles on a lawn area or other vegetated surface when cleaning to decrease nutrient, and toxic runoff, thermal pollution and minimize sediment.				X									X						Citizens
	Prevent agricultural erosion and sedimentation by using agricultural best management practices.						X							X	X				X	SWCDs NRCS Farmers
	Prevent agricultural erosion and sedimentation by using agricultural best management practices.									X				X	X					SWCD ACES ALFA
	Prevent erosion and pollution by requiring vegetated settlement ponds for subdivision and neighborhood drainage systems prior to discharge into natural stream system.					X			X	X						X	X			Local Gov'ts
	Prevent erosion and sediment and the introduction of additional impervious surfaces by paving unpaved roads with porous material.					X			X	X						X	X			Local Gov'ts

Status	Sedimentation Tasks	Issue												Responsibility						Who
		ES	WQ	ID	E/A	GR	AR	SR	UR	S	N	T	MR	Ind	Org	Mun	Cty	State	Fed	
	Prevent erosion and sediment by requiring vegetated buffer areas adjacent to parking lots to filter runoff prior to discharging to either a man-made drainage system or natural stream network..					X										X	X			Local Gov'ts
	Prevent erosion and sediment by requiring vegetated buffer areas adjacent to parking lots to filter runoff prior to discharging to either a man-made drainage system or natural stream network..								X	X					X	X	X			LCRB SC Interest Groups Local Govts
	Prevent erosion and sediment by using vegetated road shoulders and drainage swales instead of curb and gutter to filter street runoff.					X			X	X						X	X			LCRB SC Interest Groups Local Govts
	Prevent erosion and sediment caused by construction by requiring sodding of first 25 feet of property adjacent to perennial drainage stream.				X	X			X	X				X	X	X	X			LCRB SC Local Govts HBAA Contractors NEMO, NRCS SWCDs, AFC
	Prevent forestry erosion and control by implementing silviculture best management practices.							X							X					AFA APPCo Landowners
	Prevent forestry erosion and sedimentation by implementing forestry best management practices.									X				X	X					AFA, Timber Companies, Landowners
	Prevent urban and rural erosion and sediment on road construction projects by using best management practices.					X			X	X						X	X	X		ALDOT ADEM Local Gov'ts
	Prevent urban erosion and sedimentation by employing construction best management practices.					X			X	X				X	X	X	X			Contractors HBAA, Local Govts, Citizens

Status	Sedimentation Tasks		Issues													Responsibility						Who
			ES	WQ	ID	E/A	GR	AR	SR	UR	S	N	T	MR		Ind	Org	Mun	Cty	State	Fed	
	Reduce stormwater runoff quantity and pollution by providing vegetated buffers that separate areas of impervious surfaces and between impervious surfaces and discharges to either man-made drainage systems or natural stream networks.										X						X	X				LCRB SC Interest Groups Local Govts
	Support initiatives that utilize technical innovations to reduce nonpoint source pollution and sedimentation such as constructed wetlands and bio-remediation.													X		X	X			X		LCRB SC, Interest Groups, Academia

Urban Management Practices
Protection Measures

Status	Urban Management Practices	Issue: ES Endangered Species	WQ Lack of Water Quality Trend Data	ID Illegal Dumping	E/A Lack of Education/Awareness	GR Growth Rate / Urban Development	AR Agricultural Runoff	SR Silviculture Runoff	UR Urban Runoff	S Sedimentation	N Nutrients	T Temperature / Thermal Stress	MR Mining Runoff	Responsibility: Ind Individuals	Org Organizations	Mun Municipalities	Cty Counties	State State	Fed Federal	Who
	Collect and properly dispose of road litter.					X								X	X	X	X	X		Citizens ALDOT Local Govts
	Collect and properly dispose of road trash from bridges rather than discarding debris in stream.								X						X	X	X	X		ALDOT
	Control thermal pollution in detention and settling basins by planting trees along the edge and on internal buffers.					X			X					X	X	X	X			LCRB EC Citizens Local Govts
	Develop sample stormwater management guidelines for municipalities and counties that include on-going water quality management as an integral part of the local stormwater management process.		X												X	X	X	X		ADEM, ACWP, Local Gov'ts

Status	Urban Management Practices		Issue													Responsibility						Who
			ES	WQ	ID	E/A	GR	AR	SR	UR	S	N	T	MR		Ind	Org	Mun	Cty	State	Fed	
	Encourage cities and counties in the Lower Coosa River Basin to adopt stormwater management plans and participate in water quality monitoring as a part of their stormwater management process.			X													X	X	X			LCRB SC
	Manage contaminants causing pollution by regularly cleaning up debris; especially from parking areas.									X						X		X				Local Govts Developers
	Manage nutrient and pathogen loads by performing routine inspections of densely populated areas using septic systems.						X			X								X	X			County Health Depts Local Govts
	Manage nutrient and pathogen loads from septic systems by performing routine inspections of moderately populated areas that are located in close proximity to waterways and lakes.						X			X								X	X			Local Gov'ts County Health Depts.
	Manage pollution, sediment and stormwater runoff by amending or preparing and adopting "public works manuals" addressing procedures and standards related to nonpoint pollution.			X														X	X			Local Gov'ts
	Manage runoff and pollution from central business district parking areas, commercial shopping centers and strip commercial development parking areas, and industrial developments by requiring vegetated buffers between parking bays and around the edge of parking lots.						X									X		X	X			Local Govts Developers
	Manage runoff and pollution from central business district parking areas, commercial shopping centers and strip commercial development parking areas, and industrial developments by installing pervious paving.						X			x						X		X	X			Local Govts Developers

Status	Urban Management Practices	Issue												Responsibility						Who
		ES	WQ	ID	E/A	GR	AR	SR	UR	S	N	T	MR	Ind	Org	Mun	Cty	State	Fed	
	Manage runoff and pollution from commercial shopping, office parking areas and industrial developments by requiring vegetated medians between parking bays.					X			X					X		X	X			Local Govts Developers
	Manage runoff and pollution from commercial shopping centers and strip commercial development by limiting the amount of impervious surface.					X			X					X		X	X			Local Govts Developers
	Manage stormwater runoff by preserving natural areas in developments that enhance infiltration instead of runoff.					X			X					X		X	X			Local Gov'ts Contractors HBAA
	Manage the amount of runoff and pollution and sediment from commercial shopping centers, strip commercial development areas and industrial areas by providing detention and settlement ponds on the property.								X					X		X				Local Govts Developers
	Manage the amount of runoff and pollution from industrial development by providing vegetated buffers at the perimeter of the property.								X					X		X				Local Govts Developers
	Manage toxic pollution by providing impervious containment areas around chemical, fuel and other hazardous material storage areas to trap spills.					X			X							X	X	X		ADEM Local Gov'ts
	Managing nutrient, pathogen and toxic loads, thermal pollution and minimize sediment and quantity of stormwater runoff by requiring automated and self serve car washes to recycle water and retain runoff.								X							X	X			Local Govts
	Managing stormwater runoff pollution by requiring automated and self serve car washes to direct excess drainage to buffer strips around property.								X					X		X				Local Govts Developers

Status	Urban Management Practices	Issue												Responsibility						Who
		ES	WQ	ID	E/A	GR	AR	SR	UR	S	N	T	MR	Ind	Org	Mun	Cty	State	Fed	
	Minimize impervious surface by controlling the width and length of new paved roads.					X			X							X	X			Local Gov'ts
	Prevent nutrient and pathogen pollution sources by locating, to the extent practical, septic tanks and field lines in areas that can be easily monitored (e.g. front yards).								X					X		X		X		ADPH Local Govts Developers
	Protect against nutrient enrichment, pathogens and toxics caused by storm drainage by regular street sweeping of all roads with curb and gutter section.					X			X							X	X			Local Govt's
	Provide vegetated buffers that separate areas of impervious and pervious surfaces and discharges to man-made drainage systems or natural stream. networks.					X			X					X	X	X	X			Local Gov'ts HBAA Contractors
	Reduce stormwater runoff by requiring detention ponds, storage cisterns or other on-site water holding facilities.					X			X							X	X			Local Gov'ts
	Reduce stormwater runoff from individual developments by requiring that the rate of discharge not exceed the pre-development rate and allowing the discharge over longer periods of time.					X			X					X		X	X			Local Gov'ts Contractors

Pollution Prevention and Nuisance Violation Protection Measures

Status	Pollution Prevention and Nuisance Violation Tasks	ES Endangered Species	WQ Lack of Water Quality Trend Data	ID Illegal Dumping	E/A Lack of Education/Awareness	GR Growth Rate / Urban Development	AR Agricultural Runoff	SR Silviculture Runoff	UR Urban Runoff	S Sedimentation	N Nutrients	T Temperature / Thermal Stress	MR Mining Runoff	Ind Individuals	Org Organizations	Mun Municipalities	Cty Counties	State State	Fed Federal	Who
	Collect and properly dispose of road litter.			X		X					X			X	X	X	X	X		Citizens, PALS ALDOT Local Govts
	Avoid excessive impervious areas; especially near structures, drainage ways (including curb and gutter) and flowing streams.				X									X	X	X	X			Citizens Local Gov'ts RPCs
	Control thermal pollution in detention and settling basins by planting trees along the edge and on internal buffers.											X		X	X	X	X			LCRB SC Local Govts Developers
	Encourage forestry landowners to plan harvesting activities in advance to avoid negative impacts on water quality, to increase site productivity and to protect wildlife habitat.							X						X	X					LCRB EC AFA APPCo Landowners

Status	Pollution Prevention and Nuisance Violation Tasks	Issue: ES	WQ	ID	E/A	GR	AR	SR	UR	S	N	T	MR	Responsibility: Ind	Org	Mun	Cty	State	Fed	Who
	Establish and publicize a location for reporting septic system failure and drainage area clogging and congestion via a phone line or website.				X						X				X					LCRB SC ADPH
	Establish local Environmental Enforcement Programs within counties.	X		X	X	X	X	X	X	X	X	X	X					X		Local Govts
	Establish regular collection days and locations for larger items and chemicals to facilitate disposal of trash and waste by citizens.			X												X	X			Local Govts
	Initiate programs to identify and fine persons illegally dumping.			X											X	X	X	X		ADEM ADPH
	Manage agricultural runoff by retaining vegetated buffer strips on the downhill side of crop and pasture land and along streams.						X							X	X					Farmers SWCD ACES NRCS
	Manage contaminants causing pollution by regularly cleaning up debris; especially from parking areas.									X				X	X	X				LCRB SC Local Govts Citizens
	Manage groundwater pollution by identifying and capping inactive wells.				X	X	X		X		X			X	X	X	X	X		ADEM Local Govts Groudwater Foundation Citizens
	Manage nutrient loading (animal manure) by keeping the animal population per acre at or below the levels recommended for "best management practices".						X				X			X	X			X	X	ALFA NRCS SWCD ADEM Non Profits Citizens
	Manage nutrient loading (chicken litter and dead poultry) by distributing litter on land at appropriate rates and properly disposing of carcasses in accordance with "best management practices".						X				X			X	X			X	X	APEA, ALFA NRCS, SWCD ADEM Citizens

Status	Pollution Prevention and Nuisance Violation Tasks	Issue												Responsibility						Who
		ES	WQ	ID	E/A	GR	AR	SR	UR	S	N	T	MR	Ind	Org	Mun	Cty	State	Fed	
	Manage nutrient loading by keeping animals out of local streams.						X				X			X						SWCD, NRCS Farmers
	Manage nutrient loads by initiating composting centers to dispose of natural plant material and debris.				X	X			X		X			X	X	X	X			LCRB SC Local Govts Landfills Citizens
	Manage nutrient loads by maintaining clean drainage channels along public rights-of-way.				X	X			X		X			X		X	X	X		ALDOT Local Govts
	Manage nutrient loads by not piling debris from natural vegetation, such as plants, tree trimmings, leaf material and yard clippings in drainage swales, curbs and gutters or adjacent to streams.				X	X	X		X		X			X						Local Govts Citizens
	Manage stormwater runoff by preserving natural areas in developments that enhance infiltration instead of runoff.									X				X	X	X	X			LCRB SC Developers Local Govts
	Manage thermal pollution and stabilize stream banks by planting or replanting trees in open areas along waterways.				X							X		X	X	X	X			LCRB SC SWCD, NRCS RPCs
	Manage toxic loads by disposing of solvents and chemicals using approved methods.				X	X	X		X					X	X	X	X	X		ADEM, A&I Local Govts Citizens Organizations
	Manage toxic loads by maintaining a "hotline" to provide immediate advice regarding disposal of solvents and chemicals.				X	X	X		X									X		ADEM ADPH A&I
	Manage toxic loads by not disposing of paint in a liquid form. Open the paint container and allow the paint to dry or stir in kitty litter to solidify the liquid.				X	X			X					X	X					Contractors HBAA Citizens
	Managing nutrient and pathogen loads by maintaining septic tank and field lines to prevent sewage pollution.				X	X			X		X			X			X			County Health Depts Citizens

Status	Pollution Prevention and Nuisance Violation Tasks	Issue												Responsibility						Who
		ES	WQ	ID	E/A	GR	AR	SR	UR	S	N	T	MR	Ind	Org	Mun	Cty	State	Fed	
	Managing nutrient, pathogen and toxic loads by not applying fertilizers, herbicides or insecticides directly to waterbodies and leaving an untreated buffer area adjacent to waterbodies so the material is not washed into the stream with runoff.				X	X	X		X		X			X	X	X	X	X		State Facility Operators Local Govts Citizens HOBOs
	Managing nutrient, pathogen and toxic loads by not exceeding product application rates for fertilizers, herbicides and insecticides as given on product directions.				X	X	X		X		X			X						Citizens Contractors Facility Operators
	Managing nutrient, pathogen and toxic loads, thermal pollution and minimize sediment by not washing vehicles where run-off, including soap, other cleaning solvents and dirt, can wash into drainage ways. Park vehicles on a lawn area or other vegetated surface when cleaning.										X	X		X		X	X			Local Govts Citizens
	Managing nutrient, pathogen and toxic loads, thermal pollution and minimize sediment and quantity of stormwater runoff by requiring automated and self serve car washes to recycle water and retain runoff.										X	X		X		X				Local Govts Citizens
	Perform routine inspections of densely populated areas using septic systems and maintain a log of those areas with consistent problems.		X														X			County Health Depts
	Petition local law enforcement agencies to enforce State laws on criminal littering found in the *Code of Alabama,* Section 13A-7-29.			X											X	X	X			LCRB SC Local Gov'ts
	Prevent nutrient and pathogen pollution sources by locating, to the extent practical, septic tanks and field lines in areas that can be easily monitored (e.g. front yards).										X			X		X				Citizens, County Health Department

Status	Pollution Prevention and Nuisance Violation Tasks	Issue												Responsibility						Who
		ES	WQ	ID	E/A	GR	AR	SR	UR	S	N	T	MR	Ind	Org	Mun	Cty	State	Fed	
	Promote and support mandatory garbage collection programs.			X											X	X	X			LCRB SC Local Govts RPCs
	Promote utilization of forest chemicals such as herbicides, insecticides, fungicides and fertilizers sparingly and according to label instructions to minimize pollutant runoff into nearby streams.							X						X	X					LCRB SC AFA, APPCo Landowners
	Protect against nutrient enrichment, pathogens and toxics caused by storm drainage by regular street sweeping of all roads with curb and gutter.										X					X	X			Local Govts

Stream Remediation and Protection
Protection Measures

Status	Stream Remediation and Protection Tasks	ES Endangered Species	WQ Lack of Water Quality Trend Data	ID Illegal Dumping	E/A Lack of Education/Awareness	GR Growth Rate / Urban Development	AR Agricultural Runoff	SR Silviculture Runoff	UR Urban Runoff	S Sedimentation	N Nutrients	T Temperature / Thermal Stress	MR Mining Runoff	Ind Individuals	Org Organizations	Mun Municipalities	Cty Counties	State State	Fed Federal	Who
	Control thermal pollution in detention and settling basins by planting trees along the edge and on internal buffers.				X									X		X	X			Citizens Local Govts RPCs
	Coordinate resource agencies and property owners in distributing information regarding federal cost-share programs as an incentive for habitat protection.	X												X	X			X	X	USFWS ADCNR NRCS, SWCD ADEM LCRB SC Landowners
	Encourage forest landowners to designate a vegetated streamside management zones to filter runoff water before it enters the stream.							X						X	X					LCRB EC AFA APPCo NRCS

Status	Stream Remediation and Protection Tasks	Issue												Responsibility						Who
		ES	WQ	ID	E/A	GR	AR	SR	UR	S	N	T	MR	Ind	Org	Mun	Cty	State	Fed	
	Initiate clean-up programs to eliminate illegal dumps.(NOTE: these are two very different items – illegal dumps are regulated by ADEM and are usually located on private property and litter clean-ups are citizen driven and are usually conducted on public property or right of way)			X										X	X	X	X			ADEM, APCO LCRB EC Local Govts HOBOs
	Make requests to the Alabama Department of Environmental Management for regular monitoring of waterbodies near permitted mining actitivities												X	X	X	X	X	X		ADEM LCRB SC Local Govts Citizens
	Manage stormwater runoff to prevent flooding by enforcing the provisions of local flood prevention ordinances, especially provisions regarding encroachment and construction in the floodplain or flood fringe.						X										X			County Govts
	Manage stormwater runoff to prevent flooding, especially of areas that are not normally wet, by discouraging the deposition of logging debris in waterways.							X						X	X					LCRB EC AFA APPCo
	Manage the amount of runoff and pollution from commercial shopping centers and strip commercial development by providing cisterns to store runoff to be released at slower rates.					X			X					X		X				Local Govts Developers
	Manage thermal pollution and stabilize stream banks by planting or replanting trees in open areas along waterways.					X	X	X	X					X	X	X	X		X	LCRB SC USFWS Local Govts Citizens NRCS, SWCD
	Organize efforts to acquire known habitat areas through land trust organizations.	X												X	X					LCRB SC Interest Groups RPCs

Status	Stream Remediation and Protection Tasks	Issue												Responsibility						Who
		ES	WQ	ID	E/A	GR	AR	SR	UR	S	N	T	MR	Ind	Org	Mun	Cty	State	Fed	
	Preserve urban flood control capacity by not paving in curb and gutter section and by retaining stormwater on site.				X											X	X	X		Local Govts ALDOT RPCs
	Preserve urban flood control capacity by not paving in curb and gutter section.								X					X		X	X	X		ALDOT Local Govts Contractors
	Promote land development measures and other activities that do not impair wetland form and functions and to preserve designated habitats.	X												X	X	X	X			ALDOT ADCNR ADEM NEMO, RPCs NRCS, SWCD LCRB SC Local Govts Interest Groups
	Promote land use planning as a means to segregate mining operations from waterbodies, or, to include significant buffer zones in mining operation management.												X		X	X	X	X		ADEM LCRB SC Local Govts
	Support and participate in the Adopt-A-Mile program to maintain clean roadways and accompanying drainage channels and support on-going lake clean up efforts such as Alabama Power's Renew Our Rivers Campaign..			X										X	X					LCRB SC LCRB EC Citizens PALS
	Utilize existing federal programs to protect and restore habitats.	X												X	X			X	X	USFWS NRCS, ADEM ADCNR LCRB SC Landowners
	Work with interest groups to promote conservation easements and other land protection strategies.	X												X	X					LCRB SC NEMO, NRCS SWCDs Interest Groups RPCs

Part IV
Appendices

Appendix A: Endangered Species
Appendix B: USGS Administrative Report
Appendix C: Water Quality Monitoring Data
Appendix D: Watershed Rating Factor Worksheets
Appendix E: Watershed Management Resources

Appendix A
Endangered Species

The following pages are excerpts from the appendices of a document produced by the U.S. Fish and Wildlife Service, Division of Ecological Services in January 1997. The document is entitled *Protected Species Inventory and Identification in the Alabama-Coosa-Tallapoosa and Apalachicola-Chattahoochee-Flint River Basins*. The document was produced as report to the Technical Coordination Group of the ACT-ACF Comprehensive Study. This material was used to identify the protected species that may be found within the Lower Coosa River Basin. Therefore, the only pages that are included in this appendix are those descriptions of species that are relevant to the Lower Coosa River Basin Management Plan. Information on vertebrates and invertebrates was excerpted from Appendix B and Appendix C of the Protected Species Inventory and Identification in the Alabama-Coosa-Tallapoosa and Apalachicola-Chattahoochee-Flint River Basins document and information on plants was excerpted from Volume II.

Charts showing the protected species found in the Lower Coosa River Basin and their distribution are included on the following pages. The summary charts are then followed by the US. Fish and Wildlife abstract of each specie.

Protected Species in the Lower Coosa River Basin		
Vertebrates		
Common Name	**Scientific Name**	**Distribution in Lower Coosa River**
Crystal Darter	*Crystallaria asprella*	Elmore County, below Jordan Dam
Blue Sucker	*Cycleptus elongates*	Riverine habitat throughout basin
Blue Shiner	*Cyprimella caerulea*	Weogufka Creek
Coldwater Darter	*Etheostoma ditrema*	(1) Spring-dwelling race-Shelby to Coosa Counties (2) Stream race-Waxahatchee Creek tribs, Shelby County; Coosa River tribs, Coosa County
Coal Darter	*Percina brevicauda*	Coosa River and Hatchet Creek
Dusky Gopher Frog	*Rana capito sevosa*	Shelby County
Alligator Snapping Turtle	*Macroclemys temminckii*	Throughout basin
Northern Pine Snake	*Pituophis melanoleucus*	Throughout basin
Eastern Box Turtle	*Terrapene carolina*	Throughout basin, esp. forested floodplains
Cooper's Hawk	*Accipiter cooperii*	Throughout basin
Bachman's Sparrow	*Aimophila aestivalis*	Coastal Plain and Piedmont province
Common Ground Dove	*Columbina passerine*	Coastal Plain province, rare above Fall Line
Southeastern American Kestrel	*Falco sparverius paulus*	Throughout basin
Bald Eagle	*Haliaeetus leucocephalus*	Coastal Plain and Piedmont province
Black Rail	*Laterallus jamaicensis*	Throughout basin, county data not available
Red-cockaded Woodpecker	*Picoides borealis*	Coastal Plain province
Appalachian Bewick's wren	*Thryomanes bewickii altus*	North of the Fall Line, particularly in Ridge and Valley province
Southeastern Pocket Gopher	*Geomys pinetis*	Coastal Plain province
Southeastern Weasel	*Mustela frenata olivacea*	Throughout basin, county data not available
Southeastern Myotis	*Myotis austroriparius*	Throughout basin
Rafinesque's Big-eared Bat	*Plecotus rafinesquii*	Throughout basin
Brazilian Free-tailed Bat	*Tadarida brasiliensis*	Throughout basin, county data not available
Meadow Jumping Mouse	*Zapus hudsonius*	Chilton, Coosa and Elmore Counties
Source: Protected Species Inventory and Identification in the Alabama-Coosa-Tallapoosa and Apalachicola-Chattahoochee-Flint River Basins. Volume I Summary Report, Appendices A-C. Report to the Technical Coordination Group of the ACT-ACF Comprehensive Study. Prepared by U.S. Fish and Wildlife Service, Division of Ecological Services, Panama City, Florida. Gail A. Carmody, Project Leader; John W. Kasbohm, Biologist; Brian K. Luprek, Biologist; Jerry W. Ziewitz, Biologist. January 1997.		

Protected Species in the Lower Coosa River Basin		
Invertebrates		
Common Name	**Scientific Name**	**Distribution in Lower Coosa River**
Fine-lined Pocketbook	*Lampsilis altilis*	Yellowleaf Creek, Shelby County; Tallassehatchee Creek, Talladega and Clay Counties
Alabama Moccasinshell	*Medionidus acutissimus*	Coosa River drainage
Coosa Moccasinshell	*Medionidus parvulus*	Tributaries to Coosa River
Shoal Sprite	*Amphigyra alabamensis*	Throughout basin, no county data available
Mud Elimia	*Elimia alabamensis*	Shelby, Talladega, Chilton, Coosa Counties
Walnut Elimia	*Elimia bellula*	Yellowleaf Creek, Shelby County
Lacy Elimia	*Elimia crenatella*	Weewoka Creek, Talladega County
Banded Elimia	*Elimia fascians*	Yellowleaf Creek, Shelby County
Silt Elimia	*Elimia haysiana*	Below Jordan Dam, Elmore County
Round Rocksnail	*Leptoxis ampla*	Near Wetumpka, Elmore County
Spotted Rocksnail	*Leptoxis picta*	Near Wetumpka, Elmore County
Painted Rocksnail	*Leptoxis tainiata*	Shoals near Wetumpka, Elmore County; Buxahatchee Creek, Shelby County
Cylindrical lioplax	*Lioplax cyclostomaformis*	Throughout basin
Snail	*Neoplanoribis carinatus* *Neoplanorbis smithi* *Neoplanorbis tantillus* *Neoplanorbis umbilicatus*	Endemic to the Coosa River system. All known habitat has been inundated by Lay Dam, Jordan Dam and Mitchell Dam. Presumed extinct.
Rough Hornsnail	*Pleurocera foremani*	Throughout basin. May be extinct.
Upland Hornsnail	*Pleurocera showalteri*	Shelby and Talladega Counties
Wicker ancylid	*Rhodacme filosa*	Throughout basin, county data not available.
Golden Pebblesnail	*Somoatogyrus aureaus*	Yellowleaf Creek, Shelby County
Knotty Pebblesnail	*Smoatogyrus constrictus*	Wetumpka, Elmore County; Wilsonville, Shelby County. May be extinct.
Coosa Pebblesnail	*Somatogyrus coosaensis*	Throughout basin
Stocky Pebblesnail	*Somatogyrus crassus*	Main stem in Elmore, Chilton, Coosa Counties. May be extinct.
Hidden Pebblesnail	*Somatogyrus decipiens*	Chilton, Coosa Counties. May be extinct.
Fluted Pebblesnail	*Somatogyrus hendersoni*	Main stem, Coosa, Chilton Counties. May be extinct.
Granite Pebblesnail	*Somatogyrus hinkleyi*	Wetumpka, Elmore County; Wilsonville, Shelby County.
Dwarf Pebblesnail	*Somatogyrus nanus*	Main stem throughout basin. Weogufka Creek, Elmore County.
Moon Pebblesnail	*Somatogyrus obtusus*	Chilton-Coosa County shoals
Pygmy Pebblesnail	*Somatogyrus pygmaeus*	Chilton County. May be extinct.
Quadrate Pebblesnail	*Somoatogyrus quadratus*	Coosa River. County data not available.
Tulotoma Snail	*Tulotoma magnifica*	Near Wetumpka, Elmore County; Weogufka Creek, Hatchett Creek, Coosa County.
Cobblestone Tiger Beetle	*Cicindela marginipennis*	Near Wetumpka, Elmore County
Sixbanded Longhorn Beetle	*Dryobis sexnotatus*	Throughout basin, county data not available
Source: Protected Species Inventory and Identification in the Alabama-Coosa-Tallapoosa and Apalachicola-Chattahoochee-Flint River Basins. Volume I Summary Report, Appendices A-C. Report to the Technical Coordination Group of the ACT-ACF Comprehensive Study. Prepared by U.S. Fish and Wildlife Service, Division of Ecological Services, Panama City, Florida. Gail A. Carmody, Project Leader; John W. Kasbohm, Biologist; Brian K. Luprek, Biologist; Jerry W. Ziewitz, Biologist. January 1997.		

Protected Species in the Lower Coosa River Basin		
Plants		
Common Name	**Scientific Name**	**Distribution in Lower Coosa River**
Price's Potatoe-bean	*Apios priceana*	Autauga County
Georgia Rock-cress	*Arabis georgiana*	Elmore County
Shoals Spiderlily	*Hymenoccallis coronaria*	Shelby County
Running Post Oak	*Quercus boyntonii*	Ridge and Valley Province of Shelby County
Pinnate-lobed Coneflower	*Rudbeckia triloba*	Autauga County
Alabama Canebrake Pitcherplant	*Sarracenia rubra*	Autauga, Chilton, Elmore Counties
Nevius Stonecrop	*Sedum nevii*	Chilton, Coosa, Talladega Counties
Horse-nettle	*Solanum carolinense* var. *hirsutum*	Chilton, Coosa Counties
Pickering Morning-glory	*Stylisma pickeringii*	Autauga County
Roundleaf Meadowrue	*Thalictrum subrotundum*	Autauga, Clay Counties
Source: Protected Species Inventory and Identification in the Alabama-Coosa-Tallapoosa and Apalachicola-Chattahoochee-Flint River Basins. Volume II Summary Report, Appendix D. Report to the Technical Coordination Group of the ACT-ACF Comprehensive Study. Prepared by U.S. Fish and Wildlife Service, Division of Ecological Services, Panama City, Florida. Gail A. Carmody, Project Leader; John W. Kasbohm, Biologist; Brian K. Luprek, Biologist; Jerry W. Ziewitz, Biologist. January 1997.		

PROTECTED SPECIES INVENTORY AND IDENTIFICATION

in the Alabama-Coosa-Tallapoosa and Apalachicola-Chattahoochee-Flint River Basins

APPENDIX B

SPECIES ABSTRACTS FOR VERTEBRATES

Information compiled by:

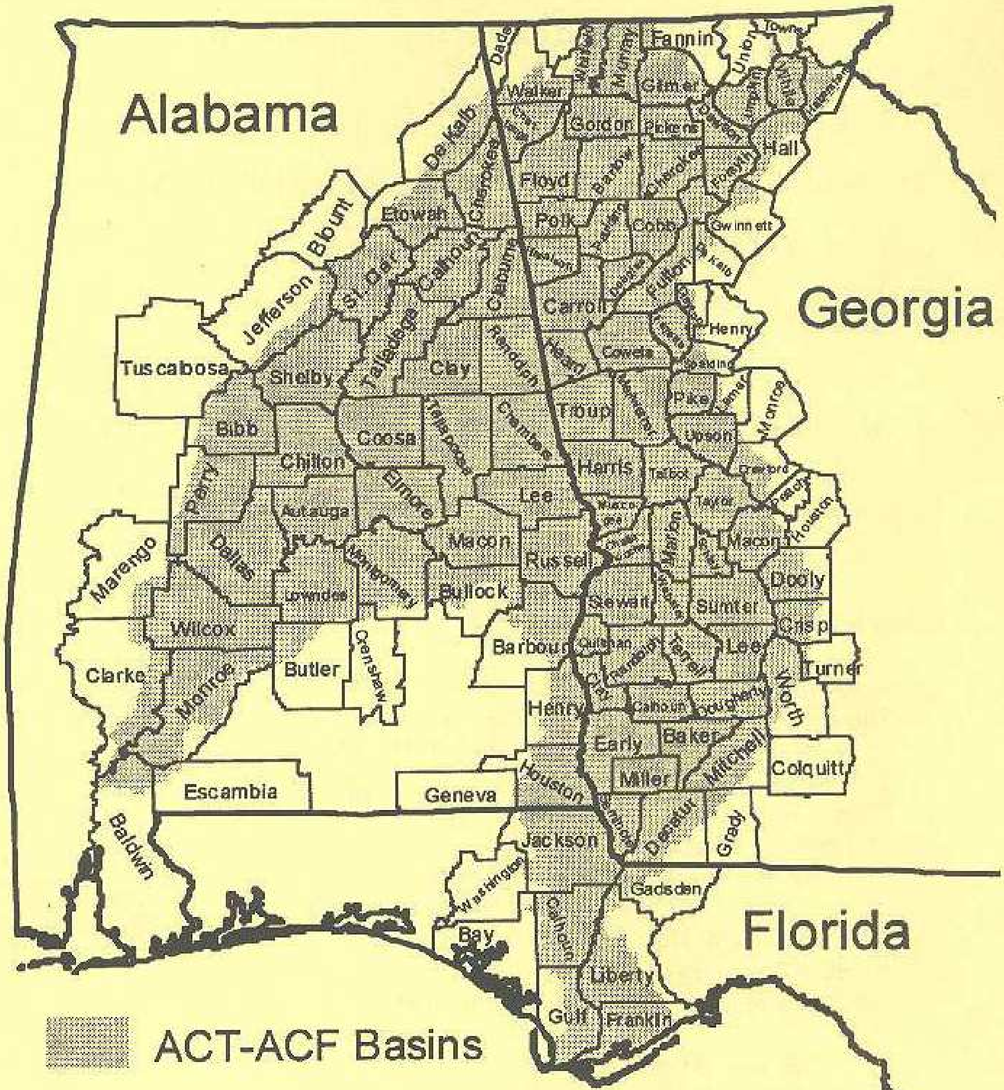
Alabama Natural Heritage Program
The Nature Conservancy and the
Alabama Department of Conservation and Natural Resources

Florida Natural Areas Inventory
The Nature Conservancy and the
Florida Department of Natural Resources

Georgia Natural Heritage Program
Wildlife Resources Division
Georgia Department of Natural Resources

U.S. Fish and Wildlife Service
Panama City, Florida, Field Office
Department of the Interior

January 1997



Counties that are wholly or partially within the ACT-ACF Basins.

Crystallaria asprella Jordan — Crystal darter

Family Percidae

Synonyms *Pleurolepis asprellus, Etheostoma asprellum, Ammocrypta asprella*

Legal Status Alabama state protected.

Reasons for Current Status Chemical and physical alterations of its habitat have resulted in extirpation in many portions of its range.

Description A darter with a very slender body and wide flat head. The crystal darter may reach a maximum total length of 16 cm. The coloration of the body is a brown mottling with 4 dark brown saddles. A black stripe runs around the snout from eye to eye.

Distribution This species has a range in the Mississippi River basin from Ohio to Minnesota, south to Mississippi, northern Louisiana, and southeastern Oklahoma and east to Alabama in the Gulf slope drainages. In Alabama the species is restricted to the main channels of the Tombigbee, lower Cahaba, lower Tallapoosa, Alabama, and Mobile rivers. Also in Alabama portion of main Conecuh River and the Escambia River in Florida. Previously it was thought to have been extirpated from the upper Coosa River, but several specimens were collected on the Coosa River below Jordan Dam, Elmore County, Alabama in 1993-94 (J.M. Pierson 1994, pers. comm.).

Habitat Riverine/mainstream/run. This darter is found in clean, current-swept beds of sand and gravel.

Other Biological Data This fish buries itself in the sand with only its eyes protruding and darts out at passing prey, including midge and blackfly larvae. These prey types indicate that it is an opportunistic browser and also feeds upon drift items. It probably spawns in the late winter or early spring. Most individuals probably live less than 4 years.

Concerns Degradation of its riverine habitat from siltation, chemical spills, and gravel mining and washing. Additional impoundments could further reduce and fragment remaining riverine habitat.

References

Becker, G.C. 1983. Fishes of Wisconsin. Univ. of Wisconsin Press, Madison. 1053 pp.

Boschung, H.T. 1992. Catalogue of freshwater and marine fishes of Alabama. Bull. Alabama Mus. Nat. Hist. No. 14. 266 pp.

Gilbert, C.R., ed. 1992. Rare and endangered biota of Florida, Vol. 2: Fishes. Univ. Press of Florida, Gainesville. 247 pp.

Kuehne, R.A., and R.W. Barbour. 1983. The American darters. Univ. Press of Kentucky, Lexington. 177 pp.

Lee, D.S., C.R. Gilbert, C.H. Hocutt, R.E. Jenkins, D.E. McAllister, and J.R. Stauffer, Jr. 1980. Atlas of North American freshwater fishes. North Carolina Biological Survey Publ. No. 1980-12. 867 pp.

Mettee, M.F., P.E. O'Neil, J.M. Pierson, and R.D. Suttkus. 1989. Fishes of the Western Mobile River Basin in Alabama and Mississippi. Geological Survey of Alabama, Atlas 24. 170 pp.

Mount, R.H. ed. 1986. Vertebrate animals of Alabama in need of special attention. Ala. Agr. Expt. Sta., Auburn Univ. 124 pp.

Page, L.M., and B.M. Burr. 1991. A field guide to freshwater fishes. Houghton Mifflin Co., Boston. 432 pp.

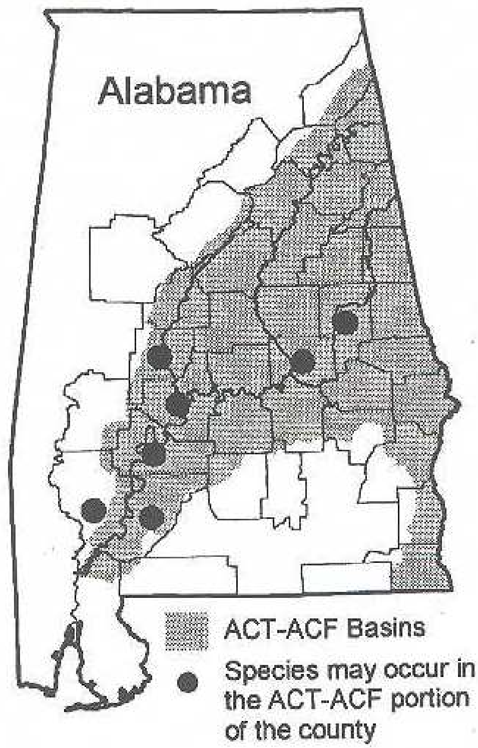
Pierson, J.M., W.M. Howell, R.A. Stiles, M.F. Mettee, P.E. O'Neal, R.D. Suttkus, and J.S. Ramsey. 1989. Fishes of the Cahaba River system in Alabama. Geological Survey of Alabama. 183 pp.

Ramsey, J.S. 1976. Freshwater fishes. *In* H.T. Boschung, ed. Endangered and threatened plants and animals of Alabama. Bull. Alabama Mus. of Nat. Hist. No. 2.

Robinson, H.W., and T.H. Buchanan. 1988. Fishes of Arkansas. Univ. of Arkansas Press, Fayetteville. 536 pp.

Crystallaria asprella Jordan

Crystal darter



Cycleptus elongatus Lesueur

Blue sucker

Family Catostomidae

Synonyms *Catostomus elongatus*

Legal Status Federal species of concern

Reasons for Current Status The species has been declining throughout its range.

Description The blue sucker has a long compressed body (length over 2 feet) with a small head. It is olive-blue or gray dorsally and blue-white ventrally, with dark blue-gray fins. The dorsal fin is long and falcate. The small horizontal mouth is overhung by the tapered snout. The caudal peduncle is long.

Distribution The blue sucker is in the Mississippi River basin from Pennsylvania west to central Montana and south to Louisiana, and in Gulf drainages from New Mexico east to Alabama. In Alabama, the blue sucker has been reported from the Alabama, Cahaba, Coosa, Tallapoosa, and upper and lower Tombigbee rivers.

Habitat Riverine/mainstream. The blue sucker is present in larger rivers and tributaries in channels and pools with a moderate current. The species occurs over substrates of exposed bedrock, hard clay, sand, or gravel.

Other Biological Data This species feeds on aquatic insects and other small invertebrates, but may consume some plant material. The largest numbers of blue sucker collected in Alabama were collected in the Alabama River below Claiborne and Millers Ferry locks and dams from 1991-93 (Scott Mettee pers. comm. 1994). Individuals may live 10 years, and have been taken in breeding condition in April.

Concerns The blue sucker is susceptible to the effects of impoundment, channelization, eutrophication, and siltation. Habitat loss from impoundments may block spawning migrations and inundate spawning sites. The species may be intolerant of chronic turbidity.

References

Boschung, H.T. 1992. Catalogue of freshwater and marine fishes of Alabama. Bull. Alabama Mus. Nat. Hist. No. 14. 266 pp.

Lee, D.S., C.R. Gilbert, C.H. Hocutt, R.E. Jenkins, D.E. McAllister, and J.R. Stauffer, Jr. 1980. Atlas of North American freshwater fishes. North Carolina Biological Survey Publ. No. 1980-12. 867 pp.

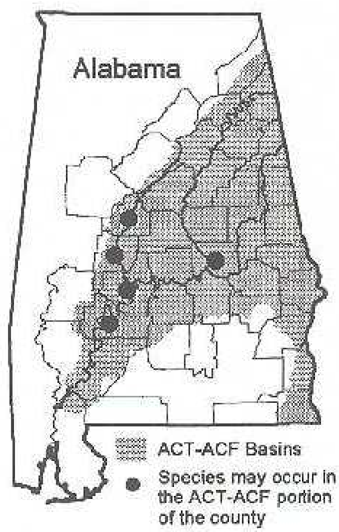
Mettee, M.F., P.E. O'Neil, J.M. Pierson, and R.D. Suttkus. 1989. Fishes of the Western Mobile River Basin in Alabama and Mississippi. Geological Survey of Alabama. Atlas 24. 170 pp.

Page, L.M., and B.M. Burr. 1991. A field guide to freshwater fishes. Houghton Mifflin Co., Boston. 432 pp.

Pierson, J.M., W.M. Howell, R.A. Stiles, M.F. Mettee, P.E. O'Neal, R.D. Suttkus, and J.S. Ramsey. 1989. Fishes of the Cahaba River system in Alabama. Geological Survey of Alabama. 183 pp.

Ramsey, J.S. 1976. Freshwater fishes. *In* H.T. Boschung, ed. Endangered and threatened plants and animals of Alabama. Bull. Alabama Mus. of Nat. Hist. No. 2.

Robinson, H.W., and T.M. Buchanan. 1988. Fishes of Arkansas. Univ. of Arkansas Press. Fayetteville. 536 pp.



Cyprinella caerulea Jordan — Blue Shiner

Family Cyprinidae

Synonyms *Photogenis caeruleus, Erogala caerulea; Notropis caeruleus*

Legal Status Federal threatened (57 FR 14790, April 22, 1992); Alabama state protected; Georgia endangered.

Critical Habitat Not designated

Reasons for Current Status Restricted distribution (Cahaba and Coosa river systems); extirpated over most of former range (Lee et al. 1980). Only extant population in Georgia restricted to the upper Conasauga River. No blue shiners have been captured in the Cahaba River since 1971. No collections of this species have been made in Big Wills Creek, a tributary of the Coosa River, since 1958. Remaining populations are fragmented and isolated.

Description Total length to 9 cm; body compressed. Pointed snout slightly projects over the subterminal mouth. Pale brown dorsum, silver along sides. A distinctive metallic blue-black lateral stripe runs from the opercle to the caudal peduncle where it widens to form a caudal spot. Dorsal fin of large individuals may be marked by a black blotch. Lateral scales are edged with melanophores and have a diamond-shaped appearance. Pharyngeal tooth formula 1,4-4,1; complete lateral line with 37-39 scales; 8 anal rays. Breeding males develop light yellow fins.

Distribution Endemic to the Mobile River drainage. Historically known from the Coosa and Cahaba river systems of southeast Tennessee, northwest Georgia and Alabama. Presumed extirpated from the Cahaba and Big Wills Creek (Coosa system) (Pierson and Krotzer 1987, Pierson et al. 1989). In Georgia, this species has been collected from the Coosawattee River system in Gilmer County and from the Etowah and Conasauga river systems. Probably extirpated from the Etowah, Oostanaula and Coosawattee river systems. Currently, the only upper Coosa River occurrences in Georgia are from the upper Conasauga River system above the junction with Holly Creek. In Alabama, it is restricted to Weogufka and Choccolocco creeks and Little River (J.M. Pierson pers. comm. 1994).

Habitat Riverine/mainstream/(large) tributary. Small to medium streams over rocky substrate. Riffles and runs, and pools with moderate to slow current, over sand to gravel or cobble substrate. Eggs deposited in rock crevices, or possibly crevices in woody debris, in habitats with moderate current.

Other Biological Data This shiner appears intolerant of high turbitiy. It is probably a mid-depth feeder. Krotzer (1984) observed blue shiners spawning in the upper Conasauga River from early June through late July.

Concerns Excessive sediment deposition, resulting from erosional runoff from agricultural activites, road and bridge construction, and other land-disturbing activities. Silt deposition in runs and riffles reduces availability of suitable spawning habitat. Additional impoundments in the upper Coosa system could further reduce and fragment remaining riverine habitat. Improper chlorination in sewage treatment may be a problem (J.M. Pierson 1994, pers. comm).

References

Boschung, H.T. 1992. Catalogue of freshwater and marine fishes of Alabama. Bull. Alabama Mus. Nat. Hist. No. 14. 266 pp.

Krotzer, R.S. 1984. The ecological life history of the blue shiner, *Notropis caeruleus* (Jordan), from the upper Conasauga River, Georgia. M.S. Thesis, Samford University, Birmingham, Alabama.

Krotzer, R.S. 1990. Aspects of the life history of the blue shiner, *Notropis caeruleus*, in the Conasauga River, Georgia. Southeast Fishes Council Proc. 21:1-2.

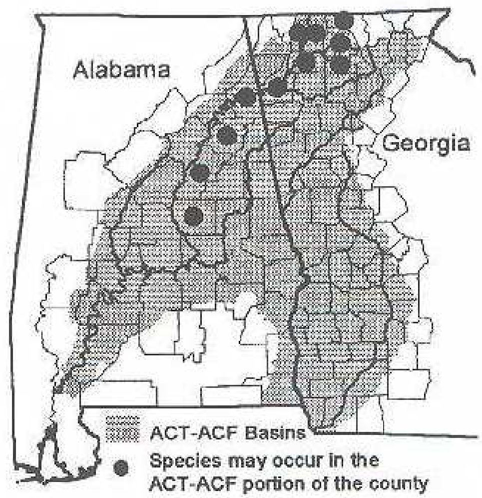
Lee, D.S., C.R. Gilbert, C.H. Hocutt, R.E. Jenkins, D.E. McAllister, and J.R. Stauffer, Jr. 1980. Atlas of North American freshwater fishes. North Carolina Biological Survey Publ. No. 1980-12. 867 pp.

Mount, R.H. ed. 1986. Vertebrate animals of Alabama in need of special attention. Ala. Agr. Expt. Sta., Auburn Univ. 124 pp.

Page, L.M., and B.M. Burr. 1991. A field guide to freshwater fishes. Houghton Mifflin Co., Boston. 432 pp.

Cyprinella caerulea Jordan

Blue Shiner



Pierson, J.M., and R.S. Krotzer. 1987. The distribution, relative abundance, and life history of the blue shiner, *Notropis caeruleus* (Jordan). Prepared for the Alabama Nongame Wildlife Coordinator. 105 pp.

Pierson, J.M., W.M. Howell, R.A. Stiles, M.F. Mettee, P.E. O'Neal, R.D. Suttkus, and J.S. Ramsey. 1989. Fishes of the Cahaba River system in Alabama. Geological Survey of Alabama. 183 pp.

Ramsey, J.S. 1976. Freshwater fishes. *In* H.T. Boschung, ed. Endangered and threatened plants and animals of Alabama. Bull. Alabama Mus. of Nat. Hist. No. 2.

U. S. Fish and Wildlife Service. 1991. Endangered and threatened wildlife and plants; proposed threatened status for the fish the goldline darter (*Percina aurolineata*) and blue shiner (*Cyprinella caerulea*). Fed. Reg. 56(76):16054-16059.

Etheostoma ditrema Ramsey and Suttkus — Coldwater darter

Family Percidae

Synonyms *Boleichthys elegans*

Legal Status Federal species of concern; Alabama state protected; Georgia threatened.

Reasons for Current Status Restricted distribution and requirement for spring and spring run habitats; vulnerable to local extirpation as a result of spring-habitat alteration.

Description A small (50 mm maximum standard length) member of the subgenus *Oligocephalus* (Ramsey and Suttkus 1965). Typically mottled brown, with brown banding on the medial fins, a distinct suborbital bar, and three dark spots vertically aligned at the base of the caudal fin. Breeding males have a blue marginal and a red submarginal band on the spinous dorsal, and profuse orange ventrally, often from the belly to the caudal peduncle. The lateral line is incomplete, slightly arched anteriorly, and forms a pale stripe laterally.

Distribution The Coosa River basin of north Georgia, north Alabama, and southeastern Tennessee. All populations occur north of the Fall Line.

In Georgia, known historically from Millpond in the Etowah River basin (Floyd County), Moses Spring in Chattooga River basin (Chattooga County), an unnamed tributary to the Oostanaula River at Rome, Georgia, and five springs in the Conasauga River basin (Utter 1984). The coldwater darter is presumed extirpated from the Etowah River basin and probably at least one of the Conasauga River localities.

In Alabama, a spring-dwelling race is present in few springs and pools in the Coosa River drainage, from Shelby to Coosa counties. A stream race also is found in tributaries of Waxahatchee Creek in Shelby County and 2 tributaries of the Coosa River in Coosa County.

Habitat Riverine/tributary/run/pool. Vegetated limestone spring pools and runs are the typical habitat. The darter prefers areas of sluggish current with beds of *Fontinalis* and *Fissidens*.

Seesock (1979) described habitat conditions in Glencoe Spring (Etowah County, AL), site of a coldwater darter population: nearly constant water temperature, ranging from 16.1 to 17.8 degrees C; low current velocity; water depth averaging 1 m; and patches of *Myriophyllum* sp. and *Fontinalis* sp. in the spring run. Seesock (1979) primarily captured coldwater darters in beds of *Fontinalis*, and secondarily in *Myriophyllum*, rarely finding individuals over open substrate. Vegetation also is necessary as a spawning substrate. Seesock (1979) found evidence of spawning by coldwater darters in Glencoe Spring over a prolonged period from March through September.

Occasional coldwater darter specimens have been collected in the Conasauga River near the Georgia-Tennessee boundary. It is unknown whether these individuals represent river-dwelling populations or strays from springs connected to the river.

Other Biological Data Coldwater darters live less than two years; thus, successful spawning every year is essential to population persistence. Prey primarily consists of small crustaceans (especially amphipods) and insect larvae (Seesock 1979).

Concerns Degradation of springs through removal of vegetation, pollution, and inundation are potential threats. It is possible that the introduction of grass carp and common carp will reduce cover and expose the coldwater darter to predators which have entered the springs (M. Mettee 1994, pers. comm.).

Conversion to a concrete-bottom swimming pool has probably eliminated the coldwater darter from Sand Spring in Whitfield County, Georgia (Conasauga River basin). One other known locality, a spring at the junction of Georgia Highways 2 and 225, has recently been cleared of surrounding vegetation, threatening habitat integrity for the spring fauna. Without specific protection, the coldwater darter clearly is vulnerable to extirpation.

References

Boschung, H.T. 1992. Catalogue of freshwater and marine fishes of Alabama. Bull. Alabama Mus. Nat. Hist. No. 14. 266 pp.

Kuehne, R.A., and R.W. Barbour. 1983. The American darters. Univ. Press of Kentucky, Lexington. 177 pp.

Percina brevicauda Suttkus & Bart

Coal darter

Family Percidae

Synonyms *Percina copelandi*

Legal Status Federal species of concern.

Reasons for Current Status Reduction in the range and numbers of this fish have prompted its Federal species of concern status.

Description The coal darter, formerly named the Alabama channel darter, is 30 to 45 mm in length with a blunt snout, a black medial caudal spot, olive coloration on the dorsum, and 8 to 12 horizontally oblong black blotches along the side. There is no premaxillary frenum.

Distribution The coal darter has been reported from the Cahaba River, Coosa River, Black Warrior River, Locust Fork, Little Cahaba River (Bibb County), Hatchet Creek, and Six Mile Creek.

Habitat Riverine/mainstream/tributary/riffle/run. Shoals of rivers and larger streams with gravel, cobble, and sand substrates, and a swift current (Mettee et al. 1996).

Other Biological Data Males and females, in a state of reproductive readiness, were collected in late May in the upper Cahaba River.

Concerns Water quality problems resulting from mining, sedimentation, and eutrophication. Additional impoundments within its range could reduce and fragment remaining riverine habitat.

References

Boschung, H.T. 1992. Catalogue of freshwater and marine fishes of Alabama. Bull. Alabama Mus. Nat. Hist. No. 14. 266 pp.

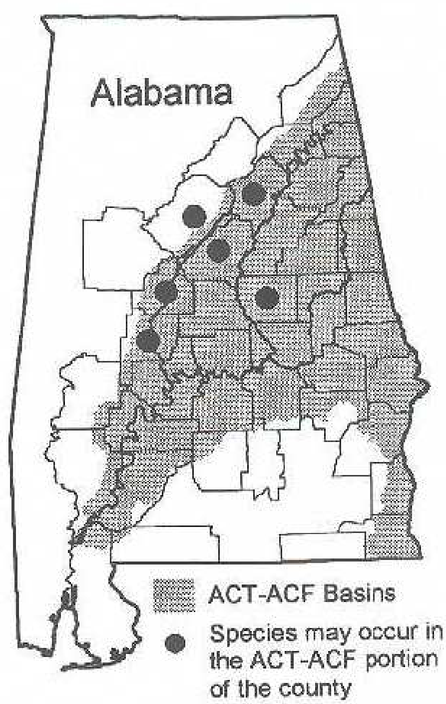
Kuehne, R.A., and R.W. Barbour. 1983. The American darters. Univ. Press of Kentucky, Lexington. 177 pp.

Mettee, M.F., P.E. O'Neil, and J.M. Pierson. Fishes of Alabama and the Mobile Basin. 1996. Oxmoor House, Inc. Birmingham, AL. 820 pp.

Page, L.M., and B.M. Burr. 1991. A field guide to freshwater fishes. Houghton Mifflin Co., Boston. 432 pp.

Pierson, M.J., WM. Howell, R.A. Stiles, M.F. Mettee, P.E. O'Neil, R.D. Suttkus, and J.S. Ramsey. 1989. Fishes of the Cahaba River System in Alabama. Geological Survey of Alabama. Bull. No. 134. 183 pp.

Suttkus, R.D., B.A. Thompson, and H.L. Bart. 1994. Two new darters, *Percina* (*Cottogaster*) from the southeastern United States, with a review of the subgenus. Occasional Papers Tulane University Museum of Natural History. 46 pp.



Rana capito sevosa Dusky gopher frog

Family Ranidae

Synonyms *Rana areolata sevosa*, *R. sevosa*

Legal Status Federal species of concern; Alabama state protected, (as *Rana areolata sevosa*).

Reasons for Current Status Few populations are known, habitat requirements are extremely specific, declines have been documented, and this species is highly dependent on gopher tortoise (*Gopherus polyphemus*) burrows.

Description A stout, spotted frog, about 10 cm long, with a large head and a thick ridge of skin extending down the back behind each eye. Snout is pointed somewhat. Back is rough and gray or light brown with dark blotches. Belly and throat white with many small spots, inner surfaces of hind legs washed with yellow.

Distribution Gopher frogs (*R. capito*) are known throughout the study area. The range of the dusky subspecies (*R. capito sevosa*) extends from the Apalachicola River westward to Louisiana. In Alabama gopher frogs are known from Barbour and Shelby counties, although some researchers believe they may be extirpated from Barbour County (R. Mount 1994, pers. comm.).

Habitat Terrestrial/forest-woodlands/scrub-shrub; Palustrine. Non-breeding habitat is typically open longleaf pine/scrub oak forests on sandy soils, especially in areas where gopher tortoises are found. Upland habitat must be within a mile or two of a suitable breeding site, which is usually an ephemeral sinkhole pond.

Other Biological Data The gopher frog is dependent on the commensal relationship with the gopher tortoise, more so than any other vertebrate species (Godley 1992:18). Breeding typically occurs in February and March. Taxonomy of the subspecies of gopher frogs in Georgia is very difficult; W. Seyle (Pers. comm. 1994) recommended referring to the Georgia population as *R. capito sevosa* x *aesopus*.

Concerns Impoundments could destroy sandhill habitat. Certain forestry practices continue to alter sandhill habitat, and development is a constant threat. Introduction of fish to breeding ponds has adversely affected some populations. The gopher frog depends on gopher tortoise burrows for habitat. Any decline in the tortoise is likely to adversely affect gopher frogs. Direct loss of ephemeral ponds through dredging and/or storm-water diversion also is a concern (Moler 1994, pers comm.).

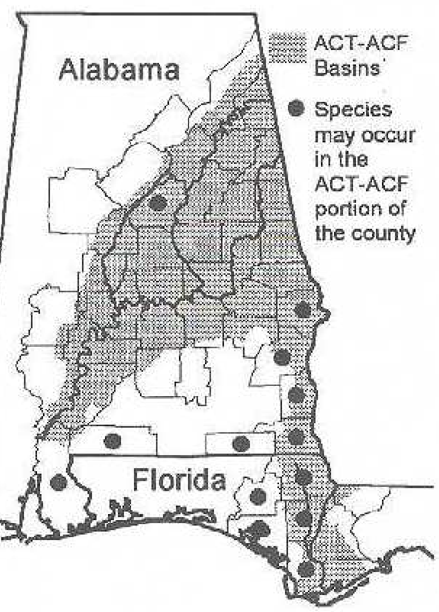
References

Bailey, M.A. Migration of the dusky gopher frog, *Rana areolata sevosa* and other winter breeding amphibians at a sinkhole pond in the Lower Coastal Plain of Alabama. Unpubl. MS thesis, Auburn Univ.

Godley, J.S. 1992. Gopher frog. Pages 15-19 *in* P.E. Moler, ed. Rare and endangered biota of Florida, Vol. 3: Amphibians and reptiles. Univ. Press of Florida, Gainesville. 292 pp.

Means, D.B. 1986. Dusky gopher frog, *Rana areolata sevosa* Goin and Netting. Pages 30-31 *in* R.H. Mount, ed. Vertebrate animals of Alabama in need of special attention. Ala. Agr. Expt. Sta., Auburn Univ.

Moler, P.E. 1994. Personal Communication.



Macroclemys temminckii — Alligator snapping turtle

Family Chelydridae

Synonyms None

Legal Status Federal species of concern; Alabama state protected; Georgia threatened.

Reasons for Current Status The alligator snapping turtle has declined (up to 95%) over much of its historic range, suffering considerable losses due to commercial taking (for consumption). Incidental deaths from fish trotlines have reportedly added to their decline. The alligator snapping turtle is a slow-breeding species and recovery will take a long time (Pritchard 1992:175).

Description The carapace of the alligator snapping turtle is large, rough, dark brown or dark gray, strongly serrated posteriorly, and has 3 high, persistent keels with elevated, posteriorly-curved knobs. The plastron is gray to mottled, and greatly reduced. The head is extremely large with a pointed snout and a strongly hooked upper jaw. There is a worm-like process on the tongue which serves as a lure to attract fish. Carapacial lengths range from 38-66 cm. Males attain a much larger size (at least to 107 kg) and have longer tails than females.

Distribution Extends from southern Georgia to eastern Texas, north to southeastern Kansas, Iowa, and southeastern Indiana (at least formerly). In Alabama, it is found throughout the study area. In Georgia, found throughout the Coastal Plain portions of the Chattahoochee and Flint river drainages. Occurs in the Okefenokee Swamp; may enter the St. Marys River drainage. Also occurs in the Withlacoochee River. In Florida, it is found in upper most Gulf coast rivers. "The Apalachicola/Chipola system, including Lake Seminole, is one of the most important in the nation for the genus Macroclemys" (Pritchard 1992:172).

Habitat Riverine; Lacustrine; Estuarine. Deep water of rivers, canals, lakes, and oxbows; also swamps, bayous, and ponds near deep running water. Sometimes enters brackish coastal waters. Usually in water with mud bottom and abundant aquatic vegetation.

Other Biological Data Population dynamics are driven by long-term survival of adults. It appears that an area can be "trapped out" after two or three seasons, and it may take up to ten years to recover (Pritchard 1992:175).

Concerns Commercial exploitation has been the greatest threat. Water quality degradation would affect prey abundance. Because this species is mainly a bottom feeder, increasing turbidity could impair its ability to visually locate prey.

References

Conant, R., and J.T. Collins. 1991. A field guide to reptiles and amphibians: Eastern and central North America. Houghton Mifflin Co., Boston. 450 pp.

Dobie, J.L. 1986. Alligator snapping turtle, *Macroclemys temminckii* (Troost). Pages 49-50 *in* Mount, R.H., ed. Vertebrate animals of Alabama in need of special attention. Ala. Agr. Expt. Sta., Auburn Univ. 124 pp.

Dobie, J.L. 1971. Reproduction and growth in the alligator snapping turtle, *Macroclemys temminckii* (Troost). Copeia 1971(4):645-658.

Ernst, C.H., and R.W. Barbour. 1989. Turtles of the world. Smithsonian Inst. Press, Washington, D.C. xii + 313 pp.

Figg, D.E. 1991. Missouri Dept. of Conservation Annual Nongame and Endangered Species Report July 1990 - June 1991. ii + 35 pp.

George, G. 1988. The current status of the alligator snapping turtle, *Macroclemys temminckii*, with a review of its natural history. Internat. Herpetol. Symp. Captive Propagation and Husbandry 11:75-81.

Mount, R.H. 1975. The reptiles and amphibians of Alabama. Auburn Univ. Agr. Exp. Sta. vii + 347 pp.

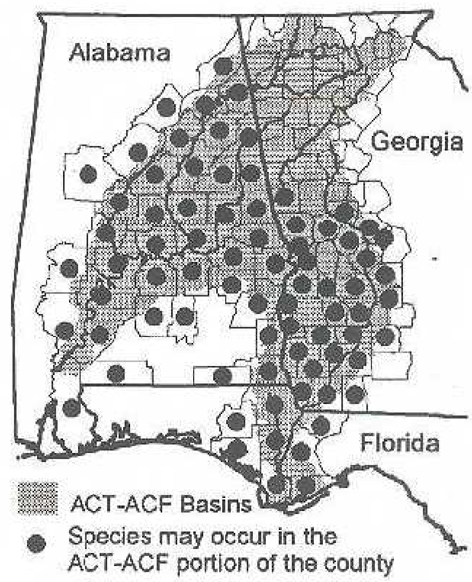
Pritchard, P.C.H. 1982. The biology and status of the alligator snapping turtle (*Macroclemys temminckii*) with research and management recommendations. Report to the U. S. Fish and Wildlife Service. 126 pp.

Pritchard, P.C.H. 1990. The alligator snapping turtle: biology and conservation. Milwaukee Public Museum. xii + 104 pp.

Macroclemys temminckii

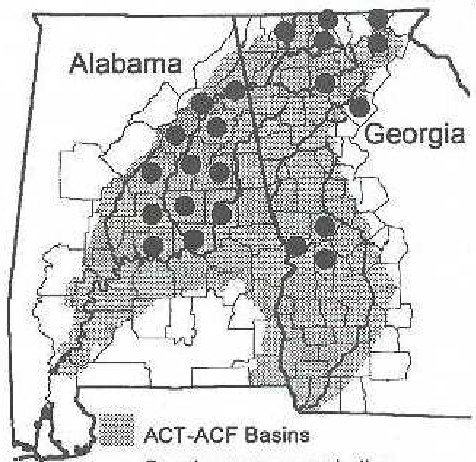
Alligator snapping turtle

Pritchard, P.C.H. 1992. *Macroclemys temmminckii*, alligator snapping turtle. Pages 171-177 *in* P.E. Moler, ed. Rare and endangered biota of Florida, Vol. 3: Amphibians and reptiles. Univ. Press of Florida, Gainesville. 292 pp.



Pituophis melanoleucus melanoleucus

Northern pine snake



Family Colubridae

Synonyms None

Legal Status Federal species of concern.

Reasons for Current Status Few specimens are known from Alabama, and numbers appear to be dwindling.

Description A large snake, to 2.1 m total length. Scales keeled, rostral scute enlarged, dorsal ground color white, cream, yellowish, or gray, with 25-31 dark blotches. Belly white.

Distribution Very local in distribution within the ACT/ACF study area. Occurs throughout the Coosa River basin. Possibly absent from the upper Tallapoosa system in Alabama, but does occur in Elmore County. The northern pine snake occurs from New Jersey to South Carolina and Georgia westward to Kentucky, Tennessee, and Alabama.

Habitat Terrestrial/forest-woodlands. In Alabama, the species typically occurs in pine or mixed pine/hardwood forest on relatively dry sites.

Other Biological Data Three subspecies of *Pituophis melanoleucus* occur in Alabama: *melanoleucus*, *mugitus*, and *lodingi*.

Concerns Development and conversion of natural pine and mixed pine sites to plantations. New reservoirs in its range could inundate habitat.

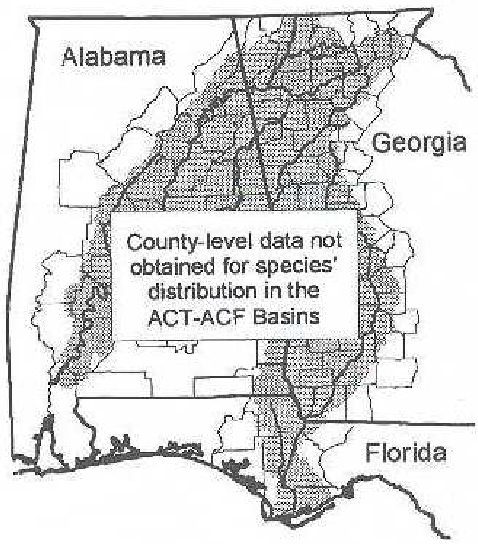
References

Mount, R.H. 1975. The reptiles and amphibians of Alabama. Ala. Agr. Expt. Sta., Auburn. 347 pp.

Mount, R.H. 1986. Northern pine snake, *Pituophis melanoleucus melanoleucus* (Daudin). Pages 70-71 *in* Mount, R.H., ed. Vertebrate animals of Alabama in need of special attention. Ala. Agr. Expt. Sta., Auburn Univ. 124 pp.

Terrapene carolina

Eastern box turtle



Family Emydidae

Synonyms None

Legal Status Alabama state protected.

Reasons for Current Status Although not uncommon in Alabama, herpetologists have noticed a substantial decline in numbers.

Description A medium-sized (to 19 cm) land turtle with a hinged plastron and high-domed, rounded carapace. Body color brownish to black, with variable yellow or orange markings.

Distribution Throughout the ACT/ACF study area, in virtually all natural terrestrial habitats. Forested floodplains may support the highest densities.

Habitat Terrestrial/forest-woodlands.

Other Biological Data Although primarily terrestrial, box turtles will move into stream margins during periods of hot weather.

Concerns A respiratory disease has been found in many populations, and has been thought to be responsible for some of the observed decline in this species. Road mortality impacts many populations, and fire ants may kill eggs and juveniles, but this has not been documented. Changes in water management would not likely affect this species.

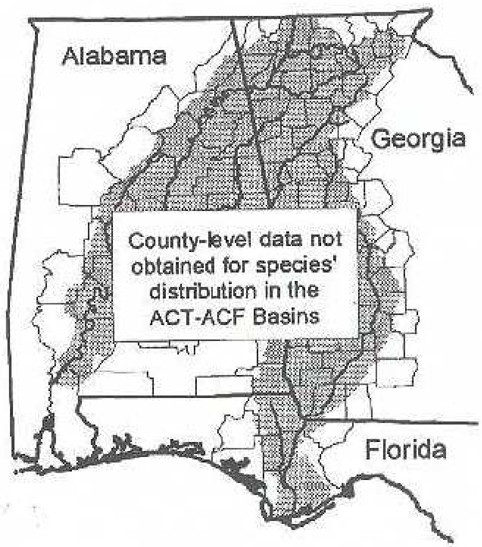
References

Mount, R.H. 1975. The reptiles and amphibians of Alabama. Ala. Agr. Expt. Sta., Auburn. 347 pp.

Mount, R.H. 1986. Box turtle, *Terrapene carolina* ssp. Pages 53-54 *in* Mount, R.H., ed. Vertebrate animals of Alabama in need of special attention. Ala. Agr. Expt. Sta., Auburn Univ. 124 pp.

Accipiter cooperii

Cooper's hawk



Family Accipitridac

Synonyms None

Legal Status Alabama state protected.

Reasons for Current Status Considered a "Species of Special Concern" in Alabama. The secretive habits of the Cooper's hawk limits the availability of accurate data. Current data is insufficient to accurately determine its status.

Description A crow-sized hawk, 380-510 mm in length with a wingspan of 710 mm. Adult plumage is slate-blue above with underparts barred with reddish-brown on a creamy-white background. Tail feathers are white-tipped and rounded, with three black bars.

Distribution Occurs throughout the study area. Confined to North America. The entire range extends from the southward limits of deciduous forests to the northern limit of tropical forests.

Habitat Terrestrial/forest-woodlands. Deciduous forests where openings occur.

Other Biological Data The primary prey are other birds. The secretive nature of its sit-and-wait hunting technique can lead to an underestimation of its numbers. Nesting is generally in the tops of tall trees. Clutch size ranges from 3 to 6.

Concerns No significant threats have been identified. Clearing hardwood forests destroys habitat.

References

Imhof, T.A. 1976. Alabama birds, 2nd ed. Univ. of Alabama Press, Tuscaloosa, AL.

Rogers, D.T. 1986. Cooper's Hawk, *Accipiter cooperii* Bonaparte. Pages 87-88 *in* R.H. Mount, ed. Vertebrate animals of Alabama in need of special attention. Ala. Agr. Expt. Sta., Auburn Univ.

Teres, J.K. 1987. The Audubon Society encyclopedia of North American birds. Alfred A. Knopf, New York. 1109 pp.

Aimophila aestivalis — Bachman's sparrow

Family Emberizidae

Synonyms None

Legal Status Federal species of concern; Georgia rare.

Reasons for Current Status Has declined over much of its range in the last 50 years; habitat loss apparently is an important factor (Dunning 1993). Data from the Breeding Bird Survey indicates that 90% of the recorded birds occurred in only 3 states (Florida, Georgia, Louisiana). In most areas, local populations have low densities. Has apparently been extirpated as a breeder in much of the northeastern and midwestern U.S.; populations are migratory and occur sporadically in the north central states (Hands et al. 1989).

Description A plain sparrow, with brownish-gray upper-parts tinged with reddish streaks. Has buffy underparts and a whitish belly. Typical of genus *Aimophila* in having a large bill and a long, rounded dark tail (Dunning 1993). Upper mandible dark, lower mandible pale. Easier to identify by its song than by its appearance. Sexes are similar. Total length 12.4-15.2 cm; weight 21 g. Overlaps in its range with the field sparrow (*Spizella pusilla*), which has a smaller bill and tail, white eye ring, plainer face, and 2 wingbars (Dunning 1993).

Distribution Historically, the breeding range has fluctuated greatly. From the 1890's through the 1920's, the breeding range extended from southern Missouri, Illinois, central Indiana, central Ohio, southwestern Pennsylvania, and Maryland south to eastern Texas, the Gulf Coast, and south central Florida. Currently, the breeding range is primarily the Coastal Plain and Piedmont of the southeastern U.S., from extreme southern Virginia south to central Florida, and west to eastern Texas. Winters chiefly in the south Atlantic and Gulf states (Bull and Farrand 1977). Winter status is uncertain in most of range because of extreme secretive behavior in winter (Dunning 1993).

Bachman's sparrow is considered an uncommon summer resident in Georgia, occurring in scattered populations throughout the state, except in the mountains. This species winters primarily in the Coastal Plain in Georgia, rarely in the Piedmont.

Habitat Terrestrial. Found primarily in pine woodlands or forest openings with a dense ground layer of grasses and forbs and an understory of scattered shrubs (Bull and Farrand 1977). In the South, traditionally associated with mature stands of longleaf pine-wiregrass. Now found most often in clearcuts, young pine plantations, and utility rights-of-way; also found in old fields and grassy orchards. Utilizes grassy edges of seasonal ponds, rock outcrops, agricultural fields, and road-cuts (Hardin and Progasco 1983).

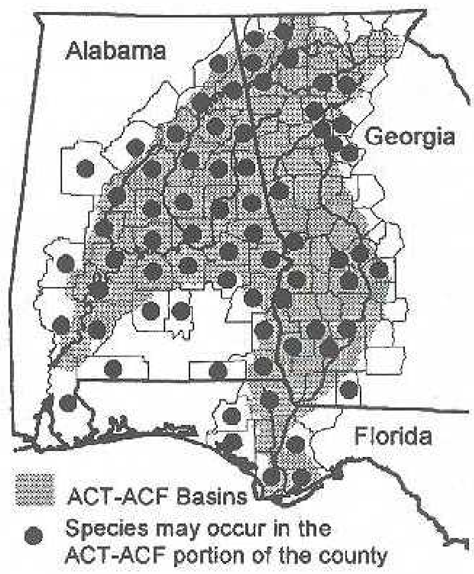
In South Carolina, higher densities were recorded in mature (> 80 years old) pine stands than in young stands; used areas with open understory and dense ground cover of grasses and forbs (Dunning and Watts 1990). Value of clearcuts as habitats is short-lived. Thought to have evolved as a fugitive species that bred wherever fires created the necessary conditions in the understory or removed the forest canopy (Ehrlich et al. 1992).

Other Biological Data Main food items include seeds of grasses, primarily those of the genus *Panicum*; insects and other invertebrates; and seeds of other herbaceous plants and pines. Forages on the ground (Terres 1980).

Nests on ground against or under tufts of grass, under low shrubs, in grassy openings, fields, or areas with scattered trees. Eggs are laid in April-July (mostly May-June), with the earliest nests in the southern part of the range. Clutch size is 3-5, with two broods per year. Incubation, by the female, lasts 12-14 days. Young are tended by both parents and leave nest at about 10 days while unable to fly.

Concerns Affected by forest management practices such as prescribed burning, thinning, and use of herbicides. In general, management practices that produce suitable habitat for red-cockaded woodpecker also provide habitat for this species (Dunning and Watts 1990). Not likely to be affected by changing water levels in the ACT-ACF study area, except in cases where isolated grassy habitats in lowlands would be inundated.

Aimophila aestivalis **Bachman's sparrow**



References

Bull, J., and J. Farrand, Jr. 1977. The Audubon Society field guide to North American birds: Eastern region. Alfred A. Knopf, Inc., New York. 784 pp.

Dunning, J.B. 1993. Bachman's sparrow. *In* A. Poole, P. Stettenheim, and F. Gill, eds. The birds of North America, No. 38. The Academy of Natural Sciences, Philadelphia, and The American Ornithologists' Union, Washington, D.C.

Dunning, J.B., Jr., and B.D. Watts. 1990. Regional differences in habitat occupancy by Bachman's sparrow. Auk 107:463-472.

Ehrlich, P.R., D.S. Dobkin, and D. Wheye. 1992. Birds in jeopardy: the imperiled and extinct birds of the United States and Canada, including Hawaii and Puerto Rico. Stanford Univ. Press, California. 259 pp.

Hands, H.M., R.D. Drobney, and M.R. Ryan. 1989. Status of the Bachman's sparrow in the north central United States. Missouri Coop. Fish Wildl. Res. Unit Rep. 11 pp.

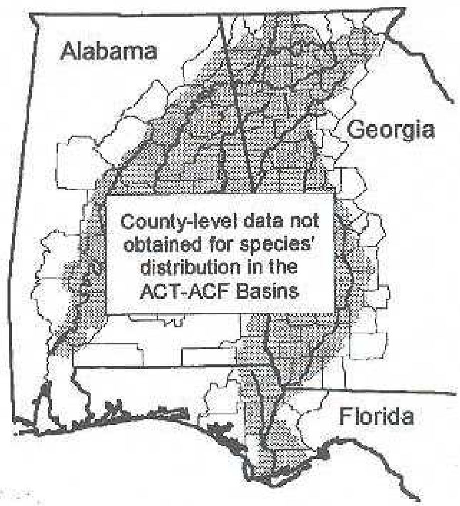
Hardin, K.I., and G.E. Progasco. 1983. The habitat characteristics and life requirements of Bachman's sparrow. Birding 15(4-5):189-197.

Imhof, T.A. 1976. Alabama birds, 2nd ed. Univ. of Alabama Press, Tuscaloosa, AL.

Terres, J.K. 1980. The Audubon Society encyclopedia of North American birds. Alfred A. Knopf, Inc. New York.

Teres, J.K. 1987. The Audubon Society encyclopedia of North American birds. Alfred A. Knopf, New York. 1109 pp.

Columbina passerina Common ground dove



Family Columbidae

Synonyms None

Legal Status Alabama state protected.

Reasons for Current Status Ground doves appear to be declining in the Southeast, although no causative agent has been identified.

Description A small, grayish, sparrow-sized dove. Tail is short, dark, and rounded. Wings show rufous color when in flight.

Distribution In the tri-state study area, ground doves occur locally as permanent breeding residents throughout the Coastal Plain, and are present but rare above the Fall Line. The species occurs throughout the southern and southwestern U.S. into Mexico.

Habitat Terrestrial/forest-wooodlands/scrub-shrub/grasslands/sand-barren. Prefers sandy, open areas such as roadsides, cultivated fields, sparse grasslands, and open pine woods.

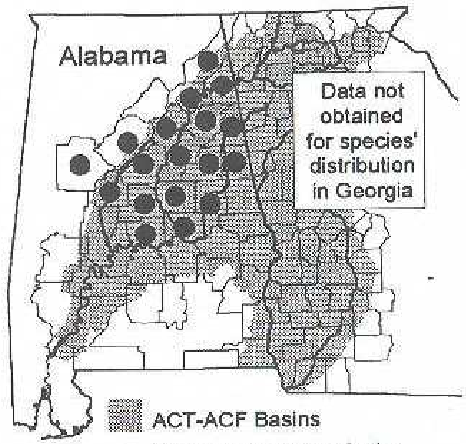
Other Biological Data Walks about, eating seeds of weeds, native grasses, and also insects. Often nests in a slight depression on the ground with little or no nest material, but will build a slight nest of twigs and grass in low bushes, vines, top of stumps or fences, or on low tree limbs.

Concerns Data are lacking, but some authorities have suggested that the decline of ground doves may be due to predation by the imported fire ant (*Solenopsis* sp.) at ground nests.

References

Imhof, T.A. 1976. Alabama birds, 2nd ed. Univ. of Alabama Press, Tuscaloosa, AL.
Keeler, J.E. 1986. Common ground dove, *Columbina passerina*. Pages 93-94 *in* R.H. Mount, ed. Vertebrate animals of Alabama in need of special attention. Ala. Agr. Expt. Sta., Auburn Univ.
Teres, J.K. 1987. The Audubon Society encyclopedia of North American birds. Alfred A. Knopf, New York. 1109 pp.

Dendroica cerulea — Cerulean warbler



Family Emberizidae

Synonyms None

Legal Status Federal species of concern.

Reasons for Current Status Declining numbers; requires large blocks of intact deciduous forest.

Description A 10- to 13-cm long warbler. The only blue-backed, white throated warbler (males).

Distribution Uppermost portions of ACT/ACF study area. Not likely to occur in Coastal Plain. Breeding range extends from Nebraska to Alabama.

Habitat Terrestrial/forest-wooodlands.

Other Biological Data Nests in tallest trees (to 27 m high). Requires large blocks of relatively undisturbed deciduous forest.

Concerns Logging of interior portions of hardwood forest.

References

Imhof, T.A. 1976. Alabama birds, 2nd ed. Univ. of Alabama Press, Tuscaloosa, AL.

Teres, J.K. 1987. The Audubon Society encyclopedia of North American birds. Alfred A. Knopf, New York. 1109 pp.

Falco sparverius paulus — Southeastern American kestrel

Family Falconidae

Synonyms None

Legal Status Federal species of concern; Florida threatened.

Reasons for Current Status Slow recovery in some parts of its range from DDT poisoning. In 1979, J.W. Wiley gave the reason for its status in Florida as a noticeable decline in the resident sub-species numbers in parts of Florida. The magnitude of decline was unknown, but was considered to be significant. At that time Wiley (1979) could not give any reason for the decline, only that it could possibly be from habitat destruction.

Description The smallest North American falcon: to 30 cm total length; head with black and white pattern with dark vertical marks; slender, pointed wings; rufous-red back and tail. Smaller and less spotted ventrally (males) than more northern races, which are migratory and may coexist with *F. s. paulus* in Florida outside of the breeding season.

Distribution The species *Falco sparverius* is found throughout North and South America. The sub-species, *Falco sparverius paulus*, is restricted to South Carolina south to southern Alabama and Florida (Wiley 1979:33). Breeding range extends from Louisiana (except coastal area), eastward through Mississippi, central Alabama, and southern Georgia to southern Florida. Winter range extends southward to the Gulf of Mexico in Louisiana and to Key West, Florida. (American Ornithologists' Union 1957).

Habitat Terrestrial/forest-wooodlands/scrub-shrub/grassland/sand-barren. Prefers borders of woodlands, open fields, pastures with scattered trees, highways.

Other Biological Data Eats insects almost exclusively. Nests in natural cavities and abandoned woodpecker holes. Also nests in holes in buildings or cliffs, and similar sites. Readily uses nest-boxes, which may dramatically increase density of nesting pairs in some areas (may use boxes put up for wood ducks). Rarely returns to breed in vicinity where reared, but breeders tend to return to their previous territories (Palmer 1988). Clutch size 3-7 (usually 4-5). Incubation mainly by female, usually accomplished in 29-31 days. Young are tended by both parents and leave nest in about 29-31 days. Fledglings may stay with parents for 2-4 weeks or more (no later than late summer). Females readily lay replacement clutch if first clutch is lost. Most first breed at 1 yr. Monogamy through successive breeding seasons seems to prevail (Palmer 1988).

Concerns Pesticides, loss of open areas, loss of mature cavity trees. Local populations of the southeastern kestrel may be affected by changes in water levels along rivers and streams, if preferred habitat is destroyed or altered. Secondary impacts of reservoir construction (e.g., residential development, fire suppression) may also affect kestrels.

References

American Ornithologists' Union. 1957. The A.O.U. Checklist of North American Birds, 5th ed. Port City Press, Inc., Baltimore, Maryland. 691 pp.

Imhof, T.A. 1976. Alabama birds, 2nd ed. Univ. of Alabama Press, Tuscaloosa, AL.

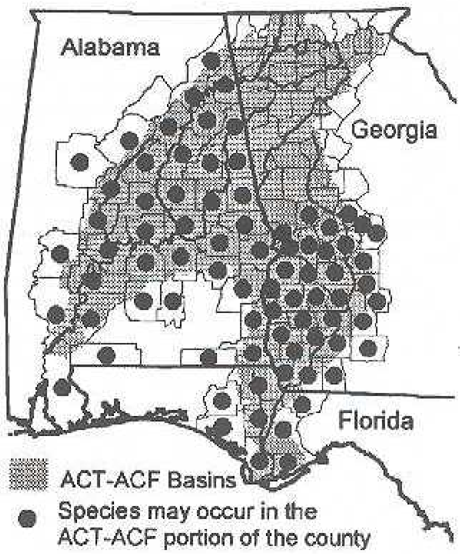
Palmer, R.S., ed. 1988. Handbook of North American birds. Vol. 5. Yale Univ. Press, New Haven. 465 pp.

Smallwood, J.A. 1987. Sexual segregation by habitat in American kestrels wintering in south-central Florida: vegetative structure and responses to differential prey availability. Condor 89:842-849.

Teres, J.K. 1987. The Audubon Society encyclopedia of North American birds. Alfred A. Knopf, New York. 1109 pp.

Wiley, J.W. 1979. Southeastern American kestrel. *In* H.W. Kale, II, ed. Rare and endangered biota of Florida, Vol. 2: Birds. Univ. Press of Florida, Gainesville.

Falco sparverius paulus **Southeastern American kestrel**



Haliaeetus leucocephalus **Bald eagle**

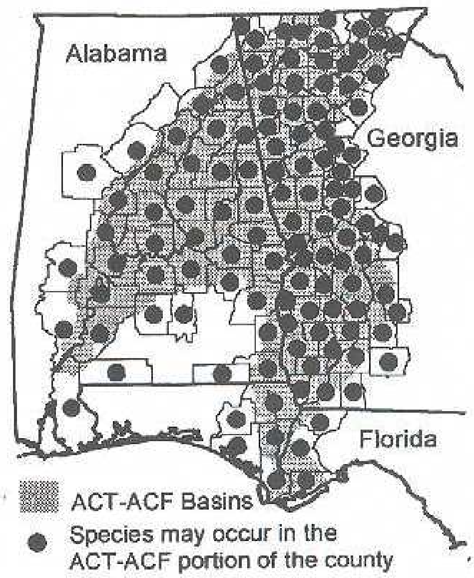
1970. Organochlorine and heavy metal residues in bald eagle eggs. Pest. Monit. J. 4:136-140.

Peterson, D.W. 1979. Bald eagle. Pages 27-30 *in* H.W. Kale, II, ed. Rare and endangered biota of Florida, Vol. 2: Birds. Univ. Press of Florida, Gainesville.

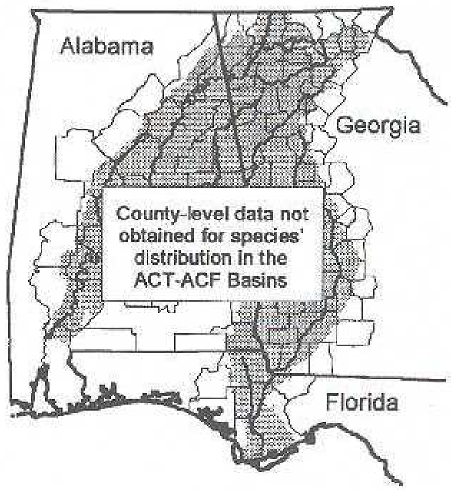
Radcliffe, D.A. 1967. Decrease in eggshell weight in certain birds of prey. Nature, 215:208-210.

Teres, J.K. 1987. The Audubon Society encyclopedia of North American birds. Alfred A. Knopf, New York. 1109 pp.

U. S. Fish and Wildlife Service. 1989. Southeastern states bald eagle recovery plan. U. S. Fish and Wildlife Service, Atlanta, Georgia.



Laterallus jamaicensis Black rail



Family Rallidae

Synonyms *Laterallus jamaicensis pygmaeus, Creciseus jamaicensis*

Legal Status Federal species of concern.

Reasons for Current Status The habitat of the black rail has been (and is being) destroyed by diking, draining, and other types of development near brackish and salt water marshes.

Description The black rail is a small rail, about the size of a large sparrow. It is blackish above, with a brown nape and small white spots and streaks on the sides and underparts. The beak is black and short. The eyes are dark red in color (Sykes 1982:114; National Geographic Society 1983:98).

Distribution The black rail is known to occur along the eastern coast of the United States and inland to Iowa and Kansas. In Florida it is known to winter and breed in coastal marshes and inland.

Habitat Estuarine; Palustrine. The black rail primarily occurs in the upper reaches of the tidal salt and brackish marsh with a wide range of vegetation. It occurs less frequently in fresh water marshes, moist meadows, or other damp spots. (Sykes 1982:114; Hamel 1992:139)

Other Biological Data Unknown

Concerns "Habitat is being lost due to dredge and fill operations, drainage, highway rights-of-way, housing developments, recreational facilities, municipal dumps, industrial development, and other human activity" (Sykes 1982:114).

References

Sykes, P.W. jr. 1978. Black rail. Pages 114-115 *in* H.W. Kale, II, ed. Rare and endangered biota of Florida, Vol. 2: Birds. Univ. Press of Florida, Gainesville.

National Geographic Society. 1983. Field guide to the birds of North America. National Geographic Society. Washington, D.C. 464 pp.

Hamel, P.B. 1992. Land manager's guide to the birds of the south. The Nature Conservancy, Southeastern Region, Chapel Hill. 437 pp.

Mycteria americana Wood stork

Family Ciconiidae

Synonyms None

Legal Status Federal endangered (49 FR 7335, February 28, 1984); Alabama state protected; Georgia endangered; Florida endangered.

Not designated

Reasons for Current Status The loss of foraging and breeding habitat has reduced the wood stork population. It once nested along the Atlantic and Gulf coasts from South Carolina to Texas. At the time of listing most wood storks in the U.S. were breeding in the Everglades and presently there are usually fewer than 300 pairs breeding in all of south Florida. Colony sizes and numbers have been increasing outside of South Florida, it appears as though water mismanagement in South Florida has caused the wood stork to move to more suitable locations.

Description A large, long-legged wading bird with a long, heavy bill. The head and upper neck lack feathers, with exposed dark gray skin. Body feathers are white, but the flight feathers are black, giving the entire rear margin of the wing a broad black margin.

Distribution The breeding range extends from South Carolina to Florida along the Atlantic Seaboard, parts of the Gulf Coast and the Greater Antilles, both coasts of Mexico and Central America, and most of the interior of South America down to Argentina.

In Florida, wood storks breed in central and north Florida and are nomadic with no detectable pattern in their seasonal movements (Rodgers 1994, pers. comm.). Several authors have noted a distinct movement of range out of south Florida and increases in colony size and numbers of colonies in north Florida, Georgia, and South Carolina (Frederick 1994, pers. comm.).

Non-nesting birds are seen throughout southern Georgia and up into the Piedmont. There are no known rookeries within the ACT-ACF drainage, but foraging storks are commonly seen along the lower Chattahoochee and Flint River drainages where they forage in associated wetlands.

Habitat Palustrine/forested/emergent; Lacustrine. Wood storks feed chiefly in freshwater ponds and marshes, preferring areas where water levels are dropping and fish become concentrated and trapped in isolated pools. For successful reproduction, the base of the nest tree must remain submerged throughout nesting. Otherwise, predation by raccoons can be a big problem.

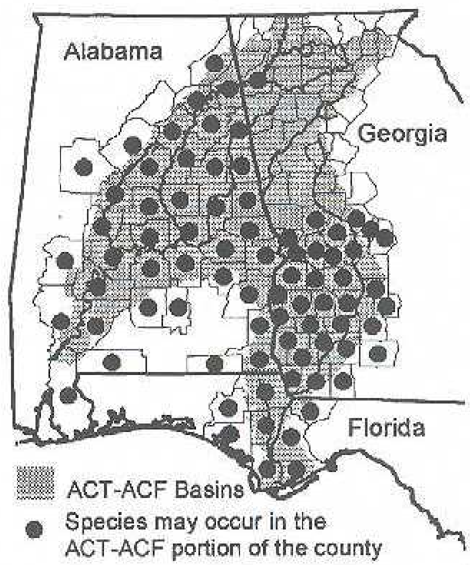
Other Biological Data Most prey are taken by groping about in isolated pools. Prey includes fish (up to 25 cm in length), crayfish, mollusks, young alligators, turtles, rodents, and small birds. Hydrologic conditions are important to both foraging and nesting. A constant water level may be beneficial to nesting (flooding reduces predation) while the dynamics that produce prey vary from area to area (P. Frederick 1994, pers. comm).

The U.S. population has declined from about 10,000 nesting pairs in 1960 to about 5,000 in 1993. South Florida was the storks' stronghold until recent years when alterations in hydrology of the Everglades and other wetlands decreased prey availability. Most nesting now occurs in central and north Florida and south Georgia. Some birds also nest in South Carolina.

Wood storks mature at 4-5 years and nest in groups of less than 10 pairs to more than 500 pairs. Within a colony, nesting chronology varies significantly, with egg-laying occurring over a period of several weeks. A typical clutch contains 3 eggs, and during years of suitable environmental conditions, almost all of the offspring might survive to fledging. However, severe drought that results in drying of the rookery site usually results in extensive nest failure due to raccoon predation. Food supplies might also be affected by severe drought. Severe storms or other disturbances can result in nest abandonment.

Concerns Wood storks could be adversely affected by artificial alteration of flow regimes in the ACT/ACF area. The species is very sensitive to water level fluctuations of its foraging habitat, requiring shallow waters where prey are concentrated. Both flooding and drought can cause abandonment of a site. Reduction of flow can cause shallow wetlands associated with river systems to become dry, eliminating significant areas of foraging habitat.

Mycteria americana Wood stork



References

Bentzien, M.M. 1986. Recovery plan for the U.S. breeding population of the wood stork. U. S. Fish and Wildlife Service, Atlanta, Georgia. 38 pp.

Bull, J., and J. Farrand, Jr. 1977. The Audubon Society field guide to North American birds: Eastern region. A.A. Knopf, New York. 784 pp.

Dusi, J.L. 1986. Wood Stork, *Mycteria americana* Linnaeus. Pages 74-75 *in* R.H. Mount, ed. Vertebrate animals of Alabama in need of special attention. Ala. Agr. Expt. Sta., Auburn Univ.

Imhof, T.A. 1976. Alabama birds, 2nd ed. Univ. of Alabama Press, Tuscaloosa, AL.

Teres, J.K. 1987. The Audubon Society encyclopedia of North American birds. Alfred A. Knopf, New York. 1109 pp.

Picoides borealis Red-cockaded woodpecker

Family Picidae

Synonyms None

Legal Status Federal endangered (35 FR 1047, October 13, 1970); Alabama state protected; Georgia endangered; Florida threatened.

Not designated

Reasons for Current Status Population declines due to loss of mature, frequently burned pine forest, which is necessary habitat. Remaining habitat in Georgia is mostly on government-owned land (Fort Benning, Fort Stewart, Okefenokee National Wildlife Refuge, Piedmont National Wildlife Refuge/Hitchiti/Oconee National Forest) and the privately owned quail plantations of the Redhills Region in Grady and Thomas counties. Scattered small relict tracts of occupied habitat are left on private land in the Coastal Plain, but these are disappearing.

Description Length 18.4 cm. A black and white barred back, black-flecked flanks, and large white cheek patch distinguish this bird from other similar woodpeckers. The male has a tiny red patch, or cockade, on the side of the head that is visible only when the bird is excited.

Distribution Still found in the southeastern coastal states from eastern Texas to southern Virginia, and also in Oklahoma, Arkansas, Tennessee, and Kentucky. Largest populations and best remaining habitat is found in the Coastal Plain of North Carolina, South Carolina, Florida, Georgia, Alabama, Mississippi, Louisiana, and eastern Texas, and the Sandhills of North and South Carolina.

Historic distribution in Georgia probably encompassed the Coastal Plain, most of the Piedmont, and some of the Ridge and Valley physiographic provinces. Present known distribution is restricted to the Coastal Plain and lower Piedmont. A significant population inhabits Fort Benning in Chattahoochee County. Other known groups within the ACT-ACF study area are isolated on private land. Another significant population exists in Grady and Thomas counties, just outside of the study area.

Habitat Terrestrial. Red-cockaded woodpeckers nest only in mature pine trees, typically those infected with red heart fungus that softens the heartwood. Nest trees are typically at least 95 years old for longleaf pine and 75 years old for others; longleaf seems to be preferred. Foraging occurs in surrounding pine and pine-hardwood forests, with larger pines (>25 cm dbh) preferred. Most foraging occurs within 0.8 km of cavity trees. An average of about 50 ha of suitable foraging habitat is required for each group of birds, depending on tree size, stocking density, etc.

Other Biological Data Red-cockaded woodpeckers are cooperative breeders. They live in groups that consist of only 1 breeding pair, and typically 1-3 helpers. The helpers are usually male offspring from previous years. One of these helpers might inherit the breeding territory if the breeding male dies or leaves. Female offspring disperse during their first year and might pair with bachelor males they encounter.

Concerns Loss and degradation of habitat continue to cause problems for these birds. Unmanaged habitat tends to become unsuitable because lack of fire results in a heavy hardwood mid-story that the birds find unacceptable. Modern forestry practices do not encourage maintenance of mature pine forests. Short rotation plantations are the norm for higher fiber yield.

Various water management alternatives should have little or no effect on red-cockaded woodpeckers. They are found in upland habitats not directly ecologically associated with river corridors.

References

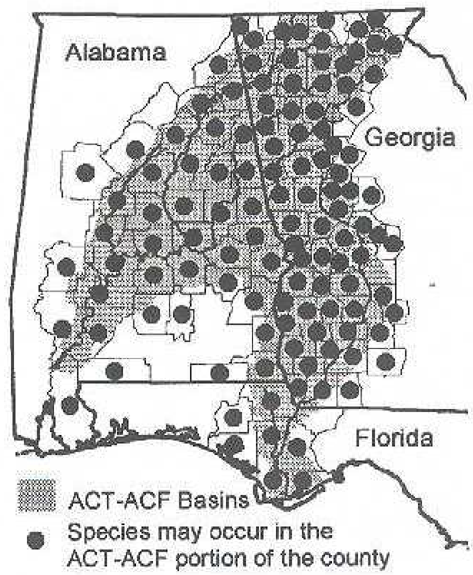
Imhof, T.A. 1976. Alabama birds, 2nd ed. Univ. of Alabama Press, Tuscaloosa, AL.

Keeler, J.E. 1986. Red-cockaded Woodpecker, *Picoides borealis* (Viellot). Pages 78-79 *in* R.H. Mount, ed. Vertebrate animals of Alabama in need of special attention. Ala. Agr. Expt. Sta., Auburn Univ.

Teres, J.K. 1987. The Audubon Society encyclopedia of North American birds. Alfred A. Knopf, New York. 1109 pp.

Picoides borealis Red-cockaded woodpecker

U. S. Fish and Wildlife Service. 1985. Red-cockaded woodpecker recovery plan. Atlanta, Georgia. 88 pp.



Thryomanes bewickii altus — Appalachian Bewick's wren

Family Troglodytidae

Synonyms None

Legal Status Federal species of concern; Alabama state protected.

Reasons for Current Status Drastic reduction in range since 1960. Pesticide usage, competition, and forest succession on formerly cleared lands have been identified as possible reasons for the decline.

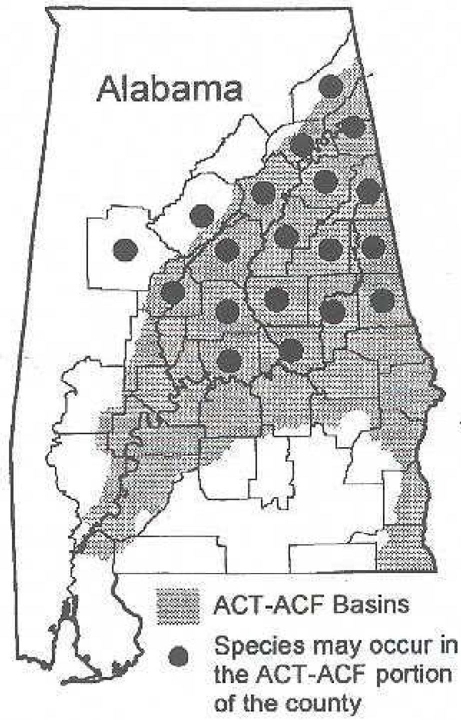
Description A large wren, 13 cm long, reddish brown above and whitish below with a white stripe above the eye and a dark brown line through the eye. Resembles the Carolina wren, except that it lacks the buff belly and has white side spots on its long up-tilted tail.

Distribution Formerly bred as far south as the Fall Line (Prattville, Autauga County) in Alabama. Since about 1960, mainly restricted to the Tennessee Valley and the Ridge and Valley physiographic provinces in Alabama.

Habitat Terrestrial/forest-wooodland/grasslands. Most often frequents houses, especially old barns, sheds, fence-rows, hedge-rows, orchards, and thickets.

Other Biological Data Often frequents the same areas as house wrens, and the two species are intolerant of each other. One species is invariably driven away. Nests in cavities, from late March to July.

Concerns Little is known about its natural history in Alabama (pers. comm. Dan Holliman 1994).



References

Imhof, T.A. 1976. Alabama birds, 2nd ed. Univ. of Alabama Press, Tuscaloosa, AL.

Imhof, T.A. 1986. Bewick's Wren, *Thryomanes bewickii* (Audubon). Pages 82-83 *in* R.H. Mount, ed. Vertebrate animals of Alabama in need of special attention. Ala. Agr. Expt. Sta., Auburn Univ.

Teres, J.K. 1987. The Audubon Society encyclopedia of North American birds. Alfred A. Knopf, New York. 1109 pp.

Geomys pinetis — Southeastern pocket gopher

Family Geomyidae

Synonyms *Geomys tuza*

Legal Status Alabama state protected.

Reasons for Current Status In Alabama, the species has disappeared from Tuscaloosa and Bibb counties, and it appears to have been extirpated from other formerly inhabited areas. Other subspecies in Georgia have become extinct.

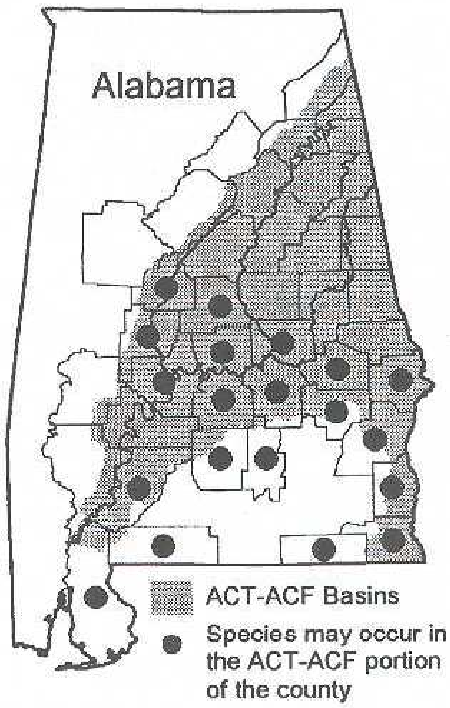
Description A medium-sized rodent with small eyes and ears, a bare tail, short fur, small hind limbs, and large fore limbs with elongated front claws. Fur color is brown above and buff below.

Distribution *G. pinetis* occurs in the Coastal Plain from the Black Warrior and Tombigbee rivers in Alabama eastward to the Savannah River in Georgia. Its range extends southward into most of the Florida peninsula.

Habitat Terrestrial/forest-wooodlands/scrub-shrub/grasslands. Deep-well-drained sandy soils along roadsides, in open pine or pine/hardwood forests, and in fields.

Other Biological Data Pocket gophers have a low reproductive rate and a limited ability to disperse, making it difficult to recolonize areas after extirpation. Of approximately 80 species of arthropods reported from pocket gopher burrows, 14 are apparently unable to exist elsewhere.

Concerns Habitat loss to development, agriculture, and certain silvicultural practices. Fragmentation of populations by roads and other habitat losses.



References

Burt, W.H., and R.P. Grossenheider. 1976. A field guide to the mammals. Peterson Field Guide No. 5, 3rd ed. Houghton Mifflin Co., Boston. 289 pp.

French, T.W. 1986. Southeastern pocket gopher, *Geomys pinetis*. Page 115 *in* Mount, R.H., ed. Vertebrate animals of Alabama in need of special attention. Ala. Agr. Expt. Sta., Auburn Univ. 124 pp.

Mustela frenata olivacea

Southeastern weasel

Family Mustelidae

Synonyms *Mustela peninsulae olivacea*

Legal Status Alabama state protected (as long-tailed weasel).

Reasons for Current Status Considered scarce in Alabama.

Description A small mustelid, with pelage chestnut brown dorsally and yellowish-white ventrally. Chin and upper lips are white. The terminal two-thirds of the tail is black.

Distribution The subspecies *M. f. olivacea* ranges from southern North Carolina west to eastern Mississippi and south to the northern third of peninsular Florida. The species is widespread throughout North America.

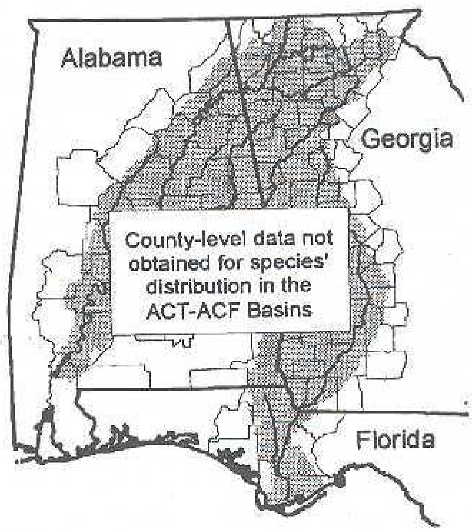
Habitat Terrestrial/forest-wooodlands/scrub-shrub; Palustrine/forested. Specific habitat preferences are not known, and this weasel can be expected to occur wherever food and shelter are adequate. Weasels are known to use hollow trees, burrows, and the burrows of other animals, including gopher tortoises (*Gopherus polyphemus*) and southeastern pocket gophers (*Geomys pinetis*).

Other Biological Data As far back as 1921, A.H. Howell considered this weasel to be "scarce everywhere in the Southern States". Perceived rarity led to this species being recently reclassified from a furbearer to a nongame species in Alabama.

Concerns No specific concerns have been identified, but losses of various habitat types are undoubtedly having some adverse effect.

References

Burt, W.H., and R.P. Grossenheider. 1976. A field guide to the mammals. Peterson Field Guide No. 5, 3rd ed. Houghton Mifflin Co., Boston. 289 pp.
Howell, A.H. 1921. North American Fauna No. 45: A biological survey of Alabama. I. physiography and life zones. II. the mammals. U. S. Government Printing Office, Washington, D.C.
Frank, P.A. 1992. Southeastern weasel, *Mustela frenata olivacea*. Pages 310-314 *in* Humphrey, S.R., ed. Rare and endangered biota of Florida, Vol. I: Mammals. Univ. Press of Florida, Gainesville.



Myotis austroriparius

Southeastern myotis

Family Vespertilionidae

Synonyms None

Legal Status Federal species of concern; Alabama state protected.

Reasons for Current Status Populations of the southeastern myotis have apparently experienced recent declines. Reasons for the decline include the following impacts to caves: improper gating or entrance closure, disturbance by humans, flooding, sedimentation, and clear-cutting the surrounding forest (Gore and Hovis 1992).

Status is poorly known in Alabama and Florida (Humphrey 1992:337-338). In Georgia, it is considered uncommon, but this assessment may reflect a lack of collection effort.

Description A relatively large bat, the southeastern myotis has dull brown, wooly fur and a pink face. Hair on the belly is pale gray, tan, or white. Total length 84-96 mm; tail 36-44; hind foot 10-12.5 mm; forearm 36-42 mm; weight 5-7 g. Females are slightly larger than males. The calcar is not keeled, and the wing membrane attaches to the base of the toe. The hair on the feet is long, extending well beyond the tips of the toes. Some individuals are yellowish-brown (Webster et al. 1985).

Distribution The range of the southeastern myotis is from North Carolina west to Texas and southeastern Oklahoma. Occurs northward to western Kentucky.

In Florida, it occurs in the peninsula and throughout the panhandle. There are no known occurrences within the study area in Alabama. Summer roosts are known from southern Alabama, and several specimens have been collected from caves in northern Alabama in fall and winter. In Georgia, maternity colonies may be restricted primarily to the karst regions of the southwestern portion of the state where suitable caves can be found. Individuals can be found statewide except along the tier of counties bordering South Carolina (Laerm 1981). Probably uncommon in the southern part of the state.

Habitat Subterranean; Terrestrial; Riverine; Lacustrine; Palustrine. Hibernates in small numbers in manmade structures, caves, and hollow trees, usually near water. Summer roost sites are usually caves, rarely in buildings. Apparently, maternity colonies are usually in caves, generally those containing standing water; suitable maternity caves reportedly contain an expanse of horizontal ceiling at least 6 ft above permanent bodies of water. If no such sites are available, southeastern bats may use buildings, old mine shafts, cisterns, culverts, or hollow trees. The relative importance of cave versus non-cave roosts is not well known.

Other Biological Data Foraging is typically over water (beaver ponds, large streams, impoundments). Unlike other *Myotis* bats of North America which have single young, about 90 percent of *M. austroriparius* females produce twins.

In the early 1990's, there were only 3 known maternity caves, each housing several thousand adults, outside of Florida. Florida has at least 18 current or former maternity caves which, in past years, potentially contained a total of 400,000 adult females; a 1991 survey found only 8 maternity caves with less than 200,000 adult females (Gore and Hovis 1992). Suitable sites for maternity colonies may be declining as caves and abandoned buildings are impacted by land use changes.

Concerns Human disturbance at cave sites, including destruction or alteration of caves, loss of riparian habitat, poisoning from pesticides, deliberate eradication attempts, and demolition of abandoned buildings. Reservoir development can result in loss of suitable habitat through inundation of caves. Changes in land use that result in loss of summer roost sites, increased sedimentation of caves, or loss of insect prey would adversely affect this species.

References

Burt, W.H., and R.P. Grossenheider. 1976. A field guide to the mammals. Peterson Field Guide No. 5, 3rd ed. Houghton Mifflin Co., Boston. 289 pp.

Gore, J.A., and J.A. Hovis. 1992. The southeastern bat: another cave-roosting species in peril. Bats 10(2):10-12.

Harvey, M.J. 1992. Bats of the eastern United States. Arkansas Game and Fish Commission. 46 pp.

Myotis austroriparius **Southeastern myotis**

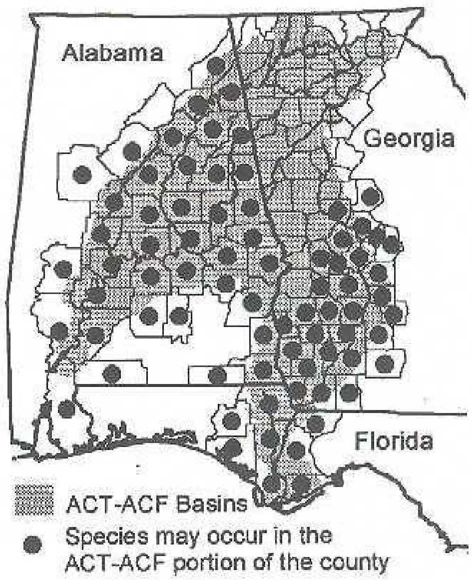
Humphrey, S.R. 1992. Rare and endangered biota of Florida, Vol. 1: Mammals. Univ. Press of Florida, Gainesville.

Jordan, J.R. Southeastern myotis, *Myotis austroriparius* Rhoads. Pages 111-112 *in* Mount, R.H., ed. Vertebrate animals of Alabama in need of special attention. Ala. Agr. Expt. Sta., Auburn Univ. 124 pp.

Laerm, J. 1991. A survey of the status, distribution, and abundance of potentially threatened and endangered vertebrate species in Georgia, Part IV: The mammals. Unpub. report. 161 pp.

Rice, D.W. 1957. Life history and ecology of *Myotis austroriparius* in Florida. J. Mamm. 38:15-32.

Webster, D.M., J.E. Parnell, and W.C. Biggs, Jr. 1985. Mammals of the Carolinas, Virginia, and Maryland. Univ. of North Carolina Press, Chapel Hill. 255 pp.



Myotis grisescens Gray bat

Family Vespertilionidae

Synonyms None

Legal Status Federal endangered (41 FR 17740, April 28, 1976); Alabama state protected; Georgia endangered; Florida endangered.

Critical Habitat Not designated

Reasons for Current Status Human disturbance and vandalism have been the primary cause for the decline. This species is especially vulnerable because of high fidelity to particular caves. About 95% of the known population hibernates in 9 caves, over 50% of these in one cave. Other factors which contributed to the decline included pesticide poisoning, natural calamities such as flooding and cave-ins, loss of caves due to inundation by man-made impoundments, and possibly a reduction in insect prey over streams that have been degraded through excessive pollution and siltation. Improper cave gating or cave commercialization have also contributed to some population declines. (U. S. Fish and Wildlife Service 1992)

Description A large *Myotis*. Total length 80-105 mm, hind foot 9-12 mm; ear length 14-16 mm; wingspread 275-300 mm, weight 7-14 g. Most likely to be confused with *M. lucifugus*, *M. austroriparius*, *M. sodalis*, and *M. septentrionalis*. Recognized from these by uniform-colored dorsal fur from base to tip (all others have contrasting bi- or tri-colored dorsal fur) and by attachment of wing membranes at ankle, not base of toe.

Distribution The range of the gray bat is mainly in Alabama, northern Arkansas, Kentucky, Missouri, and Tennessee, but a few occur in northwestern Florida, western Georgia, and other southeastern states. (U. S. Fish and Wildlife Service 1992)

In Florida, major colonies only have been found in Jackson County caves. Small colonies have been reported from some of the counties surrounding Jackson County (Gore 1992:65-66). Within the study area in Alabama, known occurrences include one cave in Shelby County (Cahaba River drainage) and two caves in DeKalb County (Coosa River drainage). Additional populations are known from northwestern Georgia, presumably from within the Coosa drainage. In Georgia, known only from 2 caves in Polk County, 1 in Chattooga County, and from the University of Georgia football stadium tunnel in Athens (Baker 1965). The Polk County and Clarke County records are of transient individuals; additional searches at these sites have not been productive (Laerm 1981). The Chattooga County cave is apparently a bachelor cave. No maternity caves are known to exist in the state.

Habitat Terrestrial/forest-woodland; Subterranean; Riverine; Palustrine; Lacustrine. More restricted to caves than any other U.S. mammal. Roosts year-round in caves or cave-like structures. Summer caves are nearly always located within 1 km of rivers and reservoirs over which the bats forage. Gray bats do not feed in areas along rivers or reservoirs where the forest has been cleared. (Gore 1992:66-67; U. S. Fish and Wildlife Service 1992)

This bat prefers air temperatures of 6-9 C° for hibernation; caves with suitable winter conditions apparently are relatively rare. Wintering caves may be hundreds of kilometers from summer caves. Large summer colonies utilize caves which trap warm air and provide restricted rooms or domed ceilings; does not breed in caves with air temperature below 13 C°. Maternity caves often have a stream flowing through them. Maternity caves are separate from the caves used in summer by males.

Other Biological Data Nine winter caves support approximately 95 percent of the entire population during hibernation. Over one-half of the population hibernates in a single cave in the Tennessee Valley in Alabama.

Total population was estimated at 1.5 million in the early 1980's. By 1990, the range-wide population was stable and perhaps growing, apparently because of successful cave protection efforts (U. S. Fish and Wildlife Service 1990). Gray bats have responded well to management.

Evidence suggests that gray bats migrate in small groups (Barbour and Davis 1969); small caves along the migration route may be used as rest stops. The migration to winter caves occurs in September and October.

Myotis grisescens **Gray bat**

Feeds mostly upon mayflies and the flying stages of other aquatic insects. Usually forages over water at heights of 2-3 meters. No information is available on Georgia food habits. Gray bat mortality has been linked to dieldrin acquired through insect food supply (Clark et al. 1978).

Mortality is especially high in spring migration, when fat reserves and food supply are low. Mean annual survival rate in undisturbed caves is approximately 70%. Yearlings and adult males segregate into nomadic summer colonies that tend to roost in caves within a few miles of ones used by adult females (Layne 1978). Adults first breed in second year.

Forested areas along the banks of streams and lakes provide important protection for adults and young (Tuttle 1979). Young gray bats often feed and take shelter in forest areas near the entrance to cave roosts.

Concerns Human disturbance at cave sites is the primary concern. Activities that threaten gray bats include intrusion by cave visitors, cave commercialization, vandalism, deliberate eradication attempts, over-collection of specimens, and improper gating or fencing of cave entrances.

Impoundment of waterways, channelization, water pollution, and siltation can cause loss of foraging habitat and/or roosting habitat. Persistent pesticides such as dieldrin and heptachlor are also serious threats (Clark et al. 1978).

References

Baker, W.W. 1965. A contribution to the knowledge of the distribution and movement of bats in north Georgia. M.S. thesis. Univ. of GA. 121 pp.

Barbour, R.W., and W.H. Davis. 1969. Bats of America. Univ. Press of Kentucky, Lexington. 286 pp.

Brack, V., Jr., R.E. Mumford, and V.R. Holmes. 1984. The gray bat (*Myotis grisescens*) in Indiana. Am. Midl. Nat. 111:205.

Burt, W.H., and R.P. Grossenheider. 1976. A field guide to the mammals. Peterson Field Guide No. 5, 3rd ed. Houghton Mifflin Co., Boston. 289 pp.

Clark, D.R., R.K. Laval, and D.M. Swineford. 1978. Dieldrin induced mortality in an endangered species, the gray bat (*Myotis grisescens*). Science 199(4335):1357-1359.

Evans, J.E., N. Drilling, and R.L. Henson. 1992. Element stewardship abstract for *Myotis grisescens*. The Nature Conservancy, Arlington, Virginia.

Gore, J.A. 1992. Gray bat. Pages 62-70 *in* Humphrey, S.R., ed. Rare and endangered biota of Florida, Vol. I: Mammals. Univ. Press of Florida, Gainesville.

Harvey, M.J. 1992. Bats of the eastern United States. Arkansas Game and Fish Commission. 46 pp.

Jordan, J.R. 1986. Gray bat, *Myotis grisescens* Howell. Pages 106-107 *in* R.H. Mount, ed. Vertebrate animals of Alabama in need of special attention. Ala. Agr. Expt. Sta., Auburn Univ.

Laerm, J. 1981. A survey of the status, distribution, and abundance of potentially threatened and endangered vertebrate species in Georgia, Part IV: The mammals. Unpub. report. 161 pp.

Laval, R.K., R.L. Clawson, M.L. LaVal, and W. Claire. 1977. Foraging behavior and nocturnal activity patterns of Missouri bats, with emphasis on the endangered species *Myotis grisescens* and *Myotis sodalis*. J. Mammal. 58:592-599.

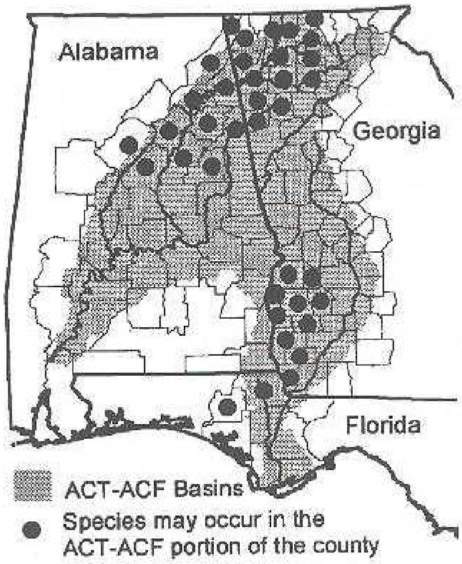
Layne, J.N., ed. 1978. Rare and endangered biota of Florida, Vol. 1: Mammals. State of Florida Game and Freshwater Fish Commission. 52 pp.

Tuttle, M.D. 1979. Status, causes of decline, and management of endangered gray bats. J. Wildl. Manage. 43:1-17.

U. S. Fish and Wildlife Service. 1990. Endangered and threatened species recovery program: report to Congress. 406 pp.

U. S. Fish and Wildlife Service. 1992. Endangered and threatened species of the southeast United States (the red book). Atlanta, Georgia. 1070 pp.

Myotis grisescens Gray bat



Plecotus rafinesquii Rafinesque's big-eared bat

Family Vespertilionidae

Synonyms This species referred to as *Corynorhinus macrotis* in older literature, while *Plecotus townsendii* was known as *C. rafinesquii*. No current synonyms known for this species.

Legal Status Federal species of concern; Alabama state protected; Georgia rare.

Reasons for Current Status This species apparently has never been considered abundant anywhere in its range. Remarkably, little is known of the biology of *Plecotus rafinesquii*. The widely scattered and irregular occurrence of this species makes documentation of its status difficult, if not impossible. This species often roosts in semi-lighted structures and accessible cave entrances, making it subject to disturbance from humans (Laerm 1981).

In Alabama, there are very few known occurrences. Extensive surveys undertaken in 1979 and 1980 in Georgia suggest that populations are in decline. This may be due to habitat alteration and changing land use patterns (Laerm et al. 1980). In Florida, the southern most part of its range, few populations are known and no breeding has been recorded, which led Jennings (1958 cited in Belwood 1992) to doubt that the state hosts a functional population.

Description A medium sized bat, wingspan 265-301 mm; ears large (>25 mm). Color: dark gray to brown above, whitish below. Snout with two conspicuous dorsolateral lumps.

Distribution The range is throughout the Atlantic and Gulf coastal states from Virginia to Texas and southeastern Oklahoma. Range extends northward through Kentucky, southern Illinois, Indiana, Ohio, and West Virginia.

It occurs throughout the Florida panhandle (Belwood 1992:288-289). In Alabama, it occurs throughout the ACT/ACF study area, locally distributed. In Georgia, *P. r. macrotis* is known from the mountains and foothills of North Georgia, and *P. r. rafinesquii* from the lower Coastal Plain. May occur statewide; however, there are no records from the Piedmont and only 1 record from the upper Coastal Plain (Grady County).

Habitat Terrestrial/forest-woodlands; Subterranean. Maternity colonies, consisting of a few dozen adults, are usually found in abandoned buildings. Readily roosts in semi-lighted situations such as cave entrances, hollow trees, buildings, wells, and bridges (Layne 1978; Laerm 1982). Roosting habitat for males in summer is usually buildings or hollow trees. Foraging habitat is among the high branches of large trees.

Other Biological Data There are two subspecies of Rafinesque's big-eared bat. The subspecies *P. r. rafinesquii* is found mainly in the Ohio and Tennessee River valleys and in the Southern Appalachians. While the *P. r. macrotis* subspecies is found in the lower Atlantic and Gulf drainages and to a limited extent in the adjacent Piedmont (Handley 1991).

Often roosts with other bats (*Pipistrellus subflavus*, *Myotis austroriparius*). Roosts singly, in small clusters, or in larger groups of up to 100 or more. In most colonies, females outnumber males. Males mainly solitary during nursing season. When disturbed, awakens quickly and takes flight almost immediately (Layne 1978). Predators include snakes and small carnivores.

Concerns Destruction of old buildings and cutting of den trees eliminates roost sites. Pesticides may have played a role in the apparent decline.

References

Belwood, J.J. 1992. Rafinesque's big-eared bat. Pages 287-293 *in* Humphrey, S.R., ed. Rare and endangered biota of Florida, Vol. I: Mammals. Univ. Press of Florida, Gainesville.

Burt, W.H., and R.P. Grossenheider. 1976. A field guide to the mammals. Peterson Field Guide No. 5, 3rd ed. Houghton Mifflin Co., Boston. 289 pp.

Golley, F.B. 1962. Mammals of Georgia: A study of their distribution and functional role in the ecosystem. Univ. of Georgia Press, Athens. 218 pp.

Handley, C.O., Jr. 1991. Mammals. Pages 539-616 *in* K. Terwilliger, coordinator. Virginia's endangered species: proceedings of a symposium. McDonald and Woodward Publ. Co., Blacksburg, Virginia.

Plecotus rafinesquii **Rafinesque's big-eared bat**

Harvey, M.J. 1992. Bats of the eastern United States. Arkansas Game and Fish Commission. 46 pp.

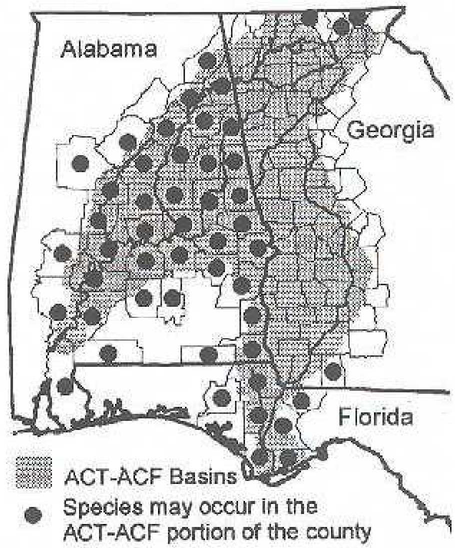
Jordan, J.R. 1986. Rafinesque's big-eared bat, *Plecotus rafinesquii* Lesson. Pages 112-113 *in* Mount, R.H., ed. Vertebrate animals of Alabama in need of special attention. Ala. Agr. Expt. Sta., Auburn Univ. 124 pp.

Laerm, J. 1981. A survey of the status, distribution, and abundance of potentially threatened and endangered vertebrate species in Georgia, Part IV: The mammals. Unpub. report. 161 pp.

Laerm, J., B.J. Freeman, L.J. Vitt, J.M. Meyers, and L.E. Logan. 1980. Vertebrates of the Okefenokee Swamp. Brimleyana 4:47-73.

Layne, J.N., ed. 1978. Rare and endangered biota of Florida, Vol. 1: Mammals. State of Florida Game and Freshwater Fish Commission. 52 pp.

Whitaker, J.O., Jr. 1980. The Audubon Society field guide to North American mammals. Alfred A. Knopf, Inc., New York. 745 pp.



Tadarida brasiliensis — Brazilian free-tailed bat

Family Molossidae

Synonyms *T. mexicana*

Legal Status Alabama state protected.

Reasons for Current Status At the time of listing as "Special Concern" in Alabama (1983), no recently verified occurrences were known in the state. It has since been found to be more common than previously thought.

Description A large bat, with wingspan 290-325 mm. Fur is dark brown to dark gray, and velvety. Distal half of tail not joined to interfemoral membrane. Facial area and snout black. Ears roughly triangular and leathery, almost touching in the middle of forehead.

Distribution Throughout the ACT/ACF study area, but only locally. Occurs in Atlantic and Gulf coastal states from North Carolina to Louisiana and Texas.

Habitat Terrestrial/forest-woodlands. Roosting habitat in the study area is buildings and other manmade structures. In the southwestern U.S. the species roosts in caves. Foraging habitat includes forest edges, open areas, and areas over lakes and ponds.

Other Biological Data Feeds almost exclusively on small moths. Unlike other bats in this area, free-tailed bats mate in early spring before leaving their hibernacula.

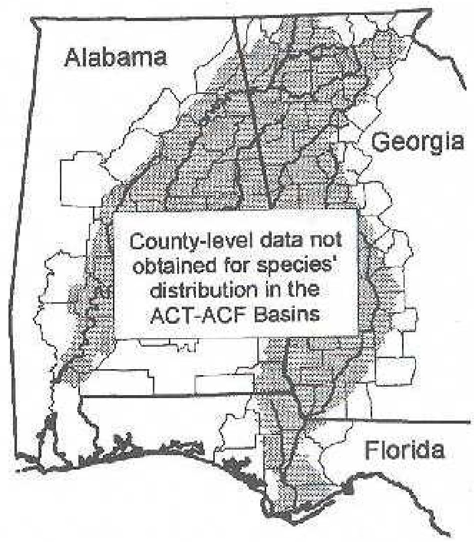
Concerns Loss of manmade roosting habitats through modern construction of "bat-proof" buildings and the gradual disappearance of older structures. Pesticides may be a threat.

References

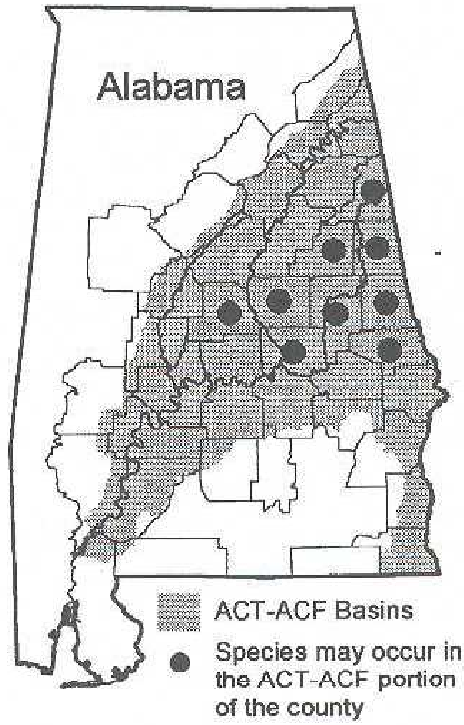
Burt, W.H., and R.P. Grossenheider. 1976. A field guide to the mammals. Peterson Field Guide No. 5, 3rd ed. Houghton Mifflin Co., Boston. 289 pp.

Jordan, J.R. 1986. Brazilian free-tailed bat, *Tadarida brasiliensis* (Geof. St.-Hilaire). Pages 113-114 *in* Mount, R.H., ed. Vertebrate animals of Alabama in need of special attention. Ala. Agr. Expt. Sta., Auburn Univ. 124 pp.

Harvey, M.J. 1992. Bats of the eastern United States. Arkansas Game and Fish Commission. 46 pp.



Zapus hudsonius — Meadow jumping mouse



Family Zapodidae

Synonyms None

Legal Status Alabama state protected.

Reasons for Current Status The meadow jumping mouse appears to be very scarce in Alabama. A 1977 study on its distribution and ecology in the state met with limited success.

Description A medium-sized mouse, 76-85 mm head-body length. White belly, yellowish-brown above with a darker dorsal band. Hind limbs much larger and longer than forelimbs and tail up to 1.5 times longer than the head and body.

Distribution Within the ACT/ACF study area, meadow jumping mice are probably confined to the Piedmont and Ridge and Valley physiographic provinces. It is not known from the Coastal Plain.

Habitat Terrestrial/forest-woodlands. Prefers wet, grassy places, especially those grading into weedy and shrubby habitats, but is found in drier areas.

Other Biological Data Primarily nocturnal. Feeds on seeds, insects, and fruits.

Concerns No specific threats have been identified.

References

Burt, W.H., and R.P. Grossenheider. 1976. A field guide to the mammals. Peterson Field Guide No. 5, 3rd ed. Houghton Mifflin Co., Boston. 289 pp.

Dusi, J.L. 1986. Meadow jumping mouse, *Zapus hudsonius* (Zimmermann). Pages 116 *in* Mount, R.H., ed. Vertebrate animals of Alabama in need of special attention. Ala. Agr. Expt. Sta., Auburn Univ. 124 pp.

Whittaker, J.O., Jr. 1972. *Zapus hudsonius*. Mammalian Species 11:1-7.

PROTECTED SPECIES INVENTORY AND IDENTIFICATION

in the Alabama-Coosa-Tallapoosa and Apalachicola-Chattahoochee-Flint River Basins

APPENDIX C

SPECIES ABSTRACTS FOR INVERTEBRATES

Information compiled by:

Alabama Natural Heritage Program
The Nature Conservancy and the
Alabama Department of Conservation and Natural Resources

Florida Natural Areas Inventory
The Nature Conservancy and the
Florida Department of Natural Resources

U.S. Geological Survey
Biological Resources Division
Florida-Caribbean Science Center
Department of the Interior

U.S. Fish and Wildlife Service
Panama City, Florida, Field Office
Department of the Interior

January 1997

Lampsilis altilis Conrad 1834 — Fine-lined pocketbook

Family Unionidae

Synonyms *Unio altilis, U. clarkianus, U. gerhardtii, U. doliaris, Margaron altilis, M. clarkianus, M. gerhardtii, M. doliaris, Lampsilis, clarkiana, L. clarkianus, L. doliaris, L. gerhardtii, Margarita altilis*

Legal Status Federal threatened (58 FR 14330-14340, 1993); Georgia threatened.

Critical Habitat Not designated.

Reasons for Current Status Fragmentation of range due to impoundments that result in isolation of populations within and among drainages. Isolation also may cause a decrease in genetic diversity and reduce reproductive and recruitment potential. All extant populations of this species are susceptible to extirpation by a single catastrophic event, such as a chemical spill or major channel modification (U. S. Fish and Wildlife Service 1993).

Description The fine-lined pocketbook is a medium-sized mussel, suboval in shape and rarely becomes larger than 100 mm in length (U. S. Fish and Wildlife Service 1993). The shell is rather thin, suboval, ovate or elliptical, but moderately inflated. The epidermis is straw colored or yellowish-brown to blackish, but smooth and rather shining. It is faintly rayed to rayless (Simpson 1914).

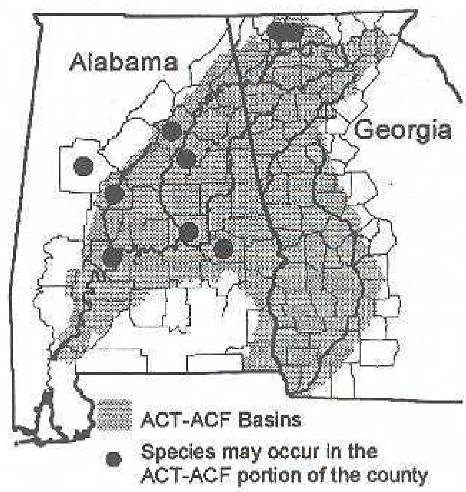
Distribution Described from the Alabama River near Claiborne, Monroe County, Alabama, the fine-lined pocketbook has been historically recorded from the Alabama River drainage (Alabama River, Tatum Creek, Chewacla Creek, Opintlocco Creek), Cahaba River drainage (Little Cahaba, Buck Creek), the Black Warrior River drainage (Black Warrior River, Sipsey Fork, Brushy Creek), the Tombigbee River drainage (Sipsey River, Buttahatchee River), and the Etowah and Conasauga rivers in Georgia. (U. S. Fish and Wildlife Service 1993).

Recent data collections have found this species in the Coosa River and Talladega Creek systems in Alabama (Pierson 1992; McGregor 1993). According to the U. S. Fish and Wildlife Service (1993), the fine-lined pocketbook appears to be restricted to the headwaters of the Sipsey Fork (Black Warrior River drainage), Tatum Creek (Alabama River drainage), Little Cahaba River (Cahaba River drainage), Conasauga River and Shoal Creek (Coosa River drainage), and Opintlocco and Chewacla creeks (Tallapoosa River drainage).

Habitat Riverine. The fine-lined pocketbook has been found in stable gravel and sandy-gravel substrates in high-quality, free-flowing rivers and large creeks.

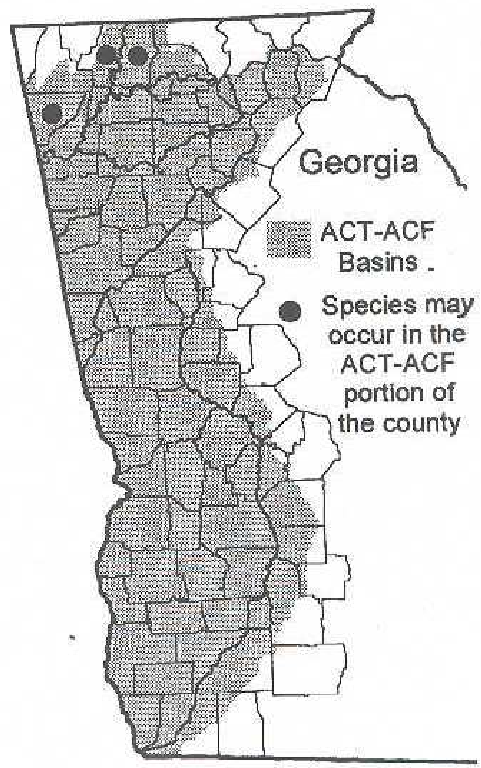
Other Biological Data See introduction.

Concerns See introduction.



Medionidus acutissimus Lea 1831

Alabama moccasinshell



Family Unionidae

Synonyms *Unio acutissimus, U. rubellinus, U. rubellinanus, U. semiplicatus, Margaron acutissimus, M. rubellinus, Margarita acutissimus*

Legal Status Federal threatened (58 FR 14330-14340, 1993); Georgia threatened.

Critical Habitat Not designated.

Reasons for Current Status The range of this species has been fragmented by reservoir construction on large rivers resulting in the isolation of populations. Pollution and siltation also has resulted in the loss of populations in tributaries.

Description The shell of this species is small, subinflated and rhomboidal. The surface is shiny yellowish or greenish and marked with faint rays composed of zigzag or broken lines. The nacre is salmon colored (Simpson 1914).

Distribution Historically, the Alabama moccasinshell was known from the Alabama River (AL), Tombigbee River drainage (AL, MS) (Luxapalila Creek, Buttahatchee River, Sipsey River), Black Warrior River drainage (AL) (Black Warrior River, Mulberry Fork, Brushy Creek), the Cahaba River drainage (AL), and the Coosa River drainage (AL, GA) (Talledega Creek, Choccolocco Creek, Chattooga River)(U. S. Fish and Wildlife Service 1993).

Habitat Riverine. The Alabama moccasinshell is known from rivers and large creeks (Johnson 1977), where it occurs in substrates of boulders, cobble, gravel, and sand.

Other Biological Data Field surveys are needed to locate existing populations.

Concerns See introduction.

Medionidus parvulus Lea 1860

Coosa moccasinshell

Family Unionidae

Synonyms *Unio parvulus, Margaron parvulus*

Legal Status Federal endangered (58 FR 14330-14340, 1993); Georgia endangered.

Critical Habitat Not designated.

Reasons for Current Status The range of this species has been fragmented by reservoirs, resulting in the isolation of populations within and among drainages (U. S. Fish and Wildlife Service 1993). Isolation may cause decreased genetic diversity and reduced reproductive and recruitment potential. All extant populations of this species are susceptible to extirpation by a single catastrophic event, such as a chemical spill or major channel modification.

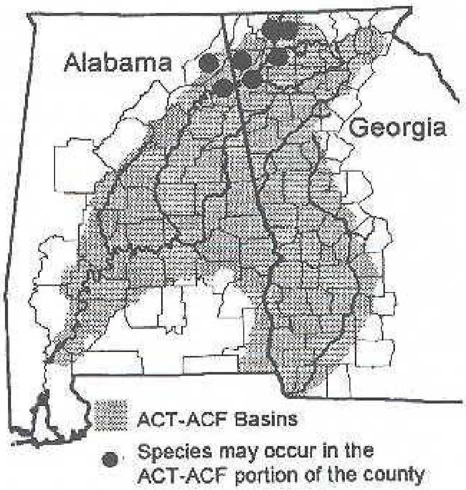
Description The Coosa moccasinshell is a species with small elongated shells that are subcompressed, subsolid, and somewhat rhomboidal. The surface is greenish or yellowish, and marked with delicate green undulating or zigzag lines that are sometimes very faint. The nacre is bluish green (Simpson 1914). Occasionally the shell, which is thin and fragile, exceeds 40 mm in length (U. S. Fish and Wildlife Service 1993).

Distribution The Coosa moccasinshell was described from the Coosa River in Alabama. This species has been collected from the Cahaba River, the Sipsey Fork of the Black Warrior River, and tributaries of the Coosa River in Alabama and Georgia (U. S. Fish and Wildlife Service 1993).

Habitat Riverine. The Coosa moccasinshell has been found in stable gravel and sandy-gravel substrates in high-quality, free-flowing streams and rivers (U. S. Fish and Wildlife Service 1993).

Other Biological Data Field surveys are needed to locate existing populations.

Concerns See introduction.



Amphigyra alabamensis **Pilsbry 1906** **Shoal sprite**

Family Planorbidae **Synonyms** None **Legal Status** Federal species of concern

Reasons for Current Status This species has not been collected during recent surveys and may be extinct.

Description The shell of this snail is limpet-like with a small coil at the apex and about 2-3 mm in size. Examination by an expert on planorbid snails is necessary for positive identification.

Distribution The historical range was in the Coosa River, Alabama (county-level data not obtained for species' distribution in the study area).

Habitat Riverine/mainstream/pool/riffle: Bedrock-bottomed pools adjacent to riffles.

Other Biological Data This snail may be extinct.

Concerns Sedimentation, and water quality degradation. New impoundments would reduce availability of riverine habitat.

Antrorbis breweri **Herschler and Thompson 1990**

Snail **Family** Hydrobiidae

Synonyms None

Legal Status Federal species of concern

Reasons for Current Status This snail has an extremely limited distribution and is susceptible to extinction.

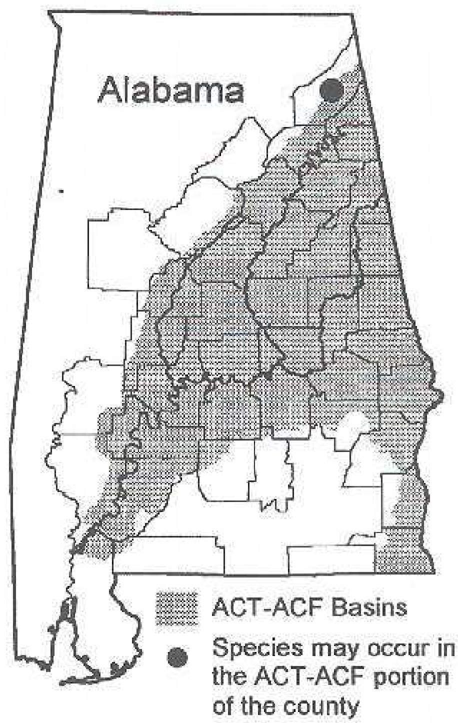
Description This is a small snail with a maximum size of 3 mm. Examination by an expert on hydrobiid snails is necessary for correct identification.

Distribution Alabama, Coosa River Basin; this hydrobiid is known only from Manitou Cave in Dekalb County near Ft. Payne.

Habitat Riverine/tributary/run: *A. breweri* is a cave inhabitant found in small cascades and among rubble in the stream in Manitou Cave.

Other Biological Data Bat guano is a food item.

Concerns Any disturbance to the cave ecosystem would threaten this species, such as reduced hydrological input, degradation of water quality, or resumption of commercial activities. The cave was at one time operated commercially, but this was discontinued in 1980.



Genus: *ELIMIA*

Family Pleuroceridae

Legal Status Ten members of this genus that meet the legal status criteria for inclusion in this report occur in the study area. Because information about this group is sparse, abbreviated abstracts follow this description, which is applicable to the group as a whole.

Reasons for Current Status General declines in the populations and range reductions of the species listed below, in some cases leading to presumed extinction, are the bases for their status.

Description Specific descriptions are generally not given for the following aquatic snails. Identification of these species requires examination by a trained malacologist.

Distribution All ten species addressed here are endemic to either the ACT or ACF, except *E. olivula*, which also occurs in the Tombigbee drainage of the Mobile Basin.

Habitat The general habitats of the snails of the genus *Elimia* are shoals, riffles, and runs in rivers and tributaries over substrates of bedrock, boulders, cobble, gravel, sand, and/or woddy debris.

Other Biological Data Natural history and ecological data on the pleurocerid snails is sparse. Individual snails are either male or female. Most species are thought to be herbivorous.

Concerns Additional impoundments of free-flowing waters, sedimentation, siltation, and degradation of water quality.

Elimia alabamensis Lea 1860

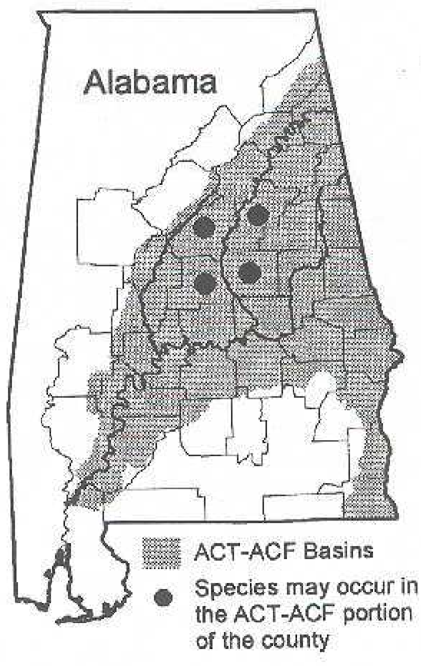
Mud elimia **Family** Pleuroceridae

Synonyms *Melania aequa, M. crepera, M. fallax, M. fumea, M. propinqua, M. pudica, M. quadrivittata, M. rara, M. shelbyensis, M. solidula, Goniobasis osculata*

Legal Status Federal species of concern

Distribution This species is a middle Coosa River system endemic in Alabama. Historically, it was known from the main stem of the river and tributaries in Shelby and Talladega counties. Recent surveys have only located the species in Chilton and Coosa counties.

Habitat Riverine/mainstream/tributaries.



Elimia albanyensis Lea 1864

Black crest elimia **Family** Pleuroceridae

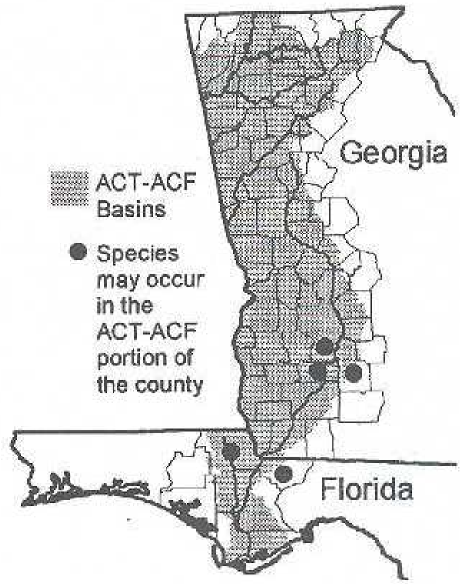
Synonyms *Elimia boykiniana albanyensis*

Legal Status Federal species of concern

Description An aquatic snail with dark-colored spiral chords in the shell having either a smooth or wavy texture. The vertical sculpture of the shell is reduced to irregularly spaced and uneven growth striations or low undulating ribs.

Distribution Found in tributaries of the Flint River, south to directly below Jim Woodruff Dam on the Apalachicola River.

Habitat Riverine/mainstream/tributary. Shoal species, confined to shoals immediately below Jim Woodruff Dam. Also found on shoals in tributaries of the Flint River near Albany, Georgia.



Elimia bellula Lea 1861

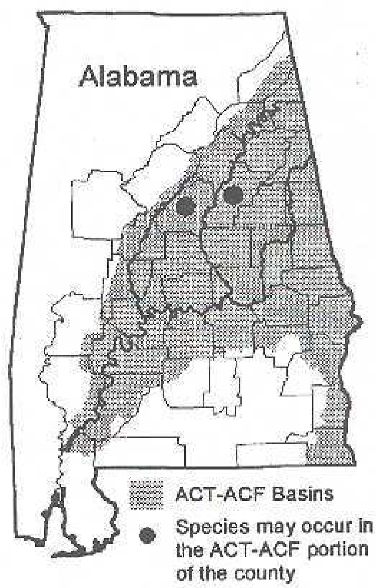
Walnut elimia **Family** Pleuroceridae

Synonyms *Melania bellula, M. crepera, M. fumea; M. propria, M. punicea, M. shelbyensis, M. sulidula, Lithasia vittata, Goniobasis lepidea, L. cylindrica*

Legal Status Federal species of concern

Distribution This species was historically found in the mainstem of the middle Coosa River, from Gadsden, Etowah County to Wetumpka, Elmore County, and in Yellowleaf and Choccolocco creeks. In recent collections, it only has been taken from Yellowleaf and Choccolocco creeks, Shelby and Talladega counties, Alabama.

Habitat Riverine/maintstream/tributaries.



Elimia crenatella Lea 1860

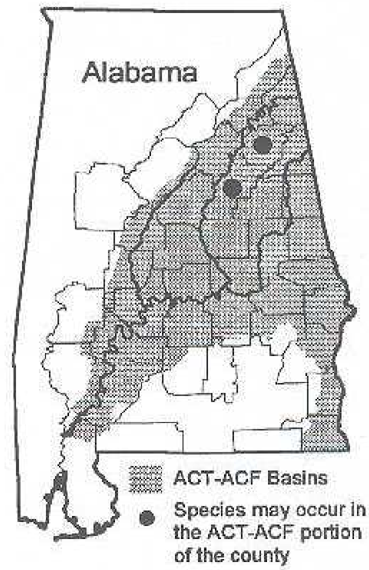
Lacey elimia **Family** Pleuroceridae

Synonyms *Melania crenatella*

Legal Status Federal candidate

Distribution Historically, this speices was known from the Coosa River, St. Clair to Chilton counties, and from tributaries in St. Clair, Etowah, and Talladega counties. Recent collections have been taken in Cheaha Creek, Emauhee, and Weewoka creeks, all in Talladega County.

Habitat Riverine/mainstream/tributary.



Elimia fascians Lea 1861

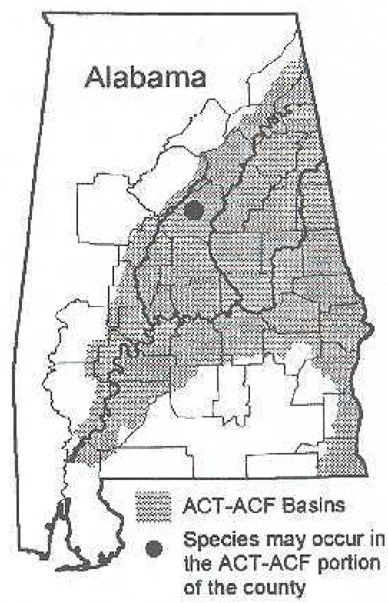
Banded elimia **Family** Pleuroceridae

Synonyms *Goniobasis infuscata*, *G. tenebrovittata*, *G. baculoides*

Legal Status Federal species of concern

Distribution The banded elimia is a species mainly of the tributaries of the Coosa River, but sometimes present in the mainstream. It ranged from Calhoun to Coosa counties. During recent surveys it was collected only at lower Yellowleaf Creek, in Shelby County.

Habitat Riverine/tributary (occasionally mainstream).



Elimia haysiana Lea 1842

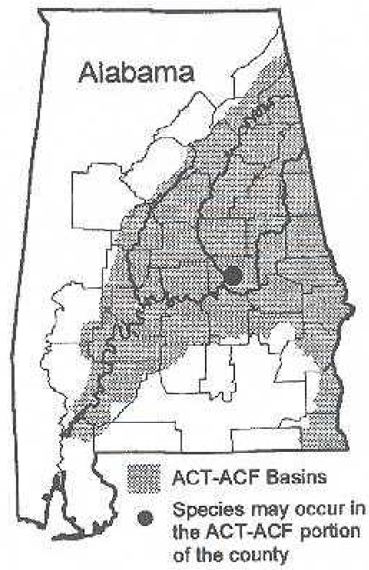
Silt elimia **Family** Pleuroceridae

Synonyms *Melania haysiana, M. oliva, M. ovalis, M. arctata, M. harpa, M. coosaensis, M. glandaria, M. gracilior, M. lewisii, M. nubila, M. orbicula, Goniobasis ellipsoides, M. cylindrica*

Legal Status Federal species of concern

Distribution The historic range was the Coosa River from Wetumpka, Elmore County, to Chilton County. The species is now known only between Wetumpka and Jordan Dam, in Elmore County, Alabama.

Habitat Riverine/mainstream.



Elimia olivula Conrad 1834

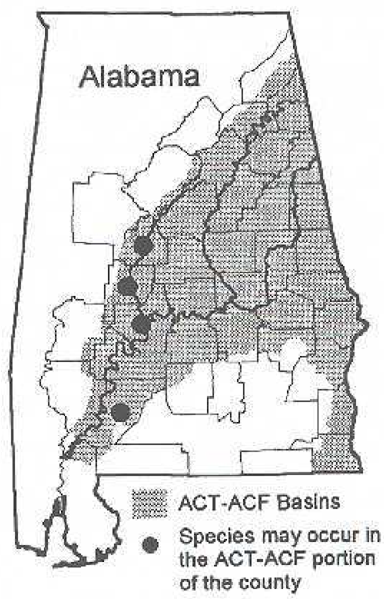
Caper elimia **Family** Pleuroceridae

Synonyms *Melania olivula, M. bitaeniata, M. inflata, M. basalis, M. proteus, M. oppugnata, M. midas, M. straminea, Goniobasis gibberosa, G. sulcata, G. olivula, Oxytrema olivula*

Legal Status Federal species of concern

Distribution The caper elimia has been reported from the Alabama River in Dallas and Monroe counties, the lower Tombigbee River, and the Cahaba River from 12.8 km north of Sprott (Perry County) to 16 km west of Selma (Dallas County). In recent collections, this species has been documented from the Cahaba River at nine sites, all below the Fall Line, from the Bibb/Perry county line to the mouth of the river.

Habitat Riverine/margin. Caper elimias have been observed on damp, soapstone, chalky cliff faces up to 3 m above the water surface at regions of vertical seepage.



Leptoxis ampla Anthony 1855

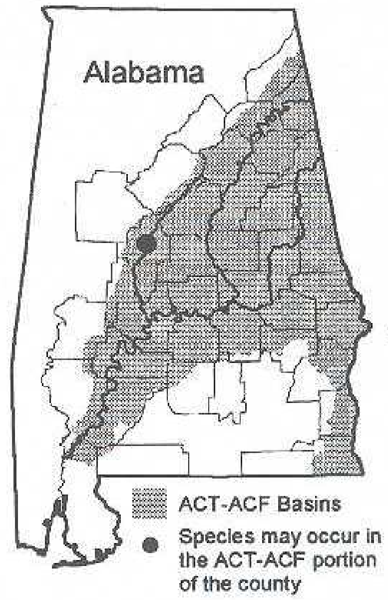
Round rocksnail **Family** Pleuroceridae

Synonyms *Leptoxis ampla* form *ampla*, *Anculosa ampla*, *A. elegans*, *L. ampla* form *mimica*, *A. mimica*

Legal Status Federal candidate

Distribution The Coosa River at Wetumpka, Cahaba River, and Little Cahaba River east of Piper, Bibb County is the historic range. Recent collections identified this species from 19 localities in the Cahaba River in Bibb and Shelby couties.

Habitat Riverine/mainstream. This species utilizes smooth, clean rocks in the current.



Leptoxis compacta Anthony 1854

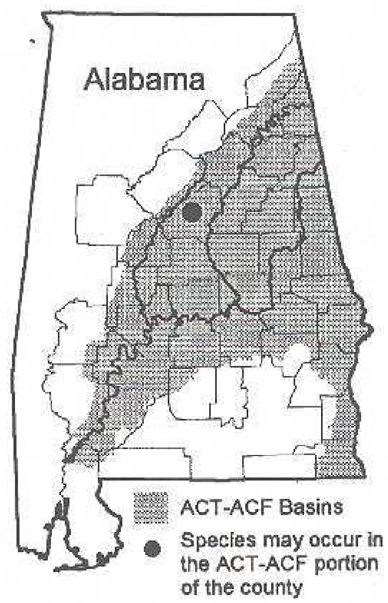
Oblong rocksnail **Family** Pleuroceridae

Synonyms *Melania compacta*, *M. fuscocincta*, *M. germana*, *Oxytrema germana*, *Lithasia nuclea*, *Anculosa compacta*

Legal Status Federal species of concern

Distribution The oblong rocksnail occured in the Cahaba River and Buck Creek in Shelby County. This species was not documented during recent surveys.

Habitat Riverine/mainstream.



Leptoxis picta Conrad 1834

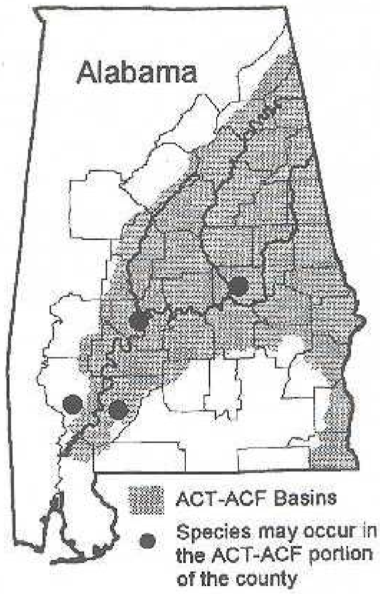
Spotted rocksnail **Family** Pleuroceridae

Synonyms *Anculosa picta, A. zebra*

Legal Status Federal species of concern

Distribution Historically this species was known from the Cahaba River 19 km west of Selma, Dallas County, the Alabama River at Claiborne, Monroe County, and the Coosa River as far upstream as Wetumpka, Elmore County. No specimens were collected during recent surveys in the Cahaba and Coosa river systems. This species is currently present in the Alabama River below Cliaborne.

Habitat Riverine/mainstream.



Leptoxis taeniata Conrad 1834

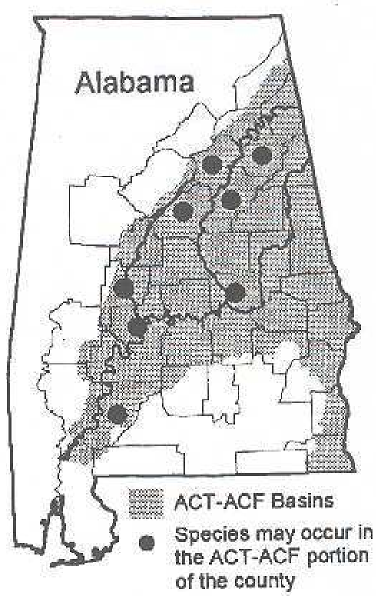
Painted rocksnail **Family** Pleuroceridae

Synonyms *Anculosa griffithiana, A. rubiginosa, A. coosaensis, A. aldrichi, A. brevispira, A. choccoloccoensis, A. flexuosa, A. taeniata lucida, Anculotus taeniata*

Legal Status Federal candidate

Distribution This species has been documented from Claiborne, Monroe County, and Selma, Dallas County in the Alabama River, in the Coosa River in all the large shoals between Wetumpka, Elmore County, and St. Clair County, and was reported from the Cahaba River in the lower portions below the Fall Line. The species may be extirpated from the Alabama River. No specimens were collected in the Cahaba River during recent surveys; in the Cahaba River basin, it was collected at only two localities, Choccolocco Creek and Buxahatchee Creek, Shelby and Talladega counties.

Habitat Riverine/mainstream/tributary. Painted rocksnails have been reported as occurring in slow waters on small rocks with light siltation.



Lioplax cyclostomaformis Lea 1841

Cylindrical lioplax **Family** Viviparidae

Synonyms *Paludina cyclostomaformis, P. contorta, P. ellitottii*

Legal Status Federal candidate

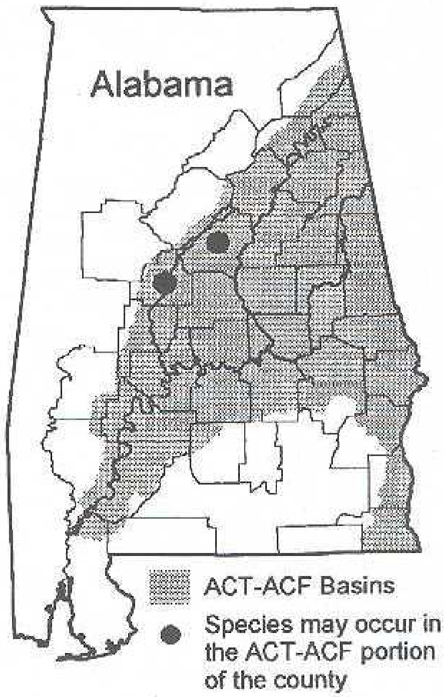
Reasons for Current Status Due to riverine modifications, this species has been greatly reduced in numbers in the Alabama and Coosa rivers.

Description The identification of this species requires malacological training.

Distribution This species occurs in Alabama, Georgia, and Louisiana. In Alabama it occupies the Coosa, Cahaba, and Alabama river basins, and was recently collected from the main channel of the Cahaba River at 3 sites in Bibb and Shelby counties.

Habitat Riverine/maintstream: The habitat of this snail is in mud in the middle of fast chutes and riffles, under boulders.

Concerns Impoundments, altered water flow, sedimentation, and degradation of water quality threaten this species.



Genus: *Neoplanorbis* **Family** Planorbidae

Legal Status Four members of this genus that meet the legal status criteria for inclusion in this report occur in the study area. Because information about this group is sparse, abbreviated abstracts follow this description, which is applicable to the group as a whole.

Reasons for Current Status All known habitat for these species has been inundated by Lay Dam, Jordan Dam, and Mitchell Dam. These species are presumed extinct. No specimens of the following species were collected during recent surveys in the Coosa River basin.

Description The identification of these snails can only be made by a trained malacologist.

Distribution The genus *Neoplanorbis* is endemic to the Coosa River in the ACT system.

Concerns Impoundments, water quality degradation, and sedimentation.

Neoplanorbis carinatus Walker 1908

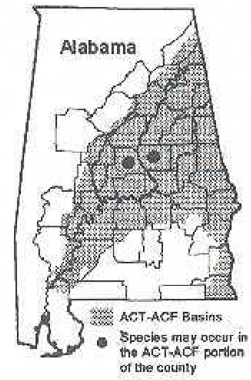
Snail **Family** Planorbidae

Synonyms None

Legal Status Federal species of concern

Distribution The lower Coosa River, bordering Chilton and Coosa counties, Alabama, was the historic distribution.

Habitat Riverine/mainstream. The underside of rocks in fairly rapid currents was the known habitat.



Neoplanorbis smithi Walker 1908

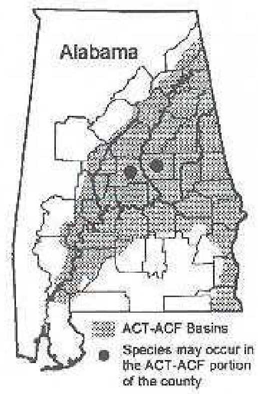
Snail **Family** Planorbidae

Synonyms None

Legal Status Federal species of concern

Distribution The Coosa River, Duncan's Riffle and Higgin's Ferry, Chilton County, and Butting Ram Shoals, Coosa County, Alabama, made up the historic distribution

Habitat Riverine/mainstream. Moderate current was a known habitat requirement.



Neoplanorbis tantillus Pilsbry 1906

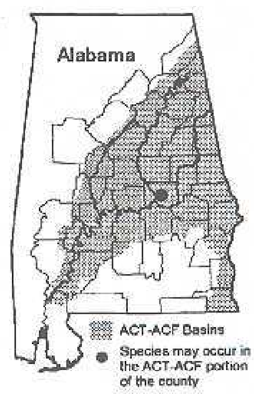
Snail **Family** Planorbidae

Synonyms None

Legal Status Federal species of concern

Distribution Coosa River, Wetupka, Elmore County, Alabama, was the historic distribution

Habitat Riverine/mainstream. The underside of rocks in swift current was the known habitat



Neoplanorbis umbilicatus Walker 1908

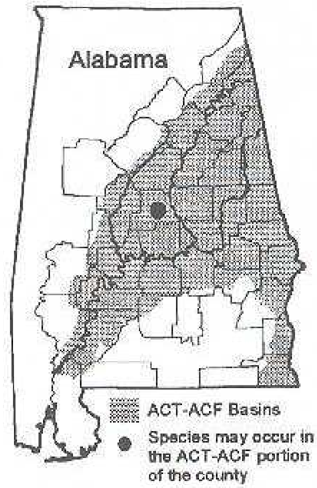
Snail **Family** Planorbidae

Synonyms None

Legal Status Federal species of concern

Distribution Coosa River, at The Bar and Cedar Island, Chilton County, Alabama, was the historic distribution

Habitat Riverine/mainstream. Strong current was a known habitat requirement



Genus: ***Pleurocera*** **Family** Pleuroceridae

Legal Status Two members of this genus that meet the legal status criteria for inclusion in this report occur in the study area. Because information about this group is sparse, abbreviated abstracts follow this description, which is applicable to the group as a whole.

Reasons for Current Status Reduction in the range of the species, and loss of habitat due to impoundment of rivers has precipitated the listing of these species.

Description Examination by a someone with malacological expertise is needed for accurate identification of these species.

Concerns Further impoundments of the river systems, sedimentation, and water quality degradation threaten these species.

Pleurocera foremani Lea 1843 **Rough hornsnail** **Family** Pleuroceridae

Synonyms *Melania foremanii, Oxytrema foremanii* **Legal Status** Federal species of concern

Distribution This species has been reported from the Cahaba River at Pratt's Ferry, Bibb County, Alabama, and in the Coosa River system from the Etowah River in Georgia downstream. It also has been collected from Coosa River tributaries. During recent surveys of the Coosa and Cahaba rivers it was not collected and may be extinct (no map).

Habitat Riverine/manistream/tributary.

Pleurocera showalteri **Lea 1862**

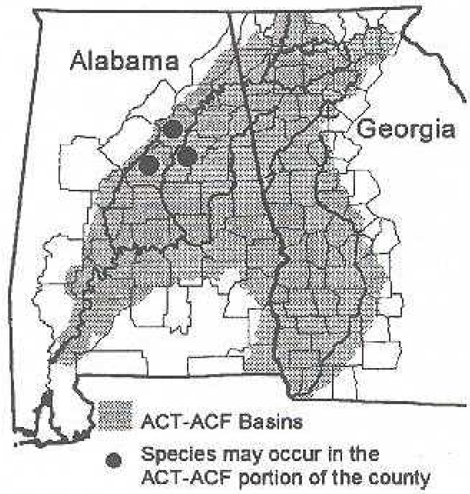
Upland hornsnail **Family** Pleuroceridae

Synonyms *Trypanostoma showalterii, T. moriforme, Oxytrema showalteri*

Legal Status Federal species of concern

Distribution This species has been reported from Alabama and Georgia in the lower regions of the headwaters of the Coosa River. During recent surveys, this snail was collected in 3 tributaries of the Coosa River, in Shelby, St. Clair, and Talladega counties, Alabama.

Habitat Riverine/mainstream/tributary.



Pyrgulopsis castor Thompson 1972

Beaver pond marstonia

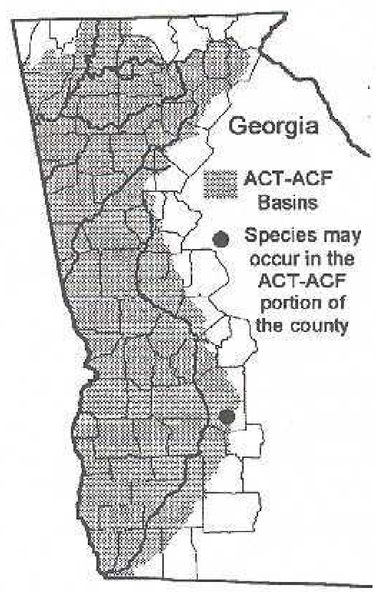
Family Hydrobiidae

Synonyms *Marstonia castor*

Legal Status Federal species of concern

Distribution Known only from the type locality, Cedar Creek, Flint River system, Crisp County, Georgia.

Habitat Riverine



Rhodacme elatior **Anthony 1855**

Domed ancylid **Family** Ancylidae

Synonyms *Rhodacmea cahawbensis*

Legal Status Federal species of concern

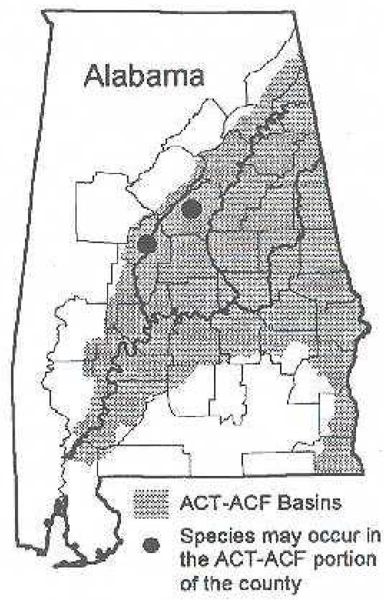
Reasons for Current Status Due to the alteration of riverine systems, there has been a loss of habitat leading to reductions in the range and numbers of this snail.

Description The identification of this species requires training in malacology.

Distribution This species has been collected in the Tennessee and Cahaba river systems. This snail was recorded from 3 localities in the Cahaba River system during recent surveys: Cahaba and Little Cahaba rivers, Bibb County, and Cahaba River, Shelby County.

Habitat Riverine/mainstream/tributary

Concerns Sedimentation, impoundments, and degradation of water quality threaten this species.



Rhodacme filosa **Conrad 1834** **Wicker ancylid**

Family Ancylidae **Synonyms** None **Legal Status** Federal species of concern

Reasons for Current Status This snail has undergone a loss of habitat and reduction of range because of alterations in the river systems inhabited. Concern has been expressed that this species may be extinct.

Description The identification of this species requires training in malacology.

Distribution This snail has been reported from the Black Warrior and Coosa rivers in Alabama, and in the Tennessee River system. During recent surveys in the Coosa River basin, ancylid snails were collected but no specific identification was made (county-level data not obtained for species' distribution in the study area).

Habitat Riverine/mainstream/tributary

Concerns Further impoundments, sedimentation, and overall degradation of water quality threaten this species.

Genus: *Somatogyrus*

Family Hydrobiidae

Legal Status Eleven members of this genus that meet the legal status criteria for inclusion in this report occur in the study area. Because information about this group is sparse, abbreviated abstracts follow this description, which is applicable to the group as a whole.

Reasons for Current Status These snails have declined in numbers and available habitat has been reduced by alteration of river systems. Snails of the genus *Somatogyrus* were collected in both the Cahaba and Coosa river systems during recent surveys. The specific identification of these specimens has not been determined, therefore no comments can be made concerning the existence of presumed extinct species.

Description The identification of these species can only be done by a hydrobiid specialist.

Concerns Further river impoundments, sedimentation, and degradation of water quality threaten these species.

Somatogyrus aureus Tryon 1865

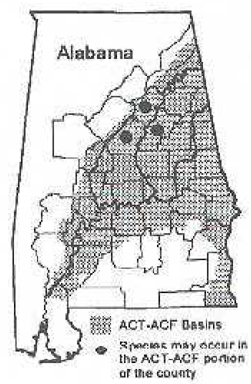
Golden pebblesnail **Family** Hydrobiidae

Synonyms None

Legal Status Federal species of concern

Distribution This snail has been reported from the Coosa River, St. Clair and Talladega counties, Kelly's Creek, St. Clair County and Yellowleaf Creek, Shelby County, Alabama.

Habitat Riverine/mainstream/tributary.



Somatogyrus constrictus Walker 1904

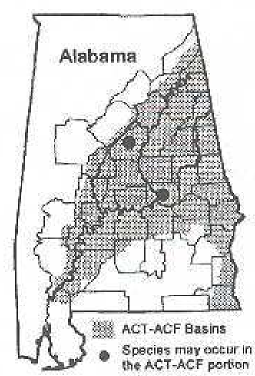
Knotty pebblesnail **Family** Hydrobiidae

Synonyms None

Legal Status Federal species of concern

Distribution This snail has been collected from the Coosa River, 8 km above Wetumpka, Elmore County, Wilsonville, Shelby County, Alabama. This species may now be extinct.

Habitat Riverine/mainstream. This species has been collected from the underside of rocks in associations with *Somatogyrus coosaensis* and *S. hinkleyi*.



Somatogyrus coosaensis Walker 1904

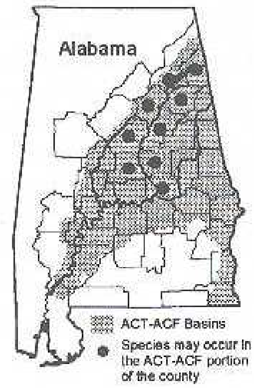
Coosa pebblesnail **Family** Hydrobiidae

Synonyms None

Legal Status Federal species of concern

Distribution This snail has been collected from the Coosa River, from 3.2 km above Slackland, Cherokee County to Wetumpka, Elmore County, and in creeks of St. Clair, Shelby, and Talladega counties, Alabama.

Habitat Riverine/mainstream/tributary.



Somatogyrus crassus Walker 1904

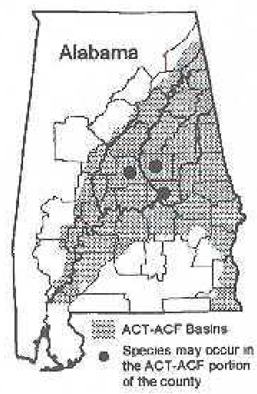
Stocky pebblesnail **Family** Hydrobiidae

Synonyms None

Legal Status Federal species of concern

Distribution This snail has been collected from the Coosa River, in the main stem in Elmore, Chilton, and Coosa counties. This species may be extinct, as it appeared to be restricted to the mainstem of the Coosa River.

Habitat Riverine/mainstream.



Somatogyrus decipiens Walker 1909

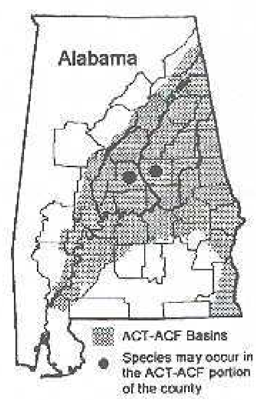
Hidden pebblesnail **Family** Hydrobiidae

Synonyms None

Legal Status Federal species of concern

Distribution This snail has been collected from the Coosa River at The Bar, Cedar Island, Butting Ram Shoals, Higgins Ferry, Duncan Riffle, and Fort Williams Shoals, Chilton and Coosa counties, Alabama. This species may be extinct.

Habitat Riverine/mainstream.



Somatogyrus hendersoni Walker 1909

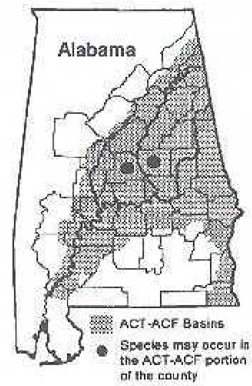
Fluted pebblesnail **Family** Hydrobiidae

Synonyms None

Legal Status Federal species of concern

Distribution This snail has been collected from the Coosa River, Coosa and Chilton counties, Alabama. This species may be extinct.

Habitat Riverine/mainstream.



Somatogyrus hinkleyi Walker 1904

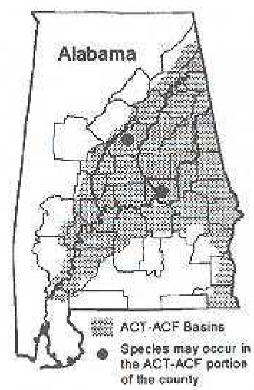
Granite pebblesnail **Family** Hydrobiidae

Synonyms None

Legal Status Federal species of concern

Distribution This snail has been collected from the Coosa and Tallapoosa rivers, and some tributaries. In the Coosa River at Wetumpka, Elmore County, Wilsonville, Shelby County, and Fort William Shoals, Alabama.

Habitat Riverine/mainstream/tributary.



Somatogyrus nanus Walker 1904

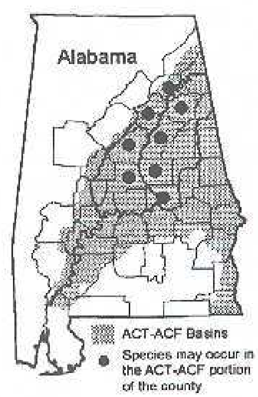
Dwarf pebblesnail **Family** Hydrobiidae

Synonyms None

Legal Status Federal species of concern

Distribution This snail has been collected from the Coosa River, from Ten-Acre Island, Etowah County to Wetumpka, Elmore County, and in Weogufka Creek, Coosa County, Alabama

Habitat Riverine/mainstream/tributary.



Somatogyrus obtusus Walker 1904

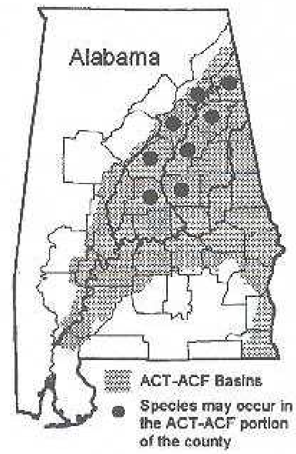
Moon pebblesnail **Family** Hydrobiidae

Synonyms None

Legal Status Federal species of concern

Distribution This snail has been collected from the Coosa River, Center Landing, Cherokee County, to the Coosa-Chilton counties shoals, and in Upper Clear Creek, and tributaries, Talladega County, Alabama.

Habitat Riverine/mainstream/tributary.



Somatogyrus pygmaeus Walker 1909

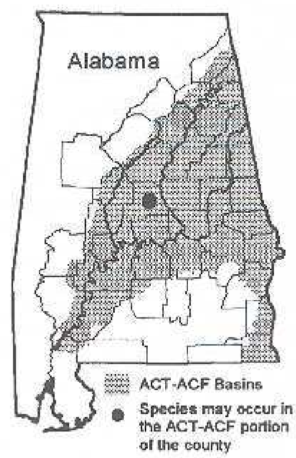
Pygmy pebblesnail **Family** Hydrobiidae

Synonyms None

Legal Status Federal species of concern

Distribution This snail has been collected from the Coosa River at the The Bar, Chilton County. This species may be extinct.

Habitat Riverine/mainstream.



Somatogyrus quadratus Walker 1906 **Quadrate pebblesnail**

Family Hydrobiidae **Synonyms** None **Legal Status** Federal species of concern

Distribution This snail has been collected from the Coosa River (county-level data not obtained for species' distribution in study area).

Habitat Riverine/mainstream.

Stiobia nana Thompson 1978

Sculpin snail **Family** Hydrobiidae

Synonyms None

Legal Status Federal species of concern

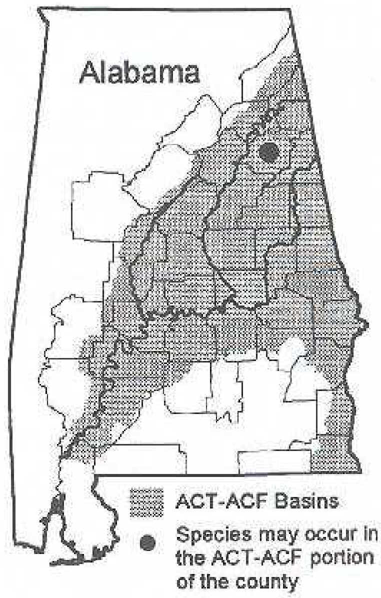
Reasons for Current Status The sculpin snail has an extremely limited distribution.

Description The accurate identification of this species requires examnination by an expert on hydrobiid snails.

Distribution The sculpin snail is found only in Coldwater Spring run, near Oxford, Calhoun County, Alabama of the Coosa River basin.

Habitat Riverine/tributary/run:

Concerns Water quality degradation of Coldwater Spring or alteration of the spring would threaten this species..



Tulotoma magnifica Conrad 1834

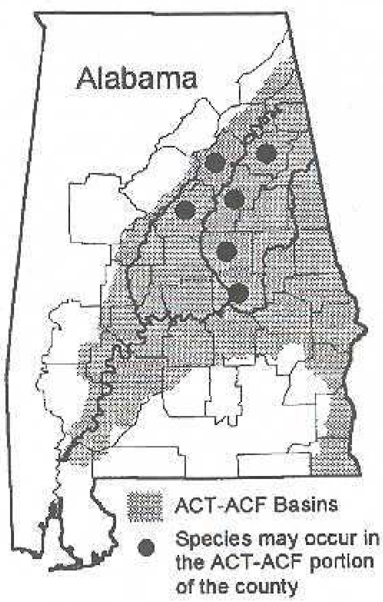
Tulotoma **Family** Viviparidae

Synonyms *Paludina magnifica*, *P. bimonilifera*, P. angulata, *P. coosaensis*

Legal Status Federal endangered, Federal Register, 56(6), January 9, 1991. State Protected (Alabama Regulations: Game, Fish, and Furbearing Animals; Nongame Species Regulation, 220-2-.98).

Critical Habitat Not designated

Reasons for Current Status Historically tulotoma was known from approximately 560 river km in the Alabama and Coosa rivers. This species was considered extinct by Turgeon et al. (1988), but was rediscovered by Hershler et al. (1990). Currently, its range has been reduced to only about 5 river km in the Coosa River, and segments of four tributaries (Hershler et al. 1990). The remaining populations are isolated with little or no possiblity of genetic exchange.



Tulotoma magnifica Conrad 1834

Tulotoma (continued)

Description The tulotoma is an operculate, gilled species with a globular shell which may be slightly larger than 25 mm high. Ornamentation of spiral lines and knobs are present on the shell. No other aquatic snail in the Coosa River system possesses these shell ornamentations.

Distribution Historically, the tulotoma was present in the Coosa River from St. Clair County to the Alabama River. In the Alabama River it could be found downstream to Clarke and Monroe counties. The lower regions of several large tributaries of the Coosa River also supported tulotoma populations (Hershler et al. 1990).

Currently the tulotoma is only known from six populations of unimpounded water in the Coosa River system. The single Coosa River population is near Wetumpka, Elmore County. Four tributaries support populations of the snail: Kelly Creek in St. Clair and Shelby counties, Weogufka and Hatchet creeks in Coosa County, Choccolocco Creek in Talladega County, and Ohatchee Creek in Calhoun County (Hershler et al. 1990).

Habitat Riverine/mainstream/tributary/riffle: Tulotoma requires cool, clean, well-oxygenated, free-flowing water, and is found in riffle and shoal areas. It is often found on the underside of boulders in swift currents. The snail may utilize depths as deep as 5 m (Christman et al. 1995).

Other Biological Data Tulotoma is a filter-feeder and broods its young. Females may reach sexual maturity in about 22 weeks. Females grow more rapidly than males. Snail densities in suitable habitat may range from $11/m^2$ to $75/m^2$. The birth of young reaches a peak in April and May (Christman et al. 1995).

Concerns Impoundments, siltation, industrial and municipal waste, poor water quality and low dissolved oxygen levels, and excessively low hydropower discharges are threats to tulotoma.

Cicindela marginipennis — Cobblestone tiger beetle

Family Cicindelidae

Synonyms None

Legal Status Federal species of concern.

Reasons for Current Status Populations of *C. marginipennis* continue to disappear due to damming and dredging of its very limited habitat. Historical locations in Pennsylvania and West Virginia have been flooded by dams, and recent surveys in Mississippi indicate the species has been extirpated from the Tombigbee River by the Tenn-Tom Waterway. Proposed hydroelectric dam projects, if implemented, would likely eradicate this species from New Hampshire, Vermont, Pennsylvania, New Jersey, and New York.

Description A tiger beetle, 11-14 mm in length. Dull olivaceous green above, coppery below. Elytral markings consist of a continuous white marginal band, with small lobes on the inside edge. The underside of the abdomen is brownish red, which, when combined with the white margin, make this species distinctive.

Distribution Within the study area, *C. marginipennis* occurs on several small islands in the Coosa River near Wetumpka, Alabama. The species historically occurred in the Tombigbee River in Mississippi, but was apparently extripated by the U.S. Army Corps of Engineers Tennessee-Tombigbee Waterway project in the 1980's. Other extant populations are currently known from the upper Connecticut and Delaware rivers, the White Water River of Indiana, and the Scioto River and Paint Creek of Ohio.

Habitat Terrestrial; Riverine. Cobblestone tiger beetles have extremely specialized habitat requirements. Adults and larvae are found among cobblestones and small patches of sand on the upstream portions of islands in large swift moving rivers, especially in areas kept open by periodic flooding. Highest beetle densities occur in the upper middle sections of the islands, where sediment is neither scoured completely away nor completely buries the cobblestones. Habitat is neither overgrown nor devoid of vegetation, with the best habitat having 10-30% herbaceous or low woody vegetative cover. Thirty or more adults seen in 30 minutes of slow walking in prime habitat on a warm, sunny day in July indicates an excellent occurrence.

Other Biological Data Both larvae and adults are predaceous. Larvae ambush prey from burrows 1 to 4 mm in diameter, dug in sandy spots between cobbles. Adults are most active on warm, sunny days. Prey are small insects, especially ants and small flies. Adults are active only during the summer months, and have been observed in Alabama as early as late June.

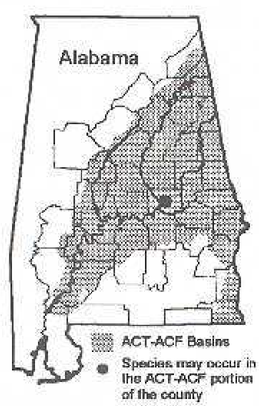
Concerns Loss of habitat through dam construction and subsequent inundation, and reduced water flow. Off-road vehicles, where they have access to cobble areas during low water periods, may destroy larvae or larval habitat. Long-term reduction of flow volumes could adversely affect island habitats by reducing the natural cycle of periodic scouring floods and island formation, and by increasing access for off-road vehicles.

References

Nothnagle, P. 1989. Element stewardship abstract for *Cicindela marginipennis*. The Nature Conservancy, Arlington, Virginia. 4 pp.

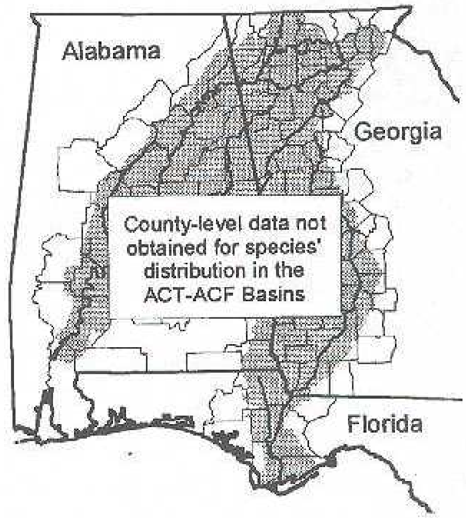
Scoffer, T.L. 1990. Status survey of *Cicindela marginipennis* Demean (Coleoptera: Cicindelidae) in the Tombigbee River drainage in Mississippi. Unpub. report. Mississippi State Univ., Mississippi Entomological Museum. 17 pp.

Schweitzer, D.F. 1989. A review of category 2 Insecta in U.S. Fish and Wildlife Service Regions 3,4, and 5. The Nature Conservancy, unpub. report to the U.S. Fish and Wildlife Service. 143 pp.



Dryobius sexnotatus

Sixbanded longhorn beetle



Family Cerambycidae

Synonyms None

Legal Status Federal species of concern.

Reasons for Current Status Although found over a fairly large area, this species seems to be declining substantially. This is a large, diurnal, and very gaudy beetle that would not likely be overlooked, yet the frequency of collection for this species has declined. Larvae bore in trunks of large standing, overmature, dying trees, and the cutting of old growth forests has probably greatly reduced its habitat.

Description A colorful longhorn beetle.

Distribution Distribution in the study area is unknown. In the Southeast, reported from Alabama, Mississippi, Louisiana, and Tennessee. Also found in Maryland, Ohio, Pennsylvania, Arkansas, Indiana, Kansas, Kentucky, Michigan, Missouri, Virginia, West Virginia.

Habitat Terrestrial. Old growth stands containing beech and/or maple in river or stream valleys or on islands in rivers.

Other Biological Data Sugar maple (*Acer saccharum*) appears to be the preferred food plant in Pennsylvania, but other species, especially beech (*Fagus grandifolia*), have been reported. Sugar maple does not occur within the tri-state study area, but other maples occurring in riparian habitats, such as silver maple (*Acer saccharinum*) and box elder (*Acer negundo*), should be considered as potential food plants in Alabama.

Concerns Logging of remaining mature or nearly mature stands of riverine hardwood bottomland forests, and changes in flow regimes that reduce acreage or otherwise alter its bottomland forest habitat.

References

Schweitzer, D.F. 1989. A review of category 2 Insecta in U.S. Fish and Wildlife Service Regions 3,4, and 5. The Nature Conservancy, unpub. report to the U.S. Fish and Wildlife Service. 143 pp.

PROTECTED SPECIES INVENTORY AND IDENTIFICATION

in the Alabama-Coosa-Tallapoosa and Apalachicola-Chattahoochee-Flint River Basins

APPENDIX D

SPECIES ABSTRACTS FOR PLANTS

Information compiled by:

Alabama Natural Heritage Program
The Nature Conservancy and the
Alabama Department of Conservation and Natural Resources

Florida Natural Areas Inventory
The Nature Conservancy and the
Florida Department of Natural Resources

Georgia Natural Heritage Program
Wildlife Resources Division
Georgia Department of Natural Resources

U.S. Fish and Wildlife Service
Panama City, Florida, Field Office
Department of the Interior

January 1997

Apios priceana — Price's potatoe-bean

Family Fabaceae

Synonyms *Glycine priceana* (Robinson) Britton

Legal Status Federal threatened (55 FR 429-433, January 5, 1990).

Critical Habitat Not designated

Reasons for Current Status Small number of known populations, low level of sexual reproduction, and habitat loss. Clearcutting or heavy logging can eliminate populations of this species (U. S. Fish and Wildlife Service 1989).

Description *Apios priceana* is a perennial herbaceous vine. Vines climb to 5 meters from a large thickened tuber. Leaves are alternate (20-30 cm in length) and pinnately compound with 5-9 leaflets. The leaflets are 4-10 cm in length, 2-5 cm in width, ovate or rounded at the base and on 3-5 mm hairy petioles. The upper leaflet surface is smooth, and the lower surface is pale and slightly hairy. Racemes are 5-9 cm in length, and occur in clusters of 2 and 3 in the axils of pale green, ovate, hairy, acuminate bracts, on pedicels 3-5 mm long. The corolla is typical of pea or bean, and is pale greenish-pink with deeper tints of maroon, and approximately 1 cm in length. The standard petal is bi-auriculate at the base, with a fleshy beak-like tip. The lateral or wing petals are shorter than the standard and oblong in shape, and the keel or bottom ridged petals are fleshy and upwardly curved. The pods are 12-15 cm in length, 1 cm wide, tapered at both ends, and contain approximately 10 seeds per pod.

Apios priceana can be distinguished from the similar *Apios americana* by the following characteristics: a large single tuber, relatively large, pink, fleshy flowers, and longer pods. Seedlings of *A. priceana* have unifoliate, opposite eophylls; with the third or fourth becoming bi- or trifoliate. *A. americana* has unifoliate alternate eophylls; none of the first five being trifoliate (Duke 1983).

Distribution *A. priceana* occurs in the Coastal Plain, Interior Low Plateaus and Appalachian Plateau physiographic provinces of the eastern United States. Since its discovery, 36 populations have been found in 22 counties of five states: Alabama, Illinois, Kentucky, Mississippi, and Tennessee (U. S. Fish and Wildlife Service 1993). Twenty-five populations are extant and occur in 15 counties of four states: Alabama, Kentucky, Mississippi, and Tennessee (U. S. Fish and Wildlife Service 1993). Populations in Alabama occur in Autauga, Madison, and Marshall counties.

Habitat Terrestrial/forest-woodlands. Rocky wooded slopes and floodplain edges under mixed hardwoods or in clearings within. This species occurs on well-drained loams either on old alluvium or over calcareous boulders (Kral 1983).

Other Biological Data The rarity of this plant is an indication that this species has a narrow ecological amplitude (Kral 1983). Research regarding the reproductive biology and genetic diversity of *A. priceana* also are relevant to the continued existence of this rare species. It may require active management for recovery (C. Norquist, pers. commun., 1994). Populations are most vigorous in areas with minimal shading and selective logging may be beneficial to this species (Medley 1980). Price's potato bean flowers in June to August.

Concerns Many populations occur in floodplains and alluvial soil types; therefore, changes in the water management of such an area could result in decreased habitat availability or the elimination of this species. Habitat loss from clearcutting or conversion for agricultural purposes is a major threat. Inundation of the habitat would extirpate populations. Eleven populations are located on rights-of-way and the maintenance of these areas by herbicide use, mowing, and clearing of trees could damage or extirpate these populations (U. S. Fish and Wildlife Service 1990). Damage by pests such as spider mites, powdery mildew virus, root-knot nematodes, and invasion by exotic species such as *Coronilla varia* have been cited as potential threats to this species (U. S. Fish and Wildlife Service 1993).

References

Duke, J.A. 1983. Seedling variation in *Apios*. Phytologia 54:409-410.

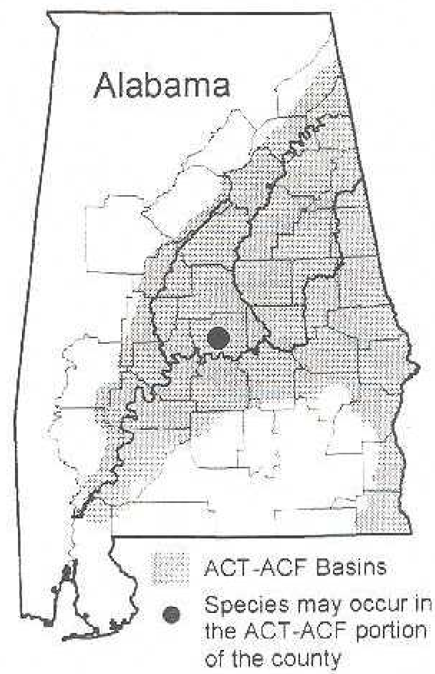
Kral, R. 1983. A report on some rare, threatened or endangered forest-related vascular plants of the

Apios priceana Price's potatoe-bean

south. Tech. Pub. R8-TP 2. USDA Forest Service Atlanta. Georgia. 1:617-620.

Medley, M.E. 1980. Status report on *Apios priceana*. Unpub. report to the U.S. Fish and Wildlife Service, Atlanta, Georgia. 32 pp.

U. S. Fish and Wildlife Service. 1993. Recovery plan for Price's potato-bean (*Apios priceana*). Jackson. Mississippi. 45 pp.



Arabis georgiana Harper

Georgia rock-cress

Family Brassicaceae

Synonyms None

Legal Status Federal species of concern; Georgia threatened.

Reasons for Current Status *Arabis georgiana* is rare throughout its range. A slightly larger number of populations are found in Alabama.

Description Perennial herb. This is an erect plant up to 90 cm tall. The basal leaves are oblanceolate, rounded at the apex, toothed on the margins, 4-8 cm long, and with or without long, tapered leafstalks (petioles). The basal leaves usually persist through the fruiting season and have green lower surfaces. The stem leaves are alternate, lanceolate to narrowly elliptic, 1-5 cm long, somewhat clasping the stems, and smooth to sparingly hairy with stiff, branched hairs on the upper surface. All leaves tend to be finely hairy with both branched and unbranched hairs on the lower surface. Flowers are borne in a terminal inflorescence that is sometimes loosely branched. The four petals are white, 6-9 mm long, and tardily spreading. The fruit stands erect as a slender (less than 1 mm wide), relatively long (5-7 cm) pod that splits in two, leaving behind a thin, papery, lengthwise partition. Seeds (usually 20-30) are borne in single rows on each side of the partition; they are flat, oblong, 1.5-2.0 mm long, chestnut brown, and narrowly winged. Flowering period: March to April; fruiting period: May to early July. Best search time: during fruiting, since fruit length and orientation are helpful for identification.

SPECIAL IDENTIFICATION FEATURES: In Georgia, *Arabis* is represented by at least six species, but only two of them occur with *A. georgiana*. Smooth rock-cress (*A. laevigata*) has smooth, narrow, clasping stem leaves; smaller (3-5 mm long), white to creamy petals; and curved (sickle-shaped), wider (to 2.5 mm wide), mature fruits. Canada rock-cress (*A. canadensis*) has variable stem leaves from smooth to hairy, but non-clasping; also smaller (3-5 mm long), white to creamy petals; and curved (sickle-shaped), wider (2.5-4.0 mm broad), mature fruits. In contrast, Georgia rock-cress has clasping lower stem leaves; showier, pure white petals (6-9 mm long); and erect, straight, slender (only 1 mm broad) fruits.

Distribution Southcentral Alabama to western Georgia. Recorded from six counties in Georgia. In Alabama, it has been reported from Bibb, Colbert, Elmore and Wilcox counties.

Habitat Terrestrial/forest-woodlands. *Arabis georgiana* occurs in partial to full shade along bluffs and riverbanks (rocky or alluvial) in hardwood forest. The substrate is often derived from a calcareous source such as limestone, dolomite or chalk.

Other Biological Data Samuel Boykin (1786-1848) made the first collection of this species in 1841, from along the Chattahoochee River, "20 miles from Columbus."

Concerns Disturbance associated with heavy logging or grazing of the bluffs and banks on which plants occur is likely to have a negative effect on this species due to resultant erosion. Any management activity or land use that would lead to the direct or indirect destruction or degradation of the habitat or population (e.g., flooding, clearcutting, construction, etc.) should be regarded as a potential threat to the species. Exotic weeds, especially Japanese honeysuckle, pose a threat.

References

Al-Shehbaz, I.A. 1988. The genera of Arabideae (Cruciferae; Brassicaceae) in the southeastern United States. J. Arnold Arboretum 69(2):86-166.

Harper, R.M. 1903. A new *Arabis* from Georgia. Torreya 3:87-88.

Harper, R.M. 1904. A new station for *Arabis georgiana*. Torreya 4:24-25.

Harper, R.M. 1906. Notes on the distribution of some Alabama plants. Bull. Torrey Botanical Club 33:523-536.

Harper, R.M. 1940. Supplementary notes on *Acorus* and *Arabis*. Torreya 40:196-197.

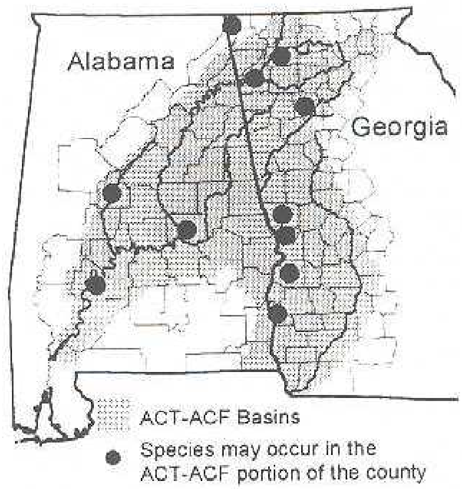
Hopkins, M. 1937. *Arabis* in eastern and central North America. Rhodora 39:63-98, 106-148, 155-186, plates 457-458.

Rickett, H.W. 1966. Wild flowers of the United States, Vol. 2: the southeastern states. McGraw-Hill, New York. 688 pp.

Arabis georgiana Harper

Georgia rock-cress

Small, J.K. 1933. Manual of the southeastern flora 1972 reprint ed. Hafner Publ. Co., New York. 1554 pp.



Hymenocallis coronaria Kunth

Shoals spiderlily

Family Liliaceae

Synonyms None

Legal Status Federal species of concern; Georgia endangered.

Reasons for Current Status *Hymenocallis coronaria* has sustained significant habitat loss: some populations have been submerged by impoundments and others have declined due to degraded water quality, especially due to the deposition of silt. It is rare throughout its range.

Description Perennial, emergent, aquatic herb. Plants may become 1 m tall and arise from a large bulb. The leaves are basal, spongy near the base, strap-shaped, 3-4 cm wide, and up to 80 cm long. The 6-9 (rarely fewer) flowers are borne in a terminal cluster on long stalks (1-3 per plant) that equal or exceed the basal leaves. The flowers are about 15 cm across, opening in late afternoon and withering the next day, emitting a delightful fragrance at twilight. Usually only one flower opens per day, but this feature may vary according to brightness and vigor. These flowers are quite showy, white with a yellowish center, with a narrow, greenish perianth tube bearing six white, petal-like parts, each 10-12 cm long, and a central cup or crown (corona) 6-7 cm high, to which the staminal filaments are attached. The fruit is a fleshy capsule that prematurely splits open, exposing the dark green, oblong seeds, each 2-4 cm long, 1 cm wide, and resembling green olives. Flowering period: mid-May to early June; fruiting period: July to August. Best search time: during flowering, since the white blooms are showy.

SPECIAL IDENTIFICATION FEATURES: The shoals spiderlily grows in mainstream channels, its blooms peak in late May, and its leaves and stems are more robust than other spiderlilies. The taxonomy of the spiderlilies (*Hymenocallis* spp.) is difficult and controversial. The narrowly defined habitat of the shoals spiderlily is a reliable field observation. All other native spiderlilies inhabit swamps and floodplains, their peaks of bloom vary (some are summer bloomers), and their stature is shorter (usually less than 0.8 m tall).

Distribution *Hymenocallis coronaria* occurs in Alabama, Georgia, and South Carolina in rocky shoals in the piedmont or along the boundary between the Coastal Plain and Piedmont physiographic regions. In Alabama, it has been recorded from Bibb, Coosa, Lee, Shelby, Tallapoosa, and Tuscaloosa counties in the Black Warrior, Cahaba, Coosa, and Tallapoosa river systems. The species has been extirpated from the Black Warrior River in Tuscaloosa County. Recorded from eight counties in Georgia.

Habitat Riverine/mainstream. Found in major streams and rivers in rocky shoals and in cracks of exposed bedrock; usually with riverweed (*Podostemon ceratophyllum*) and water-willow (*Justicia virginiana*). Plants can be completely submerged during flooding, the bulbs wedged among the rocky strata.

Other Biological Data The famed naturalist-explorer William Bartram made the first recorded observation of this species in 1773, when he noted it growing in the Savannah River at the "cataracts of Augusta." This species was formally described in 1836. It has since been found in about 18 streams, including five in Georgia. Opinions vary as to what botanical family includes the spiderlilies. Although placed in the lily family (Liliaceae) by Arthur Cronquist, both Armen Takhtajan and Robert Thorne place *Hymenocallis* in the amaryllis family (Amaryllidaceae). The ongoing Flora of North America Project follows Cronquist, as do the authors of *Protected Plants of Georgia*. For a review of the accepted system of family classification see Flora of North America Editorial Committee (1993).

Concerns Impoundments could inundate and diversions could reduce the shoals habitat of this species. Any management activity or land use (e.g., siltation and loss of water quality due to strip-mining, construction, agriculture, clear-cutting, and dumping of sewage) that would lead to the direct or indirect destruction or degradation of the habitat should be regarded as a potential threat to the species.

References

Davenport, L.J. 1989. Reproductive biology of the Cahaba lily (*Hymenocallis coronaria*). Supplement to American J. Botany 26(1):97-98.

Hymenocallis coronaria Kunth — Shoals spiderlily

Davenport, L.J. 1990. The Cahaba Lily. Alabama Heritage 16:24-31. Univ. of Alabama Press, Tuscaloosa.

Flora of North America Editorial Committee. 1993. Flora of North America, Vol: 1. Introduction. Oxford Univ. Press, New York. 372 pp.

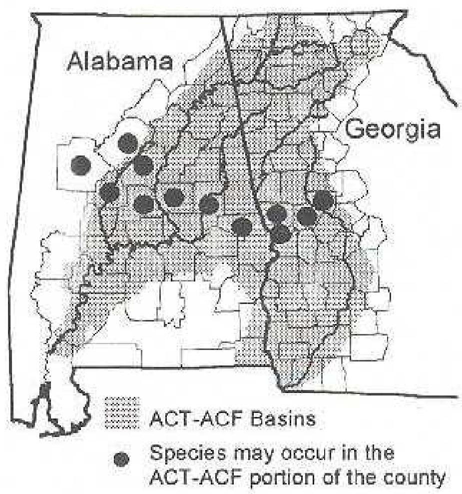
Kral, R. 1983. A report on some rare, threatened, or endangered forest-related vascular plants of the south. Tech. Pub. R8-TP 2 1:237-240. USDA Forest Service, Southern Region, Atlanta, Georgia.

McDaniel, S. 1981. Status report on *Hymenocallis coronaria*. Unpub. report to the U.S. Fish and Wildlife Service, Atlanta, Georgia.

Mohr, C. 1901. Plant life of Alabama. Contributions from the U.S. National Herbarium VI.

Rickett, H.W. 1966. Wild flowers of the United States, Vol. 2: The southeastern states. McGraw-Hill, New York. 688 pp.

Small, J.K. 1933. Manual of the southeastern flora, 1972 reprint ed. Hafner Publ. Co., New York. 1554 pp.



Quercus boyntonii Beadle — Running post oak

Family Fagaceae

Synonyms *Quercus stellata* var. *boyntonii* (Beadle) Sargent

Legal Status Federal species of concern.

Reasons for Current Status Regional endemic; few known populations.

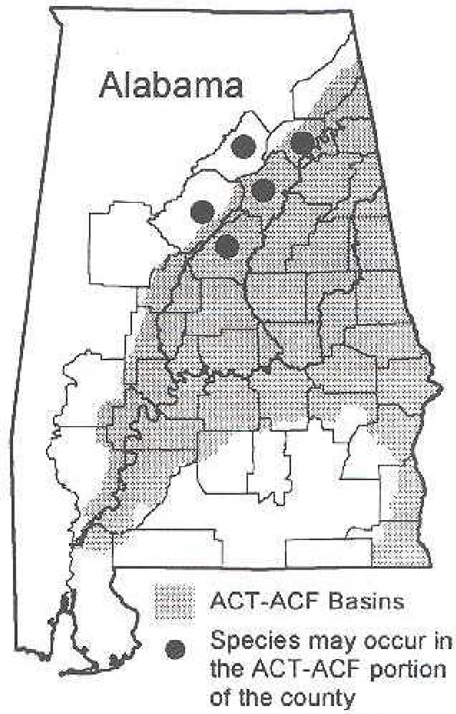
Description *Quercus boyntonii* is a shrub 1-5 m tall. Bark is grayish or brown, and broken into irregular appressed scales. Leaves are wedge-shaped, 5-9 cm long, with 3-7 small blunt lobes above the middle or near the apex; leaves have matted wooly pubescence on the lower surface. Acorns are sessile; the nut is oval and 12-15 cm long, the cap is turbinate and 9-12 mm wide.

Distribution *Q. boyntonii* occurs in the Ridge and Valley region of Alabama in Blount, Etowah, Jefferson, Shelby, and St. Clair counties. There are historical reports from Texas.

Habitat Terrestrial/forest-woodlands. Cherty, limestone barrens; forms thickets on ridges.

Other Biological Data Unknown

Concerns Clear-cutting, clearing for agriculture, and urban development. Inundation of rocky bluffs adjacent to a waterway would, of course, eliminate this terrestrial species.



References

Clark, R.C. 1971. The woody plants of Alabama. Ann. Missouri Bot. Gard. 58:99-242.
Dean, B.E. 1988. Trees and shrubs of the southeast, 3rd ed. Birmingham Audubon Society Press, Alabama. 264 pp.
Small, J.K. 1903. Manual of the southeastern flora. Univ. N.C. Press, Chapel Hill. 1554 pp.

Rudbeckia triloba var. *pinnatiloba* Torrey and Gray — Pinnate-lobed coneflower

Family Asteraceae

Synonyms *Rudbeckia pinnatiloba*

Legal Status Federal species of concern.

Reasons for Current Status *Rudbeckia triloba* var. *pinnatiloba* is known from only a few localized areas (although it may be locally abundant).

Description The pinnate-lobed coneflower is a taprooted short-lived perennial that reaches a height of 1.5 m and has a daisylike head. The stem is covered with long shaggy hairs that are rough to the touch. The blades of the upper leaves are ovate-lanceolate, small, up to 5 cm long. Some leaves pinnately lobed. The bracts of the involucre are linear to linear-lanceolate in shape. The flattened strap-like ray flowers are 10-20 mm in length. The disk or cone-like head is 1-1.5 cm across. This variety can be distinguished from others of this genus pinnately (5-7) lobed lower stem leaves (or at least some of them). The bracts of the involucre (or most of them) are not half as long as the flattened strap-like ray flowers. The flowering season is in the summer and fall (Cronquist 1980, Kral 1983, Small 1933).

Distribution Known from central Alabama, northwestern Florida (Coastal Plain) and western North Carolina (Blue Ridge). In Alabama, it has been reported from Autauga, Bibb, Dallas, Lowndes, Tallapoosa, and Wilcox counties. Populations in Alabama are known from the extreme southern end of the Ridge and Valley, the Piedmont, and the black belt and Chunnenuggee Hills of the Coastal Plain. The largest and healthiest populations appear to be in Bibb County. Clewell reported the pinnate-lobed coneflower from Jackson County, Florida.

Habitat Terrestrial. The pinnate-lobed coneflower is found in open woods or clearings (natural or artificial). It prefers calcareous soils and these are typically shallow, xeric, well-drained, and usually sunny (Small 1933, Kral 1983).

Other Biological Data The soil type preferred by the pinnate-lobed coneflower is usually poor for pine plantations and not suitable for mechanical site preparations (Kral 1983).

Concerns It is unlikely that the pinnate-lobed cone flower will be affected by changes in water management. The principal threat is continued destruction of natural areas. (A.K. Gholson, pers. commun., 1994).

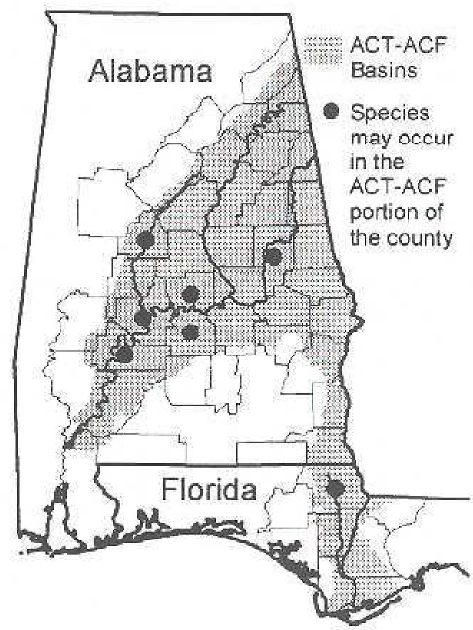
References

Clewell, A.F. 1985. Guide to the vascular plants of the Florida Panhandle. Univ. Press of Florida, Tallahassee, Florida.

Cronquist, A. 1980. Vascular flora of the southeastern United States, Vol. 1: Asteraceae. Univ. of North Carolina Press, Chapel Hill, North Carolina.

Kral, R. 1983. A report on some rare, threatened, or endangered forest-related vascular plants of the south. Tech. Pub. R8-TP 2 1:237-240. USDA Forest Service, Southern Region, Atlanta, Georgia.

Small, J.K. 1933. Manual of the southeastern flora. Univ. of North Carolina Press, Chapel Hill, North Carolina.



Sarracenia rubra ssp. *alabamensis* Schnell

Alabama canebrake pitcherplant

Family Sarraceniaceae

Synonyms *S. alabamensis* Case and Case, *S. alabamensis* Case and Case ssp. *alabamensis*, *S. jonesii* Wherry, *S. rubra* Walt.

Legal Status Federal endangered (54 FR 10154, March 10, 1989).

Critical Habitat Not designated.

Reasons for Current Status Destruction/adverse modification of available habitat, fire suppression, and over-collecting.

Description *Sarracenia rubra* ssp. *alabamensis* is a perennial, insectivorous herb arising from a rhizome. This species produces two types of pitchers, and occasionally some phyllodia. In the spring, pitchers are 0.8-5.0 dm long, erect, greenish, softly pubescent with a suberect, cordate hood; apex of pitcher and hood reddish-reticulate veiny. Late season pitchers largest, up to 6 dm long, somewhat winged ventrally, 3-7 cm broad at the orifice, hood ca. 3.5-6.6 cm wide, 7-10 cm long, slightly arching over the orifice, reddish-veiny, often whitish-areolate toward the apex. Flowers are solitary and nodding, with three recurved bracts; sepals ovate, to 2.2 cm broad, inwardly bent, reddish or greenish tinted with maroon; petals obovate, externally red, inner surfaces pale green. The style disk ca. 3.5-4 cm wide. The fruit is a globose capsule, 0.5-1.0 cm in diameter. Seeds 1.0-1.5 mm long.

Distribution *Sarracenia rubra* ssp. *alabamensis* occurs in the upper Coastal Plain in Autauga, Chilton, and Elmore counties, Alabama.

Habitat Palustrine. Sandhills seeps, sandy and gravelly bogs, and in swamps. Grows best in open areas where it is exposed to light.

Other Biological Data The Alabama canebrake pitcherplant originally occurred in sloping wet bogs and adjacent wet flatwoods in the Fall Line hills of central Alabama and the adjacent Piedmont. Historically, fire was an important factor in maintaining the openness of the habitat. Flowering occurs from late April to early June.

Concerns Any modification or disturbance to the habitat of this species (e.g., pond building, agricultural development, herbicide use, drainage of site, etc.) is a potential threat to this rare species. Suppression of fire in existing population localities is also a threat because the encroachment of woody species, or aggressive exotics will eventually eliminate the Alabama canebrake pitcherplant. Many populations are within pastures where cattle cause soil compaction and eutrophication of habitat.

References

Bell, C.R. 1949. A cytotaxonomic study of the Sarraceniaceae of North America. J. Elisha Mitchell Soc.

Case, F.W., and R.B. Case. 1974. *Sarracenia alabamensis*, a newly recognized species from central Alabama. Rhodora 76:650-665.

Case, F.W., and R.B. Case. 1976. The *Sarracenia rubra* complex. Rhodora 78:270-325.

Folkerts, G.W. 1976. Endangered and threatened carnivorous plants of North America. Pages 303-313 *in* Prance, G. and T. Elisa, eds. Extinction is forever. The New York Botanical Garden.

Harper, R.M. 1918. The American pitcher plants. J. Mitchell Soc. 34:110-125.

Kral, R. 1983. A report on some rare, threatened, or endangered forest-related vascular plants of the south. USDA. Forest Service, technical publication R8-TP2, Atlanta, Georgia. 1:549-552.

McDaniel, S.T. 1971. The genus *Sarracenia*. Bull. Tall Timbers Research Station, 9:36.

McDaniel, S.T. 1986. Taxonomic study of three *Sarracenia* subspecies (*S. rubra* ssp. *alabamensis*, *S. rubra* ssp. *wherryi*, and *S. rubra* ssp. *rubra*). Unpub. report to the U.S. Fish and Wildlife Service, Southeast Region, Atlanta, Georgia. 17 pp.

McDaniel, S.T., and R.L. Troup. 1982. Status report on *Sarracenia alabamensis* ssp. *alabamensis*. Unpub. report to the U.S. Fish and Wildlife Service, Southeast Region, Atlanta, Georgia. 17 pp.

Schnell, D.E. 1976. Carnivorous plants of the U.S. and Canada. Winston-Salem, N.C. John F. Blair.

Schnell, D.E. 1977. Infraspecific variation in *Sarracenia rubra* Walt.: some observations. Castanea 42:149-170.

Sarracenia rubra ssp. *alabamensis* Schnell

Alabama canebrake pitcherplant

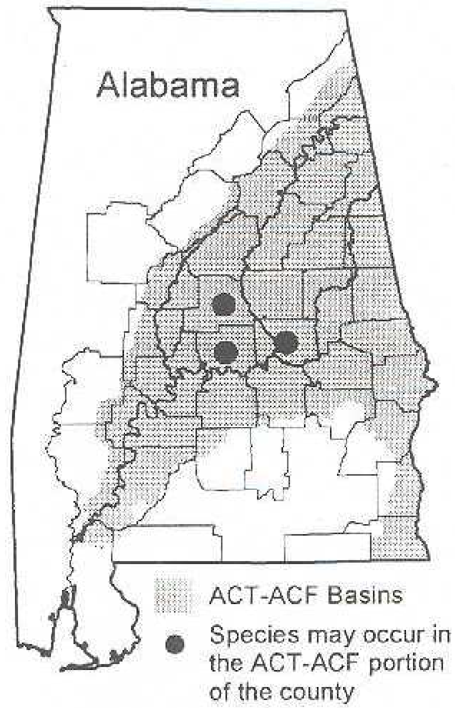
Schnell, D.E. 1978. Systematic flower studies of *Sarracenia* L. Castanea 43:211-220.

Schnell, D.E. 1979. *Sarracenia rubra* Walt. ssp. *gulfensis*: a new subspecies. Castanea 44(3):217-223.

Slack, A. 1980. Carnivorous plants. Massachussetts Inst. Tech. Press, Cambridge.

Slack, A. 1935. Distribution of the North American pitcher plant *in* Walcott, Illustrations of North American pitcher plants. Smithsonian Inst., Washington, D.C.

Wood, C.E. 1960. The genera of Sarraceniaceae and Droseraceae in the southeastern U.S. J. Arnold Arboretum, 41:152-156.



Sedum nevii Gray — Nevius stonecrop

Family Crassulaceae

Synonyms *Sedum beyrichianum* Masters

Legal Status Federal species of concern; Georgia threatened.

Reasons for Current Status *Sedum nevii* is rare throughout its range, which barely extends to Georgia.

Description Perennial herb. *S. nevii* is a low, creeping, succulent plant forming evergreen mats of bluish-green rosettes, each 1.0-2.5 cm in diameter, from which arise erect, flowering stems to about 20 cm tall. The rosette-leaves are spatulate to elliptic-lanceolate, 6.0-7.5 cm long, and 2-3 mm wide. The flowering-stem leaves are deciduous, linear, spirally alternate, nearly cylindrical, 7-15 mm long, and 1-3 mm wide. The flowering-stem leaves appear to be pasted to the stem; the leaf bases have short ears (auricles). The inflorescence is terminal, compound, and flat-topped, known as a cyme, 4-8 cm broad. The petals usually number 4, are white, 3.5-5.0 mm long, and 1.0-1.5 mm wide. The 8-10 stamens have red anther sacs. The fruit consists of four pod-like follicles, 3-4 mm long, spreading into a star-shape when mature. Flowering period: May to June; fruiting period: June to July. Best search time: all year, since evergreen basal rosettes are diagnostic, and stem leaves needed for proper identification.

SPECIAL IDENTIFICATION FEATURES: The evergreen clumps of basal rosettes formed by a vigorous network of ground-level stems are a conspicuous feature of *S. nevii*. The attachment, shape, arrangement, and size of the stem leaves are all diagnostic.

Distribution Southwestern edge of Piedmont Plateau of Georgia, disjunct in north central Alabama and in the Unaka Mountains of Polk County, Tennessee. In Alabama, the species has been recorded from Bibb, Coosa, Talladega, Chilton, Jefferson, and Tuscaloosa counties and Ridge and Valley physiographic provinces. Recorded from Harris and Muscogee counties in Georgia.

Habitat Terrestrial. Restricted in Georgia to shallow soil accumulations on granitic rock of steep bluffs along the Chattahoochee River; found on limestone and shale in Alabama and quarzitic slate in Tennessee.

Other Biological Data Reverend Reuben Denton Nevius made the first collection of this species in 1857 on a bluff above the Black Warrior River near Tuscaloosa, Alabama. Most of the populations are found in Alabama, but it is also known from one area in Georgia and one in Tennessee. Its distribution is one of widely scattered populations found in pockets of relatively undisturbed habitat. It is probably a relict species that was much more abundant in the distant past. The Georgia populations are all found within one mile of each other, and could be considered a single population consisting of three subpopulations. At the Georgia sites, *S. nevii* is associated with state-protected Georgia rockcress (*Arabis georgiana*).

Concerns Heavy logging of the tree canopy is likely to have a negative effect on this species by either drying out the habitat, admitting too much light, stimulating the rapid growth of vigorous competitors such as Japanese honeysuckle, or by resultant erosion of the usually steep slopes. Any other management activity or land use (e.g., flooding, construction, quarrying) that would adversely affect its habitat should be regarded as a potential threat to the species.

References

Calie, P.J. 1981. Systematic studies in *Sedum* section *Ternata* (Crassulaceae). Brittonia 33:498-507.

Calie, P.A., T.S. Patrick and B.E. Wofford. 1980. Status report on *Sedum nevii*. Unpub. report to the U.S. Fish and Wildlife Service, Atlanta, Georgia.

Clausen, R.T. 1949. The distribution and variation of *Sedum nevii*. Cactus and Succulent J. 21(6):180-185.

Clausen, R.T. 1975. *Sedum* of North America North of the Mexican Plateau. Cornell Univ. Press, Ithaca, New York. 742 pp.

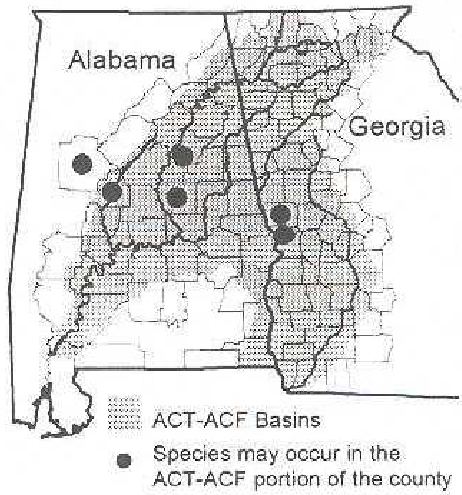
Duncan, W.H., and L.E. Foote. 1975. Wildflowers of the southeastern United States. Univ. of Georgia Press, Athens. 296 pp.

Kral, R. 1983. A report on some rare, threatened, or endangered forest-related vascular plants of the south. Tech. Pub. R8-TP 2 1:561-564. USDA Forest Service, Southern Region, Atlanta, Georgia.

Sedum nevii Gray

Nevius stonecrop

Mohr, C. 1901. Plant life of Alabama. Contributions from the U.S. National Herbarium VI.
Rickett, H.W. 1966. Wild flowers of the United States, Vol. 2: The southeastern states. McGraw-Hill, New York. 688 pp.
Small, J.K. 1933. Manual of the southeastern flora. Univ. of North Carolina Press, Chapel Hill, North Carolina.
Spongberg, S.A. 1978. The genera of Crassulaceae in the southeastern United States. J. Arnold Arboretum 59(3):197-247.
Wofford, B.E. 1989. Guide to the vascular plants of the Blue Ridge. Univ. of Georgia Press, Athens. 384 pp.



Solanum carolinense var. *hirsutum* Gray — Horse-nettle

Family Solanaceae

Synonyms *S. hirsutum* Nutt., *S. carolinense* L. var. *hirsuta* (Nutt.) D'Arcy

Legal Status Federal species of concern.

Reasons for Current Status Extreme rarity and habitat destruction. Until recently (1993), this plant had not been seen since the 1830s, and presumed extinct. Previously only known from two collections in Georgia.

Description Erect, weakly-branched, dwarf, rhizomatous perennial to 20 cm tall, usually much smaller. Stems with long, shaggy pubescence, more dense than var. carolinense, unarmed, or if a few prickles present these soft, not stout as in var. carolinense. Leaves simple, alternate, petiolate, the petioles 1-2 cm long, blades broadly obovate to ovate to elliptic-lanceolate, to 10 cm long and 5 cm wide, the bases rounded to cuneate, apices obtuse to obtuse-acute, usually lacking the spines present in var. carolinense, but if a few are present on leaf undersurfaces, these soft, not stout as in var. carolinense, both surfaces pubescent with stellate trichomes; margins more or less entire to only slightly sinuate, not coarsely sinuate to shallowly few-lobed as in var. carolinense. Inflorescence an unbranched few-flowered cymose-raceme, typically with not more than 3 flowers per inflorescence, the axis pubescent with long, shaggy hairs. Flowers perfect, the calyx tube 2-3 mm long, the lobes linear-lanceolate to lance-acuminate, 2.5-4 mm long, the surface pubescent with stellate and long shaggy hairs. Corolla white to light purple, 5 parted, 2-3 cm wide, the lobes ovate to triangular, reflexed, 6-9 mm long, anthers yellow, 6-9 mm long, connivent, ovary superior. Fruit a globose berry 1-2 cm in diameter. No published line drawings or photographs known.

Distribution This taxon has been found in Alabama and Georgia. In Alabama, it is known from Bibb, Chilton, and Coosa counties. Two historic extirpated populations are known from Georgia: Milledgeville, Baldwin County, and Columbus, Muscogee County. It was last collected in Georgia in 1837.

Habitat Terrestrial. The Alabama populations are in ecotone areas surrounding dolomite glades or sometimes on the glades. The historic Georgia locations were from xeric open habitats with little competition. (J. Allison, Georgia Natural Heritage Program, pers. commun., 1994).

Other Biological Data Listed as extinct in the Federal Register 58(188), September, 1993. This species had not been observed in the field since 1837; however, Jim Allison recently (April 1993) discovered 24 populations in Bibb County, Alabama. This species was originally named as a distinct species by Nuttall in 1834 and then treated as a variety of *S. carolinense* by Gray in 1878. It is unknown why D'Arcy (1974) made the new combination *S. carolinense* L. var. *hirsuta* (Nutt.) D'Arcy, since Gray had already combined the two taxa. Allison (Georgia Natural Heritage Program, pers. commun.,1994) feels this taxon may best be recognized as a distinct species. If so, the correct name appears to be *S. pumilum* Dunal, since Nuttall's *S. hirsutum* is a later synonym proceeded by Dunal's 1813 *S. hirsutum*. More survey work in Georgia in habitats similar to those where this taxon was recently discovered in Alabama seems justified.

Concerns Insufficient data exists to assess how changes in water management would affect this species. Inundation of possible habitat would likely extirpate populations. Based on the xeric, open nature of the historic Georgia locations, any change in water management that would significantly increase soil moisture would likely have a negative impact.

References

Chapman, A. 1883. Flora of the southern United States. Ivison, Blakeman, Taylor and Co., New York.

D'Arcy, W. 1974. Solanum and its close relatives in Florida. Ann. Missouri Bot. Gard. 61:819-867.

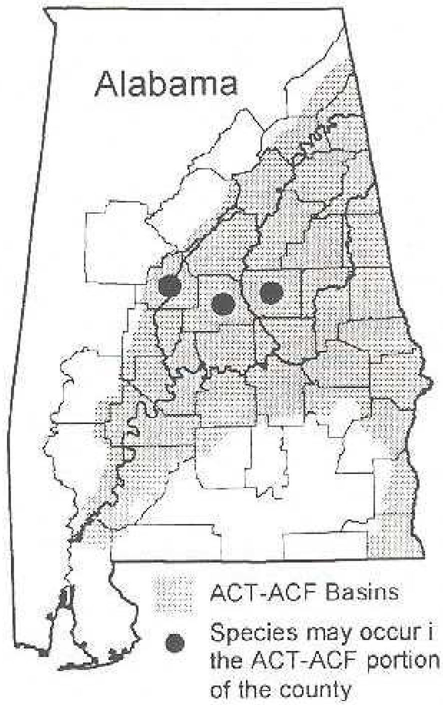
Dunal, M. 1852. Solanaceae. In DC Prodromus, 13(1):1-674.

Gray, A. 1878. Synoptical Flora of North America, edition 1. 2(1):230. Ivison, Blakeman, Taylor and Co., New York.

Gray, A. 1886. Synoptical Flora of North America, edition 2, 2(1):230. Ivison, Blakeman, Taylor and Co., New York.

Solanum carolinense var. *hirsutum* Gray

Horse-nettle



Stylisma pickeringii Gray var. *pickeringii* — Pickering morning-glory

Family Convolvulaceae

Synonyms *Bonamia pickeringii* (Torrey ex M.A. Curtis) Gray, *Breweria pickeringii* (Torrey ex M.A. Curtis) Gray, *Convolvulus pickeringii* Torrey ex M.A. Curtis

Legal Status Federal species of concern; Georgia threatened.

Reasons for Current Status *Stylisma pickeringii* is rare throughout its range. Much suitable habitat and several known populations have been lost to fire suppression, housing and other development, game food plots, and highway construction.

Description Perennial, creeping (procumbent) vine. The stems ramble over the ground extending in complex patterns from a central crown, each primary stem to 1-2 m or more in length and capable of branching ad infinitum, forming, when luxurious, an intertwined network of trailing stems. The leaves are held upright, without teeth, linear, 2.5-7.0 mm long, 1-3 mm wide, apex acute to obtuse, and base narrowly tapered to a short (2 mm) petiole. The flowers are borne singly or in flat-topped clusters (cymes) with as many as five flowers, each on stalks 3-7 cm long, as long or longer than subtending leaves. There are conspicuous bracts at the base of the flowers that are leaf-like, linear, and 1.5-2.5 cm long. The flowers are white, 1.2-1.8 cm wide, with five fused petals forming a funnel-like shape. The five sepals are densely pubescent, 4-6 mm long, 3-5 mm wide, and ovate. The ovary bears one style that is evenly cleft, each style branching to 2-3 mm long (style base is 3-4 mm long), and bearing a knob-shaped (capitate) stigma. The fruit is a 1-2 seeded, globose capsule. Flowering period: late May to mid-August; fruiting period: June to October. Best search time: during flowering, since plants deteriorate rapidly toward the end of a droughty summer.

SPECIAL IDENTIFICATION FEATURES: The genus *Stylisma* is differentiated from other morning-glories by having two styles, each with knob-like stigmas, flowers on long stalks longer than subtending leaves, and small, funnel-like flowers under 2.5 cm long. The Pickering morning-glory is striking in the field with its narrow leaves held upright, usually at a 60-degree angle or more strict; whereas the other *Stylisma* species with narrow, linear leaves (*S. patens* var. *angustifolia*) has horizontally disposed leaves. *Stylisma patens*, which is a common associate, has floral bracts shorter than the flowers (less than 1 cm long). In contrast, *S. pickeringii* has conspicuous floral bracts (longer than 1 cm), surpassing the flowers in length.

Distribution Coastal Plain of New Jersey; disjunct in southeastern North Carolina to central Alabama. The majority of extant occurrences are in New Jersey and North Carolina. Alabama has only one known extant population in Autauga County, with another historic record from nearby. Recorded from eight counties in Georgia, some of which are out of the study area.

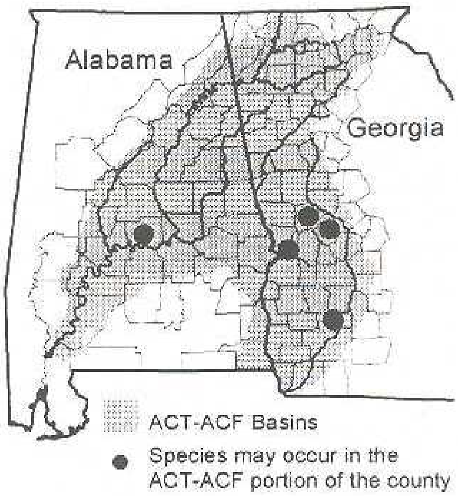
Habitat Terrestrial/scrub-shrub/sand-barren. Found in coarse, white sands on well-drained Fall Fine sandhill paleodunes (such as the fossil dunes near Albany) with low litter accumulation, no ground cover, and an open scrub oak or absent canopy. They generally occur in or near open, stunted oak-pine woodlands, such as *Pinus palustris-Quercus laevis-Q. marilandica* woodland or scrub in the sandhills of Alabama, Georgia, South Carolina, and North Carolina. Plants are generally found in full sun or partial shade. At some sites, plants occur in heavily disturbed, open areas, where the mechanical disturbance has served to reduce competition or in some way facilitate establishment of plants.

Other Biological Data Populations appear dependent on natural disturbances such as fire for maintenance of long-term vigor. Moses Ashley Curtis described this species in 1835, as a *Convolvulus*, based on his collection of the previous year from Wilmington, North Carolina. Asa Gray transferred it to *Stylisma* in 1857. A second variety, *S. pickeringii* var. *pattersonii* (Fern. and Schub.) T. Myint, occurs from Texas to Illinois and is not particularly rare. In 1901, Alfred Cuthbert made the first collection of var. *pickeringii* from Georgia, in Richmond County. It has since been found at about a dozen locations in Georgia.

Concerns Destruction, modification, or curtailment of its habitat or range by road construction, food plot

Stylisma pickeringii Gray var. *pickeringii* — **Pickering morning-glory**

establishment, commercial and housing development, trash dumping, and fire suppression.



References

Fernald, M.L., and B.G. Schubert. 1949. Some identities in *Breweria*. Rhodora 51:35-43.

Gleason, H.A., and A. Cronquist. 1991. Manual of vascular plants of northeastern United States and adjacent Canada, 2nd ed. New York Botanical Garden, Bronx. 910 pp.

Kelly, A.W., and A.S. Weakly. 1992. *Stylisma pickeringii* var. *pickeringii*, Pickering's dawnflower: results of a global status survey and proposal to list as a threatened species (draft). Unpub. report for U.S. Fish and Wildlife Service, Newton Corner, Massachusetts.

Myint, T. 1966. Revision of the genus *Stylisma* (Convolvulaceae). Brittonia 18:97-117.

Radford, A.E., H.E. Ahles, and C.R. Bell. 1968. Manual of the vascular flora of the Carolinas. Univ. of North Carolina Press, Chapel Hill. 1183 pp.

Rickett, H.W. 1966. Wild flowers of the United States, Vol. 2: The southeastern states. McGraw-Hill, New York. 688 pp.

Shinners, L.H. 1962. Synopsis of United States *Bonamia*, including *Breweria* and *Stylisma* (Convolvulaceae). Castanea 27(2):65-77.

Thalictrum subrotundum Boivin — Roundleaf meadowrue

Family Ranunculaceae

Synonyms None

Legal Status Federal species of concern.

Reasons for Current Status General rarity, possible drainage and/or degradation of habitat.

Description Lax perennial herb more or less reclining on adjacent vegetation, 1-2 m tall. Leaves alternate, ternately and pinnately decompound, upper subsessile, leaflets green, thin-membranous, mostly suborbicular, glabrous beneath, 5-15 (20) mm long, 3-12 mm wide, terminal leaflet usually 3-lobed apically, margins entire and slightly revolute, venation scarcely reticulate beneath. Plants polygamous, male flowers with 4 (-6) greenish sepals, subrotund to obovate, ca. 2 mm long, sometimes somewhat petal-like, usually inconspicuous and falling quickly, petals absent. Filaments usually white, weak and flexuous, scarcely clavate, ca. 2-4 mm long, anthers short oblong, ca. 1 mm long, blunt apically. Female flowers with numerous superior ovaries, stigmas 1-2 mm long. Fruit a sessile to subsessile achene, 3.0-3.5 mm long, 2.0-3.0 mm wide, with low inconspicuous ribs. No line drawings or photographs known.

Distribution Occurs locally in the Coastal Plain and Piedmont of South Carolina, Georgia, Florida, and Alabama. In Alabama, this plant is known from Autauga, Lee, and Clay counties. In Georgia, roundleaf meadowrue is reported from five counties in the study area, Dooly, Floyd, Haralson, Lee, and Upson; however, there have been no reports of sightings since the early 1900's

Habitat Palustrine. In low, swampy woods, swamp edges, streamsides, mesic ravine forests.

Other Biological Data Trend listed as unknown in the Federal Register 58(188), September, 1993. Confusion exists concerning the taxonomic status of this species. Keener (1976) states that "This species is poorly understood and more field work is needed to establish clearly its identity from *Thalictrum macrostylum*. In general, *T. subrotundum* tends to be more lax and taller and its leaves greener and more membranous. Pending further analysis I am retaining *T. subrotundum* as a species although it may well be a local geographic subspecies of *T. macrostylum*". Godfrey and Wooten (1981) do not treat this species, but rather state "(Possibly incl. *T. subrotundum* Boiv.)" after the description of *T. macrostylum*. Radford et al. (1968) treat this as a rare species similar to *T. macrostylum* known only from Aiken, Berkeley, and Georgetown counties, South Carolina. Clewell (1985) does not treat this species as occurring in the Florida panhandle.

Concerns Changes in water management that would decrease the wet nature of the habitat, such as drainage, would likely have a negative impact on populations. Inundation would extirpate populations.

References

Clewell, A. 1985. Guide to the vascular plants of the Florida Panhandle. Florida State Univ. Press, Tallahassee. 605 pp.

Boivin, B. 1944. American Thalictra and their old world allies. Rhodora 46:337-377, 391-445, 453-487.

Godfrey, R.K., and J.W. Wooten. 1981. Aquatic and wetland plants of southeastern United States. Vol. 2: Dicotyledons. Univ. of Georgia Press, Athens. 933 pp.

Jones, S., and N. Coile. 1988. The Distribution of the vascular flora of Georgia. Dept. of Botany, Univ. of Georgia, Athens. 230 pp.

Kaplan, S., and D. Mulcahy. 1971. Mode of pollination and floral sexuality in *Thalictrum*. Evolution 25:659-668.

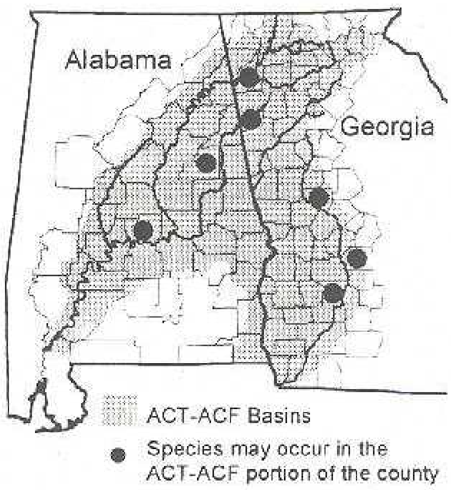
Keener, C.S. 1976. North American thalictra. Rhodora 78:457-472.

Keener, C. 1976. Studies in the Ranunculaceae of the southeastern United States. II. Thalictrum L. Rhodora 78:457-472.

Radford, A., H. Ahles, and C. Bell. 1968. Manual of the vascular flora of the Carolinas. Univ. of North Carolina Press, Chapel Hill. 1183 pp.

Small, J.K. 1903. Manual of the southeastern flora. Univ. North Carolina Press, Chapel Hill. 1554 pp.

Thalictrum subrotundum Boivin Roundleaf meadowrue



Appendix B
USGS Administrative Report

The following is the administrative report provided by the U.S. Geographical Survey, Office of Water Resources (USGS) located in Montgomery, Alabama. The administrative report was prepared to provide a summary of the results of water quality sampling that was conducted by USGS in August 2003 as part of a cooperative grant with the Central Alabama Regional Planning and Development Commission. The results of the USGS water quality sampling provide a baseline of water quality conditions in the Lower Coosa River Basin.

Effects of Land Use on Water Quality and Biology of Streams in the Lower Coosa River Basin in Alabama

By Will S. Mooty

PROBLEM

There are concerns that the Lower Coosa River Basin (LCRB) in Alabama (see map on poster) is being impacted by non-point source pollution, primarily from urban, silviculture and agricultural land use areas. The Alabama Clean Water Partnership is working with a number of organizations to develop a watershed management plan for the LCRB. As part of the planning process, the Central Alabama Regional Planning and Development Commission (CARPDC) entered into a cooperative agreement with the U.S. Geological Survey (USGS) to compile existing data and collect additional data.

OBJECTIVES

The objectives of the USGS portion of the work on the LCRB were to search USGS databases for existing water quality and biological data in the basin and collect additional data at selected sites representing the various land uses in the basin. Nine sampling sites were selected representing urban, silviculture and agricultural land use areas as well as the various ecoregions within the basin. Three additional sites were selected as background sites as a comparison of sites with relatively little development. The water-quality samples were analyzed for major ions, nutrients and pesticides. Field measurements of stream discharge, temperature, specific conductance, dissolved oxygen and pH were made at the time each sample was collected. Biological assessments were conducted by collecting benthic macroinvertebrates at each site along with a habitat assessment.

SCOPE

The initial part of the work consisted of a review of previous work done by the USGS in the LCRB, in particular, by the National Water-Quality Assessment (NAWQA) program. The NAWQA program collected data throughout the Mobile River Basin of which the LCRB is a part. One site, Shirtee Creek near Odena, was sampled in the LCRB by the NAWQA program during the period 1999-2001 (table 1). Samples were analyzed for major ions, nutrients, pesticides, suspended sediment, algae, bacteria, invertebrates and fish communities.

Water quality and benthic macroinvertebrate samples were collected in 2003 during baseflow conditions at the 12 sites in order to minimize the effects of overland storm runoff. A rapid bioassessment protocol used by the Alabama Department of Environmental Management (ADEM) was used to collect the samples. The macroinvertebrate samples were analyzed by a USGS contract lab. The water-quality samples were analyzed by the USGS National Water Quality Laboratory in Denver, Colorado.

WATER-QUALITY PARAMETERS

Water quality parameters can indicate possible causes of stream stresses. Abnormally high or low dissolved oxygen levels could indicate the presence of algae blooms which are caused by high levels of nutrients in the stream. Higher than normal specific conductance values are indicators of either point-source discharges into the stream or non-point source discharges such as overland runoff from disturbed land surfaces that increases the levels of dissolved minerals. To know what levels are considered normal there must be control or reference sites included in the sampling sites with which to compare. The occurrence of pesticides is another indication the streams have been impacted by unnatural sources.

Nutrients

Nutrients are generally considered to be the various forms of nitrogen and phosphorus that occur in water. Nitrogen occurs in various forms of ammonia, nitrite and nitrate. Phosphorus occurs as various forms of orthophosphate, phosphate and phosphorus. Some sources of these nutrients include fertilizers, septic tanks, barnyards, atmospheric contributions, municipal waste-water treatment facilities and land disturbances such as logging or land clearing. Excessive levels of nutrients can contribute to growth of algae and other nuisance plants whose death and decay can contribute to lower oxygen levels in streams.

Nitrogen is one of the most common elements on Earth. The U.S. Environmental Protection Agency (USEPA) drinking water standards set the maximum level of nitrate nitrogen as 10 mg/L and nitrite nitrogen as 1.0 mg/L (USEPA, 1990). Levels of ammonia nitrogen in excess of 2-7 mg/L have been shown to adversely affect aquatic life. The level at which ammonia becomes toxic varies according to pH and temperature levels. Excessive concentrations of nitrate nitrogen have been attributed to causing methemoglobinemia in small children. This is more commonly called “blue-baby syndrome”. Concentrations in excess of 10 mg/L as nitrogen, equivalent to 44 mg/L as nitrate, are the levels at which this becomes a problem (Hem, 1985). Many rural water supplies in the United States have concentrations of nitrate that approach or exceed 44 mg/L. This is most often attributed to nearby barnyards, septic tanks or cesspools. Farm animals produce large amounts of nitrogenous organic waste that leaches into groundwater systems and gets washed into streams by rainfall.

Nitrogen in fertilizers has increased tremendously in recent decades (Hem, 1985). Water from small and medium-sized rivers in agricultural areas around the country often has concentrations of nitrate in excess of 10 mg/L due to runoff from fertilized areas.

Levels of phosphorus above 0.1 mg/L have been shown to contribute to excessive nuisance algae and plant growth in streams (USGS, 1999). Phosphorus is a component of many fertilizers and sewage. It was used in many detergents in the 1950’s and 60’s but the public became aware of the problems this was causing with eutrophication of many lakes and streams that received sewage effluent with high levels of phosphorus. The use of phosphorus was subsequently tremendously reduced to help alleviate some of these problems. Phosphorus availability is thought to be a critical factor in eutrophication of bodies of water.

The nutrient in shortest supply, which is usually phosphorus, tends to control production rates. Thus, a reduction of phosphorus inflows may decrease productivity more quickly than would be possible by altering the influx of nitrogen which is usually readily available.

Levels of nutrients in the study area were generally low with the exception of Darby Creek in Sylacauga, Alabama (table 2). Levels of nitrate nitrogen there were measured at 7.1 mg/L which was still below the USEPA standard of 10.0 mg/L. Phosphorus measured 0.08 mg/L, just below the USEPA standard of 0.1 mg/L.

Pesticides

Pesticides are used to control weeds, insects and fungi and can often have unintended affects on humans and aquatic forms of life. The types and amounts of pesticides found are usually related to the types of land use within the stream basin. Common insecticides in agricultural areas are diazinon, chlorpyrifos, malathion, and carbaryl. Herbicides such as atrazine, simazine, and prometon often show up in urban areas where they are used on lawns and in the maintenance of highway right-of-ways. Concentrations of pesticides will vary seasonally depending on how and when they are being used in the basin and in relation to the frequency and magnitude of runoff from rain events.

Eight pesticides were detected among four of the sites in the Lower Coosa River Basin. All three urban sites had detects of various pesticides and one agricultural site had detections (table 2). Of the pesticides detected, prometon, tebuthiuron, atrazine, CIAT, and simazine are herbicides. Carbaryl, dieldrin and disulfoton are insecticides. Levels of all of the pesticides detected were below USEPA health standards.

Secondary Drinking Water-Quality Standards

Secondary drinking water-quality standards are generally not related to health risks but abnormally high levels of these parameters will adversely affect the taste, color and odor of the water and may cause discoloration of toilets, sinks, bathtubs and other fixtures. Of the parameters tested for secondary drinking water-quality standards, only manganese occurred at levels above the standard of 50 mg/L at four of the sites as well as at one of the reference sites (table 2). Manganese is a common naturally occurring element. High levels of manganese can alter the color of laundry and fixtures and can cause a bitter taste in water and drinks mixed with the water.

Major Constituents

Major constituents are those commonly present in concentrations exceeding 1.0 mg/L. The dissolved cations that constitute a major part of the dissolved-solids content generally are calcium, magnesium, sodium and potassium; the major anions are sulfate, chloride, fluoride, nitrate, and those contributing to alkalinity, mostly carbonate and bicarbonate (Hem, 1985).

Biological Assessments

Benthic macroinvertebrates are good indicators of local conditions in streams. Many species are sensitive to short-term environmental variations, thus, the diversity and types of species in a stream can indicate whether or not there are abnormal environmental stresses in a stream. Presence of a larger percentage of EPTs (ephemeroptera, plecoptera and tricoptera) is generally considered to be an indicator of less stress or impacts on a stream. These invertebrates are commonly called mayflies, stoneflies and caddisflies. More tolerant species include midges, black flies and worms.

Figure 1 shows the number of invertebrates collected at each sight as well as the breakdown per land use type. This does not give much of an indication of land use impacts due to variability of stream geology and geometry. A sandy bottomed stream will have less diverse habitat available for invertebrates than one with many rocks and logs in it. However, if the makeup of the various types of invertebrates at each site is analyzed then some patterns may begin to develop. Figure 2 shows the percentage of EPTs at each site.

Looking even further into the species distribution at each site in Figure 3, one will see that stoneflies were found at all three reference sites, none of the urban sites, two of the silviculture sites, and one of the agriculture sites. Stoneflies are generally one of the most sensitive families of invertebrates and are often one of the first to be impacted by stresses on a stream. Mayflies are also a fairly sensitive. Midges, a very tolerant family of invertebrates, will generally increase in numbers as some of the more sensitive invertebrates begin to disappear due to stresses to the stream.

Figure 1.--Species abundance in creeks in Lower Coosa River Basin.

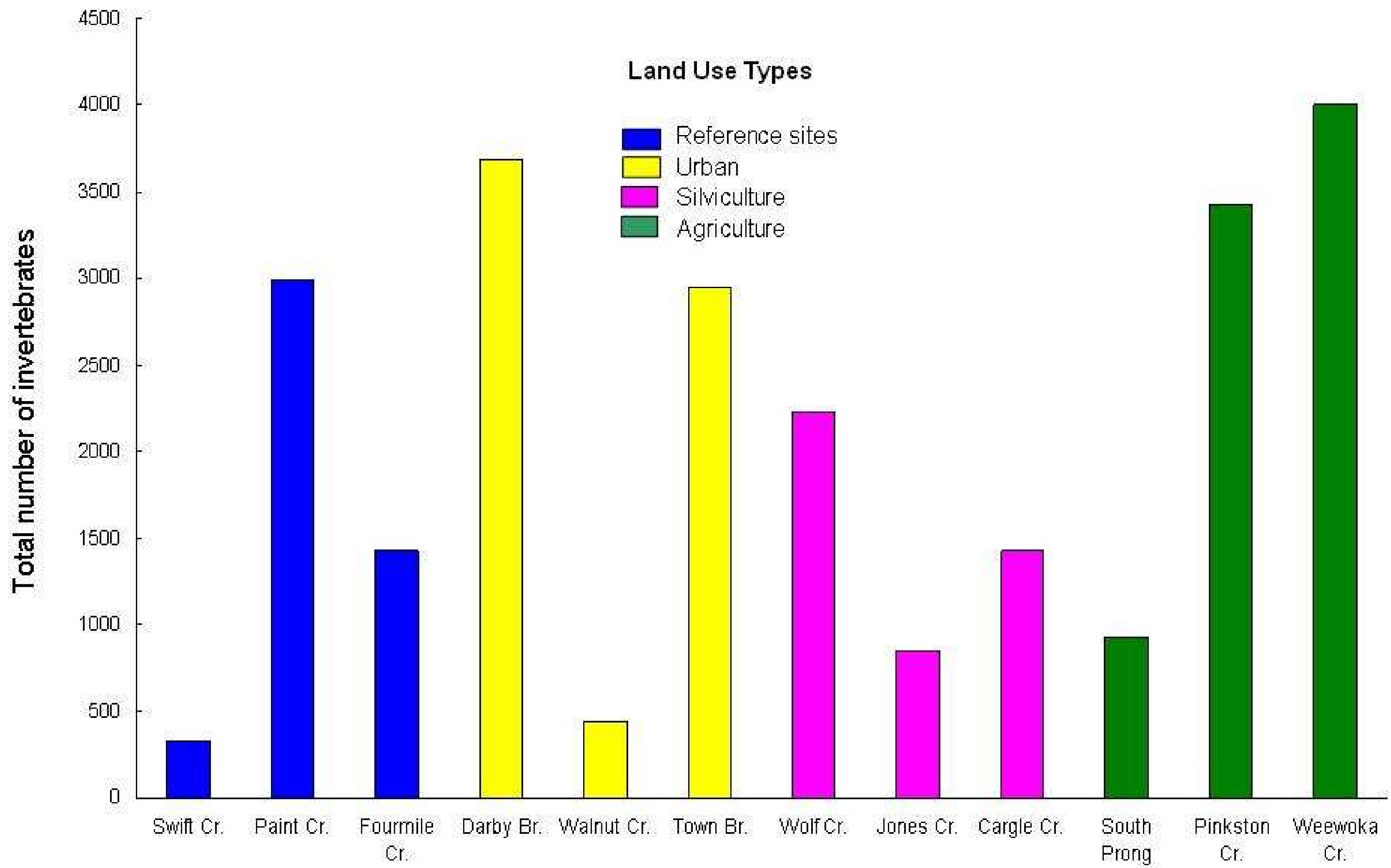


Figure 2.--Percentages of EPT in total abundance in creeks in Lower Coosa River Basin.

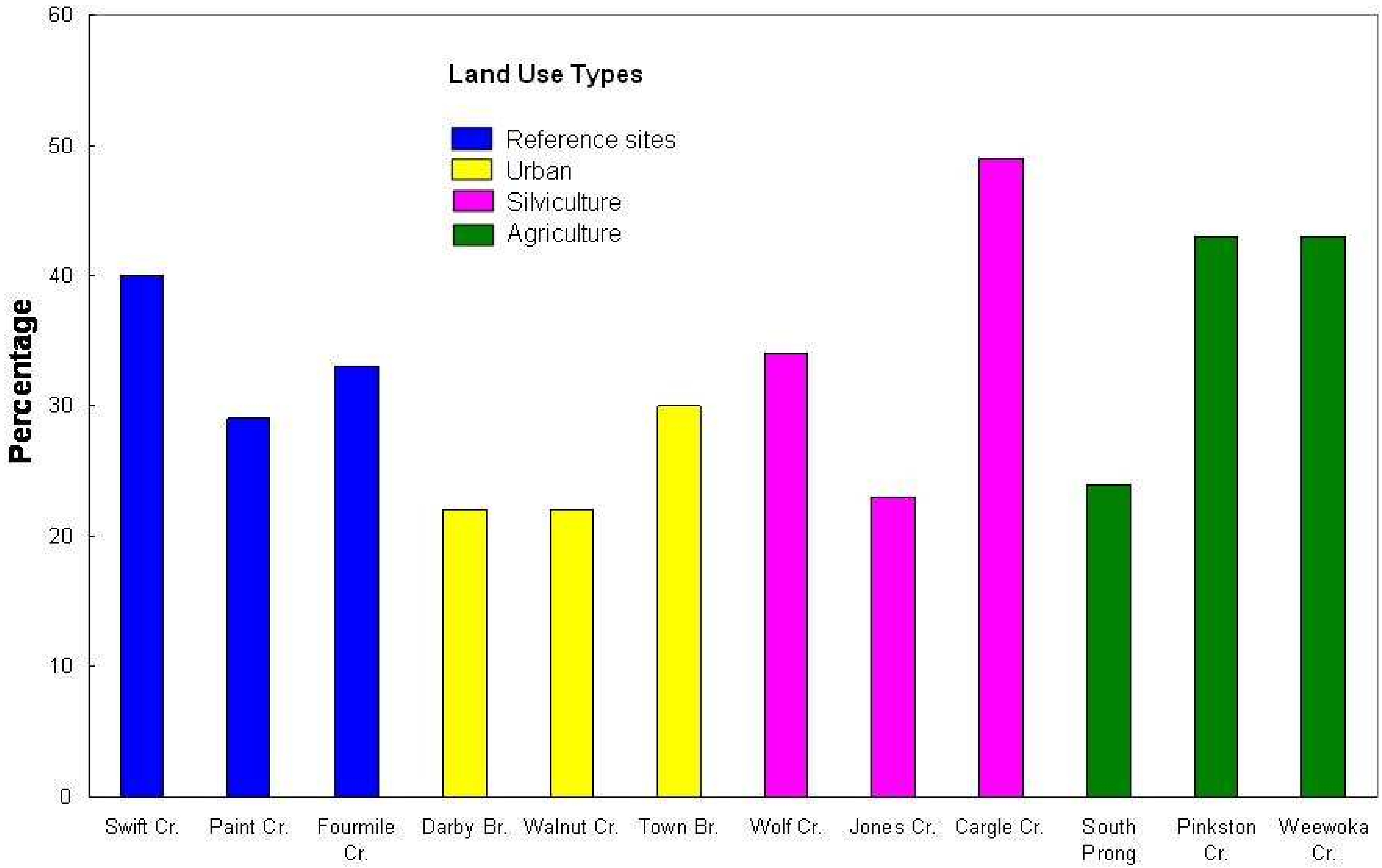
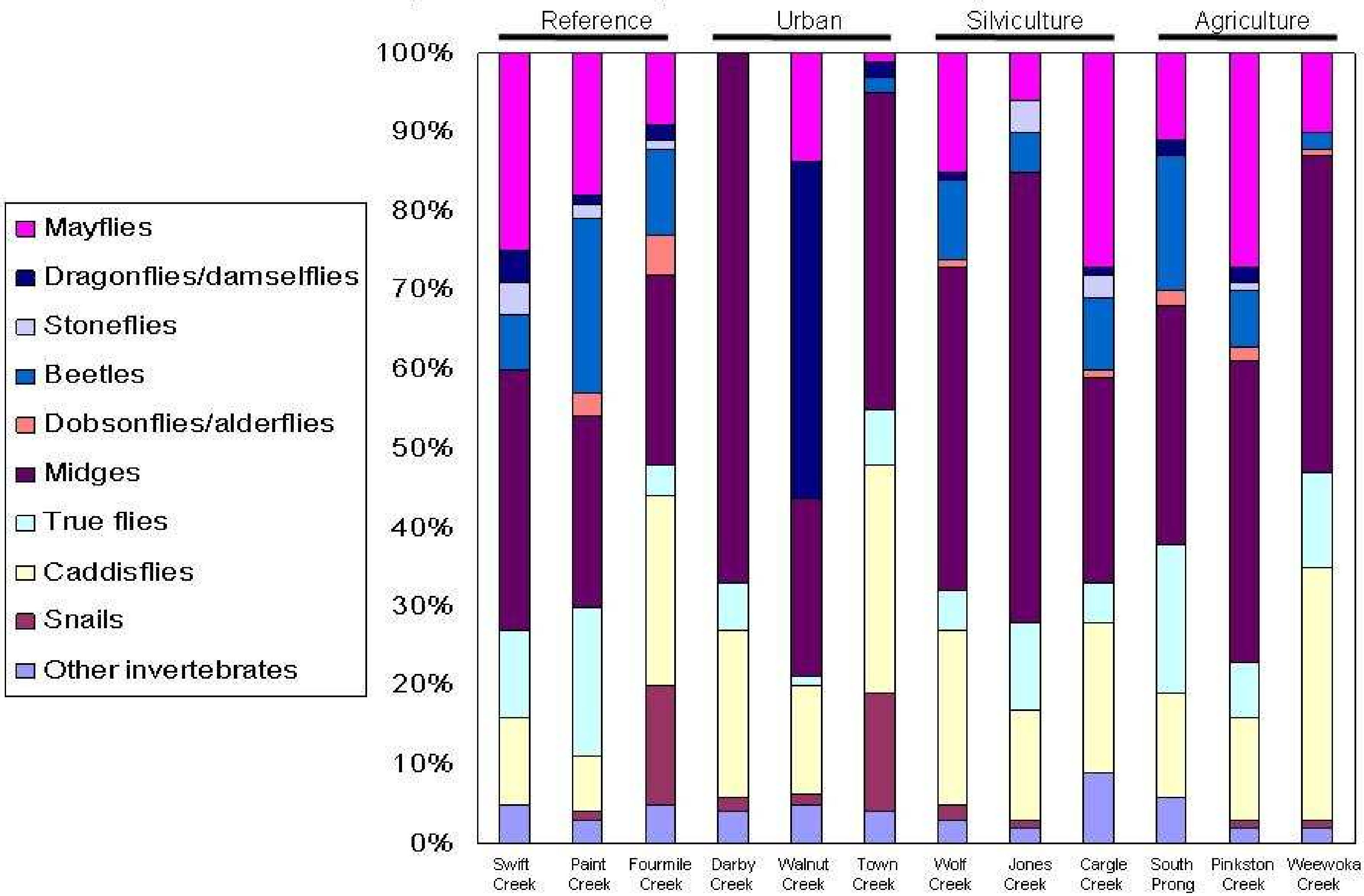


Figure 3.—Percentages of invertebrate categories at each site.



CONCLUSIONS

The work completed during this study has provided a snapshot in time of the water quality and biological conditions in several streams in the LCRB. The most important aspect of the study is not so much that it might identify areas that are being impacted by various land uses but that it has established a baseline of data in the basin that future surveys will be able to look to as a reference point with which to compare to see if land use management practices, for better or worse, are having an impact on the well being of the streams in the LCRB.

SELECTED REFERENCES

Atkins, J.B., Zappia, H., Robinson, J.L., McPherson, A.K., Moreland, R.S., Harned, D.A., Johnston, B.F., and Harvill, J.S., 2004, Water quality in the Mobile River Basin, Alabama, Georgia, Mississippi, and Tennessee, 1999-2001: U.S. Geological Survey Circular 1231, 34 p.

Hem, J. D., 1985, Study and interpretation of chemical characteristics of natural water: U.S. Geological Survey Water-Supply Paper 2254,263 p.

Moser, P.H. and Moore, J.D., 1994, Water in Alabama, 1992: Geological Survey of Alabama Circular 122J, 126 p.

U.S. Environmental Protection Agency, 1985, National primary drinking water regulations, synthetic organic chemicals, inorganic chemicals, and microorganisms; proposed rule: Federal Register, v. 50, no. 219, p. 46936-47022.

The poster at the right was produced by USGS as part of the cooperative grant project with the Central Alabama Regional Planning and Development Commission and was used in the public meetings in the second phase of the education and awareness portion of the Lower Coosa River Basin Management Plan process.

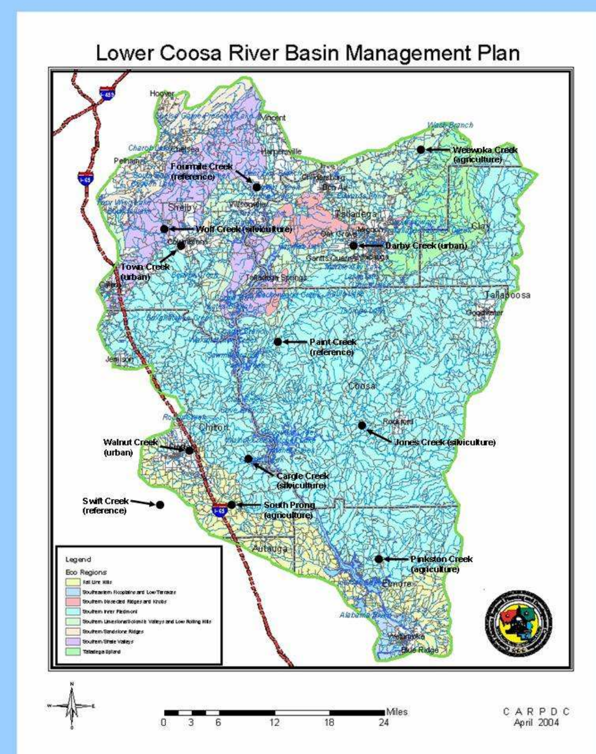
Effects of Land Use on Water Quality and Biology of Streams in the Lower Coosa River Basin in Alabama

by Will S. Mooty

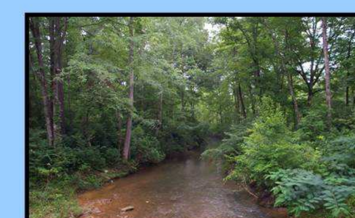
USGS science for a changing world in cooperation with Central Alabama Regional Planning and Development Commission (CARPDC)

In partnership with:
Alabama Clean Water Partnership
Coosa Co. Soil and Water Conservation Dist.
Malcolm-Pirnie, Inc.
Coosa Valley RC&D Council
Southern Company Services, Hydro Relicensing
Delaney Consultant Services, Inc.
Water Works and Sanitary Sewer Board of Montgomery

There are concerns that the Lower Coosa River Basin is being impacted by non-point source pollution. The Alabama Clean Water Partnership is working with a number of organizations to develop a watershed management plan for the Lower Coosa River. As a part of the planning process, the CARPDC entered into a cooperative agreement with the USGS to compile existing data and collect additional data. The data will be used to characterize the water-quality and biological conditions within basins affected by various land uses and establish a baseline dataset. Twelve streams were selected for sampling. Nine of the sampling sites represented the three major land-use categories present in the basin which are urban, silviculture and agriculture. The remaining three sites represent unimpacted conditions, i.e., reference sites. Samples were collected under base-flow conditions. Water samples were analyzed for nutrients, pesticides, and major ions. Field measurements of temperature, pH, dissolved oxygen, specific conductance and stream discharge were collected during each site visit. In addition, benthic macroinvertebrate communities and habitat were assessed using Alabama Department of Environmental Management protocols.



Samples were collected using standard USGS and ADEM protocols.



Riparian buffer zones along streams help to reduce non-point source runoff into the streams.

Table 1.--Summary of water-quality parameters in selected sites in the Lower Coosa River Basin.

	Water Quality Parameter	Standards	Swift Cr.	Fourmile Cr.	Paint Cr.	Walnut Cr.	Town Cr.	Darby Br.	Cargle Cr.	Wolf Cr.	Jones Cr.	Pinkston Cr.	South Prong	Weewoka Cr.
	Land use		Reference	Reference	Reference	Urban	Urban	Urban	Silviculture	Silviculture	Silviculture	Agriculture	Agriculture	Agriculture
	Date sampled		8/18/2003	8/12/2003	8/11/2003	8/19/2003	8/12/2003	8/11/2003	8/18/2003	8/12/2003	8/13/2003	8/13/2003	8/18/2003	8/11/2003
	Discharge (cubic ft/sec)		32.1	3.83	23.7	13.6	0.706	0.81	9.42	0.515	11.5	2.23		26
	Drainage area (mi.2)		24.7	13.4	16.7	28.6	2.86	2	10.4	13.3	5.66	3.09	14.1	23.3
	Dissolved oxygen (mg/L)	>5.0 (1)	7.9	6.9	8.6	7.9	11.5	6.8	8.7	7.5	8.8	7.9	7.2	8.5
	pH	6.5-9.0 (1)	6.4	7.7	6.9	6.7	8	7	6.6	6.4	6.8	6.7	6.2	7.5
	Specific conductance (uS/cm)		33	279	37	80	315	272	31	46	35	55	33	215
	Water temperature (Celsius)		24.3	23	22.8	27.8	21.7	22.7	23.3	23.5	22.2	22.5	25	20.2
	Hardness		10	150	12	28	160	120	8	17	11	14	11	120
	Calcium (mg/L)		2	50.3	2.82	7.78	55	31.3	1.54	3.54	2.53	3.53	2.54	24.2
	Magnesium (mg/L)		1.32	5.81	1.17	2.09	6.27	10.8	0.976	1.97	1.18	1.36	1.18	13.4
	Potassium (mg/L)		1.01	1.01	0.61	1.43	0.96	3.28	1.14	1.02	1	1.5	0.93	0.98
	Sodium (mg/L)	20(3)	1.56	1.96	2.38	2.5	4.63	4.43	1.92	1.99	1.84	3.86	1.75	1.95
	Alkalinity (mg/L as CaCO3)		8	137	15	25	146	73	8	16	12	18	10	97
	Chloride (mg/L)	250 (3)	3.18	3.42	1.58	5.4	4.17	7.9	2.59	1.61	4.26	4.35	3.01	3.41
	Fluoride (mg/L)	2 (3)	0.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	0.2	<.2
	Silica (mg/L)		7.69	8.13	14.1	8.22	12.1	12.4	8.19	8.5	14.3	16.1	6.87	9.75
	Sulfate (mg/L)	250 (3)	1.2	4.3	1.5	3.5	9.8	10.7	2.1	3.6	0.7	0.7	0.9	3.5
	Total dissolved solids (mg/L)	500 (3)	33	169	22	65	178	159	28	45	33	62	40	115
Nutrients	Ammonia+org-N, filtered as N		0.15	0.2	0.09	0.3	0.07	1.2	0.07	0.22	<.1	0.14	0.26	0.07
Nutrients	Ammonia+org-N, unfiltered as N		0.23	0.19	0.12	0.41	0.1	1.2	0.09	0.31	0.06	0.19	0.37	0.09
Nutrients	Ammonia (mg/L)					0.1		1.01						<.04
Nutrients	Ammonia as N (mg/L)	2-7 (1,4)	<.04	<.04	<.04	0.08	<.04	0.78	<.04	<.04	<.04	<.04	0.03	
Nutrients	Nitrate (mg/L)							31.5						
Nutrients	Nitrate as N (mg/L)	10.0 (2)						7.11						
Nutrients	Nitrite+nitrate as N (mg/L)	10.0 (2)	0.34	0.22	<.06	0.43	0.52	7.3	0.14	0.07	<.06	0.37	0.09	1.39
Nutrients	Nitrite (mg/L)							0.624						
Nutrients	Nitrite as N (mg/L)	1.0 (2)	<.008	<.008	<.008	<.008	<.008	0.19	<.008	<.008	<.008	<.008	<.008	<.008
Nutrients	Organic nitrogen, filtered (mg/L)					0.22		0.37						
Nutrients	Org. nitrogen, unfiltered (mg/L)					0.33		0.46						
Nutrients	Orthophosphate (mg/L)							0.138						
Nutrients	Orthophosphate as P (mg/L)		<.02	<.02	<.02	<.09	<.02	0.04	<.02	<.02	<.18	<.18	<.02	<.02
Nutrients	Phosphorus, filtered (mg/L)		0.003	0.011	0.005	0.004	0.007	0.059	0.004	0.007	<.004	0.007	0.005	0.01
Nutrients	Phosphorus, unfiltered (mg/L)	0.1 (5)	0.016	0.021	0.017	0.02	0.013	0.08	0.013	0.033	0.005	0.027	0.026	0.012
Nutrients	Total nitrogen, filtered (mg/L)		0.49	0.41		0.73		8.5		0.29		0.51	0.34	
Nutrients	Total nitrogen, unfiltered (mg/L)		0.57	0.41		0.84	0.62	8.5		0.39		0.56	0.45	
	Iron (ug/L)	300 (3)	65	12	114	187	7	13	52	251	25	127	235	4
	Mangenese (ug/L)	50 (3)	59.5	27.3	22.6	222	27.6	49.6	11.8	84.9	12.8	57.2	154	29.8
Pesticides	CIAT (ug/L)							0.013						0.056
Pesticides	Atrazine (ug/L)	3 (2)					0.007	0.166						0.061
Pesticides	Disulfoton (ug/L)	3 (2)						0.06						
Pesticides	Prometon (ug/L)					detected	0.01	0.03						
Pesticides	Tebuthiuron (ug/L)					0.02		0.07						
Pesticides	Dieldrin (ug/L)						0.008							
Pesticides	Simazine (ug/L)	4 (2)					0.012							
Pesticides	Carbaryl (ug/L)	2 (2)				0.017								

(1) Levels outside of which aquatic life is affected, (2) EPA drinking water standards, (3) Secondary water quality standards; taste, odor and color affected, (4) Parameter is pH and temperature dependent, (5) Levels above this concentration contribute to excessive algal growth.

Figure 1.--Species abundance in creeks in Lower Coosa River Basin.

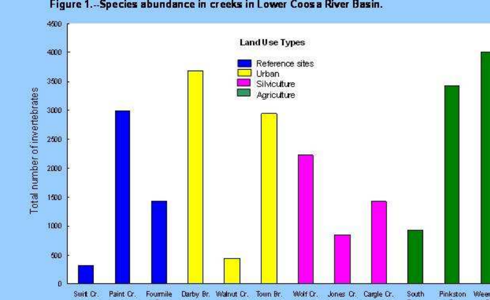
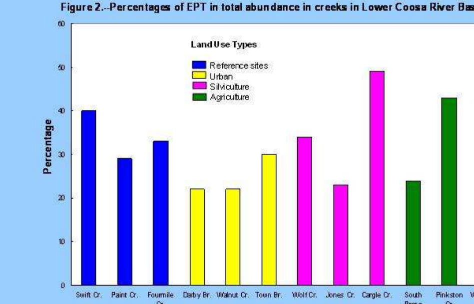


Figure 2.--Percentages of EPT in total abundance in creeks in Lower Coosa River Basin.

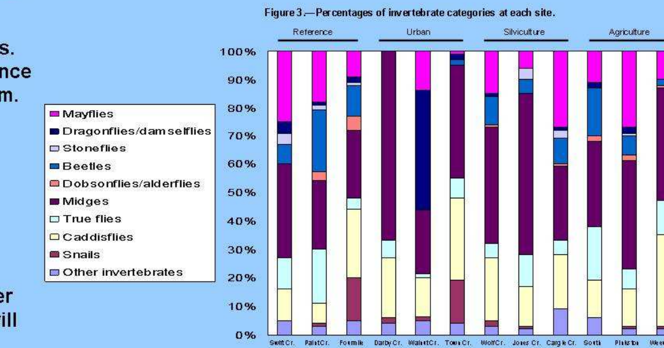


Benthic macroinvertebrates are good indicators of local conditions in streams. Many species are sensitive to short-term environmental variations, thus, the diversity and types of species in a stream can indicate whether or not there are abnormal environmental stresses in the stream. Presence of a larger percentage of EPTs (mayflies, stoneflies and caddisflies) are generally considered to be indicators of less stress or impacts on a stream. More tolerant species include midges, black flies and worms.

Water-quality parameters can indicate possible causes of stream stresses. Abnormally high or low dissolved oxygen levels could indicate the presence of algae blooms which are caused by high levels of nutrients in the stream. Higher than normal specific conductance values are indicators of either point-source discharges into the stream or non-point sources such as overland runoff from disturbed land surfaces increasing the levels of dissolved minerals in the stream. To know what levels are considered normal there must be control or reference sites included in the sampling sites with which to compare. The occurrence of pesticides is another indication of streams that have been impacted by unnatural sources.

Perhaps the most significant result of this study is that a baseline of water quality and biological data has been established so that future surveys will be able to better determine impacts of land use.

Figure 3.--Percentages of invertebrate categories at each site.



Land-use disturbances such as logging and farming, if not managed properly, can increase sediment runoff to streams which can be detrimental to the quality of water and sensitive life forms in the stream.

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References:

U.S. Environmental Protection Agency, 1990, Drinking Water Regulations and Health Advisories: 538 p.

Atkins, J.B., Zappia, H., Robinson, J.L., McPherson, A.K., Moreland, R.S., Harned, D.A., Johnston, B.F., Harvill, J.S., 2004, Water quality in the Mobile River Basin, Alabama, Georgia, Mississippi, and Tennessee, 1999-2001, U.S. Geological Survey Circular 1231, 34 p.

Appendix C
Water Quality Monitoring Data

Included in this appendix is a list of the previous data collected including the streams that were monitored during the basinwide screening assessment for the Coosa River Basin by the Aquatic Assessment Unit of the Field Operations Division of the Alabama Department of Environmental Management (ADEM) in 2000. The results of the screening assessment may be found in the *Surface Water Quality Screening Assessment of the Coosa River Basin – 2000 (Screening Assessment)*, which was released by ADEM in 2002. The Coosa River Basin will be assessed again in 2005, according to the five-year rotational schedule that in cited in the *Screening Assessment*.

Table 8c. List of previous water quality assessments conducted on streams within the Lower Coosa River Cataloging from 1990-1999. Chemical assessments are indicated when biological assessments were not conducted.

Waterbody	*Date(s)*	*Assessment Type**	*Reference +*
Lower Coosa (0315-0107)			
Beeswax Cr	1999	C	5
Buxahatchee Cr	1996	C	2, 6
Chestnut Cr	1997	C	5
Coosa River	1990, 1991, 1995, 1996, 1999	C	1, 2, 7
Dry Cr, UT to	1996	C	2
Finikochika Cr	1996	C	2
Fourmile Creek	1992-1999	B	8
Hatchet Cr	1996, 1998-99	C	2, 7
Hatchet Creek, UT to	1997	C	5
Mud Cr	1999	C	5
Peckerwood Cr	1997	C	5
Shirtee Creek	1997-1999	C	1
Socapatoy Cr	1996	C	2
Stewart Br	1999	C	5
Tallaseehatchee Cr	1991, 1995, 1998-99	C	1, 6, 7
Taylor Cr	1999	B, C	6
Weogufka Creek	1993, 1995, 1996, 1998-99	B, C	2, 4, 7

* B= Biological Assessment (either fish and/or aquatic macroinvertebrate); C= Chemical Assessment
\+ Key to References is located in Appendix G.

References for Historical Assessments Conducted in the Coosa River Basin as cited in the *Surface Water Quality Screening Assessment of the Coosa River Basin – 2000*

1. ADEM. 1998. Water Quality Report to Congress for Calendar Years 1996 and 1997. Alabama Department of Environmental Management. Montgomery, Alabama.

2. ADEM. 1999a. Alabama Clean Water Strategy Water Quality Assessment Report (1996). Alabama Department of Environmental Management. Montgomery, Alabama.

4. ADEM. 2000a. Ecoregional reference site data collected by ADEM 1992 to 2000 (unpublished). Field Operations Division, Alabama Department of Environmental Management. Montgomery, Alabama.

5. ADEM. 2000b. Alabama Monitoring and Assessment Program (ALAMAP) data collected by ADEM 1997 to 2000 (unpublished). Field Operations Division, Alabama Department of Environmental Management. Montgomery, Alabama.

6. ADEM. 2000c. Water quality monitoring data collected by ADEM in support of CWA §303(d) listing and de-listing decisions 1999-2000 (unpublished). Field Operations Division, Alabama Department of Environmental Management. Montgomery, Alabama.

7. ADEM. 2000i. Water quality monitoring data from tributaries of the Coosa River basin reservoirs collected by Alabama Universities - Auburn University and Auburn University at Montgomery under contract with ADEM (2000, unpublished). Water Division, Alabama Department of Environmental Management. Montgomery, Alabama.

8. ADEM. 2000e. Aquatic macroinvertebrate bioassessment quality assurance/quality control assessments 1991 to 2001 (unpublished). Field Operations Division, Alabama Department of Environmental Management. Montgomery, Alabama.

Appendix D
Watershed Rating Factor Worksheets

Included in this appendix are the rating factor worksheets that were referenced in Chapter 12 of the Lower Coosa River Basin Management Plan. The worksheets were used to rate the 11-digit HUC watersheds as high, moderate or low priority watersheds based on the existing conditions within each watershed. Worksheets are included for those factors where the watershed score was based on a ratio, which were animal density per watershed, housing density per watershed and septic system density per watershed.

Animal Density Per Watershed

HUC	Watershed	Total Animals of All Types	Watershed Area (in acres)	Acres per Animal
010	Tallassehatchee Creek	4,285	128,147	29.91
020	Walthall Branch	1,200	8,611	7.18
030	Yellowleaf Creek	2,940	118,484	40.30
040	Kahatchee Creek	548	15,836	28.90
050	Beeswax Creek	2,000	36,371	18.19
060	Cedar Creek	1,160	42,594	36.72
070	Peckerwood Creek	668	53,130	79.54
080	Spring Creek	700	14,511	20.73
090	Buxahatchee Creek	1,150	44,551	38.74
100	Waxahtachee Creek	2,310	87,372	37.82
110	Upper Hatchet Creek	885	98,801	111.64
120	Socapatoy Creek	600	48,708	81.18
130	Middle Hatchet Creek	870	84,188	96.77
140	Weogufka Creek	2,515	82,322	32.73
150	Lower Hatchet Creek	0	38,844	--
160	Walnut Creek	7,700	112,675	14.63
170	Chestnut Creek	1,555	80,961	52.06
180	Weoka Creek	1,439	121,204	84.23
190	Pigeon Roost Creek	0	11,288	--
200	Taylor Creek	0	28,913	--
	Basin	32,525	1,257,511	38.66

Scoring Factors	
Range	Score
61 or More Acres Per Animal	1
46 to 60 Acres Per Animal	2
31 to 45 Acres Per Animal	3
16 to 30 Acres Per Animal	4
0 to 15 Acres Per Animal	5

Housing Density Per Watershed

HUC	Watershed	Number of Housing Units	Watershed Area (in acres)	Acres per Housing Unit
010	Tallassehatchee Creek	12,011	128,147	10.67
020	Walthall Branch	324	8,611	26.58
030	Yellowleaf Creek	4,907	118,484	24.15
040	Kahatchee Creek	1,195	15,836	13.25
050	Beeswax Creek	2,377	36,371	15.30
060	Cedar Creek	1,431	41,594	29.07
070	Peckerwood Creek	479	53,130	110.92
080	Spring Creek	1,226	14,511	11.84
090	Buxahatchee Creek	1,683	44,551	26.47
100	Waxahtachee Creek	2,758	87,372	31.68
110	Upper Hatchet Creek	1,340	96,450	71.98
120	Socapatoy Creek	727	48,708	67.00
130	Middle Hatchet Creek	814	84,188	103.43
140	Weogufka Creek	1,754	78,757	44.90
150	Lower Hatchet Creek	277	38,844	140.23
160	Walnut Creek	5,238	112,675	21.51
170	Chestnut Creek	4,468	80,961	18.12
180	Weoka Creek	2,861	121,204	42.36
190	Pigeon Roost Creek	1,299	11,288	8.69
200	Taylor Creek	1,876	28,913	15.41
	Basin	49,045	1,250,595	25.50

Scoring Factors	
Range	Score
41 Acres of More per Unit	1
31 to 40 Acres per Unit	2
21 to 30 Acres per Unit	3
11 to 20 Acres per Unit	4
0 to 10 Acres per Unit	5

Septic System Density Per Watershed

HUC	Watershed	Number of Septic Systems	Watershed Area (in acres)	Septic System Density
010	Tallassehatchee Creek	15	128,147	8,543.13
020	Walthall Branch	200	8,611	43.06
030	Yellowleaf Creek	3,000	118,484	39.49
040	Kahatchee Creek	0	15,836	--
050	Beeswax Creek	3,000	36,371	12.12
060	Cedar Creek	0	42,594	--
070	Peckerwood Creek	150	53,130	354.20
080	Spring Creek	1,000	14,511	14.51
090	Buxahatchee Creek	700	44,551	63.64
100	Waxahatchee Creek	1,650	87,372	52.95
110	Upper Hatchet Creek	450	98,801	219.56
120	Socapatoy Creek	500	48,708	97.42
130	Middle Hatchet Creek	500	84,188	168.38
140	Weogufka Creek	500	82,322	164.64
150	Lower Hatchet Creek	80	38,844	485.55
160	Walnut Creek	750	112,675	150.23
170	Chestnut Creek	2,153	80,961	37.60
180	Weoka Creek	1,572	121,204	77.10
190	Pigeon Roost Creek	0	11,288	--
200	Taylor Creek	0	28,913	--
	Basin	16,220	1,257,511	77.53

Scoring Factors

Range	Score
121 Acres or More per System	1
91 to 120 Acres per System	2
61 to 90 Acres per System	3
31 to 60 Acres per System	4
0 to 30 Acres per System	5

Appendix E
Watershed Management Resources

Appendix E includes a summary of a number of federal, state and local government watershed management programs, along with a brief description of some local industry, organizational, and non-profit programs that are applicable to the watershed management efforts of the Lower Coosa River Basin. Much of the resource program information was drawn from the Black Warrior River Watershed Management Plan that was produced in 2004 by the Black Warrior Clean Water Partnership, with Kellie Johnston, of CAWACO RC&D, serving as facilitator of that organization.

Federal Programs

Environmental Protection Agency(EPA)
CWA Section 319

Clean Water Initiative

The Clean Water Initiative of the Clinton Administration includes the Clean Water Action Plan. This plan includes actions designed to increase aid to states and communities for combating nonpoint source pollution. Most of this is done through existing programs and increased coordination among agencies. The action plan has four main tools that will used to achieve its objectives:

1. Watershed Approach-Alabama is already actively researching and protecting surface water resources using the watershed approach.
2. Strong federal and state standards for water quality and the effects of nonpoint-source pollution.
3. Natural resource stewardship. To encourage federal natural resource and conservation agencies to assist state and local organizations to protect and restore watersheds.
4. Education of citizens and government officials about watershed health, drinking water, and fish.

Long-term objectives of the Clean Water Action Plan are to restore 75 percent of U.S. watersheds to fishable/swimmable condition by the year 2005, and to ensure that at least 95 percent of the population served by community water systems receives drinking water meeting all health-based standards.

Watershed Information Network

The Watershed Information Network (www.epa.gov/win) organizes information and services for watershed practitioners. The network provides information about major laws governing water resources and links to watershed partners, including federal and state agencies and local watershed groups. It provides descriptions, application procedures, and deadlines for funding and technical assistance programs.

Watershed Academy

The EPA provides an educational resource that offers many on-line training modules. Individuals can use the modules at their own pace to learn about topics including ecology, watershed planning, and best management practices.
(www.epa.gov/owow/watershed/wacademy)

Pollutant Trading

One way in which EPA is encouraging improved watershed management is within-watershed pollution credit trading. Entities that reduce pollutant levels below required levels can sell or trade credits to other entities in the same watershed. EPA expects this practice to create economic incentives as well as facilitate compliance with water-quality regulations while causing a minimum of financial hardship.

U.S. Department of the Interior

Office of Surface Mining

The Surface Mining Control and Reclamation Act of 1977 (SMCRA) created the Office of Surface Mining (OSM) in the U.S. Department of the Interior. SMCRA provides authority to OSM to oversee the implementation of and provide Federal funding for State regulatory and abandoned mine lands programs that have been approved by OSM as meeting the minimum standards specified by SMCRA. These programs are administered by the Alabama Surface Mining Commission (ASMC) and the Alabama Department of Industrial Relations (ADIR). OSM's role is to focus on on-the-ground reclamation success and end results than on processes. It emphasizes assisting the State in improving its regulatory and abandoned mine lands programs by identifying needs and offering financial, technical, and programmatic assistance to strengthen the State programs.

U.S. Fish and Wildlife Service

Critical Habitat Proposed for Freshwater Mussels

The U.S. Fish and Wildlife Service proposed that portions of rivers and streams, totaling some of 1,093 miles in Alabama, Georgia, Mississippi, and Tennessee, be designated as critical habitat for 11 federally listed freshwater mussels. All 11 mussels were listed March 17, 1993, under the Endangered Species Act (ESA). The final determination of critical habitat was made in 2004.

Mobile River Basin Aquatic Ecosystem Recovery Plan

The Mobile River Basin Aquatic Ecosystem Recovery Plan was prepared by the Service's Jackson, Mississippi Field Office, and released for public review in September 1994. In December 1994, the Alabama Department of Economic and Community Affairs, Office of Water Resources, requested a meeting among the Basin's stakeholders and the Service to discuss the draft recovery plan, its implementation, private and State concerns with the plan, the Endangered Species Act, and the Service's past and future actions within the Basin. Participating stakeholders included State and Federal government agencies, environmental organizations, landowners, and numerous business and industry representatives. Bimonthly meetings were conducted over the next 18 months to exchange information concerning the values and status of the Basin's animal and plant life, human uses and values of its rivers and watersheds, and current regulations and programs to protect and manage the Basin's resources. During these discussions, participants agreed to form the Mobile River Basin Coalition to provide a forum for all interest groups who have a stake in the Basin. Among other activities, the Coalition has worked with the Service.

The Recovery Plan was developed to address the immediate recovery objectives of 22 aquatic species endemic to the Mobile River Basin of which the Lower Coosa River Basin is a sub-basin. The Plan acknowledges that irreversible changes to extensive portions of the Basin have occurred to meet human needs, and these changes have resulted in natural resource losses. It emphasizes the uniqueness and value of the Basin's imperiled native species and the aquatic and riparian habitats on which they depend. The Plan identifies the threats currently affecting these habitats and their biota. It also recognizes that humans and their activities are integral components of the ecosystem, and that recovery strategies and actions must allow for sustainable economic growth and other human needs.

U.S. Geological Survey

As the primary Federal science agency for water-resource information, the U.S. Geological Survey (USGS) monitors the quantity and quality of water in the Nation's rivers and aquifers, to assesses the sources and fate of contaminants in aquatic systems, develops tools to improve the application of hydrologic information, and ensures that its information and tools are available to all potential users.

Major USGS Initiatives:

Cooperative Water Program. The Mission of the USGS Cooperative Water Program is to provide reliable, impartial, and timely information needed to understand the Nation's water resources through a program of shared efforts and funding with State, Tribal, and local partners to enable decision makers to wisely manage the Nation's water resources.

For more than 100 years, the Cooperative Program has been a highly successful cost-sharing partnership between the USGS and water-resource agencies at the State, local, and tribal levels. Throughout its history, the Program has made important contributions to meeting USGS mission requirements, developing meaningful partnerships, sharing Federal and non-Federal financial resources, and keeping the agency focused on real-world problems.

National Streamflow Information Program. NSIP. The National Streamflow Information Program (NSIP) provides information on the quantity and timing of the streamflow in the Nation's rivers. It is a vital asset that safeguards lives and property and helps to ensure adequate water resources for a healthy environment and economy. The U.S. Geological Survey operates and maintains approximately 7,000 streamguages, which provide long-term, accurate, and unbiased information that meets the needs of many diverse users.

The USGS's National Streamgaging Network consists of a core of USGS funded and operated streamgages, streamgages operated by the USGS but funded in cooperation with other agencies, and streamgages funded and operated by other agencies that provide data appropriate to meet NSIP goals. Although the National Streamgage Network is operated primarily by the USGS, it is funded by a partnership of 800 agencies at the Federal, State, Tribal, and local levels.

The USGS National Streamflow Information Program (NSIP) is designed with five components, one of which is to provide a "backbone" or core of streamgages that are of such critical importance to the National Streamgage Network that their operation should be assured with Federal funds. NSIP was created in response to Congressional and stakeholder concerns about (1) a loss of streamgages, (2) a disproportionate loss of streamgages with a long period of record, (3) the inability of the USGS to continue operating high-priority streamgages when partners discontinue funding and (4) the increasing demand for streamflow information due to new resource-management issues and new data-delivery capabilities.

National Water Quality Assessment Program. NAWQA.USGS implemented the National Water-Quality Assessment (NAWQA) Program to support national, regional, and local information needs and decisions related to water-quality management and policy. Shaped by and coordinated with ongoing efforts of other Federal, State, and local agencies, the NAWQA Program is designed to answer: What is the condition of our Nation's streams and ground water? How are the conditions changing over time? How do natural features and human activities affect the quality of streams and ground water, and where are those effects most pronounced?

By combining information on water chemistry, physical characteristics, stream habitat, and aquatic life, the NAWQA Program aims to provide science-based insights for current and emerging water issues and priorities. NAWQA results can contribute to informed decisions that result in practical and effective water-resource management and strategies that protect and restore water quality.

Toxic Substances Hydrology (Toxics) Program. The U.S. Geological Survey (USGS) Toxic Substances Hydrology (Toxics) Program was initiated in 1982. The goal of the Program is to provide scientific information on the behavior of toxic substances in the Nation's hydrologic environments. Contamination of surface water, ground water, soil, sediment, and the atmosphere by toxic substances is among the most significant issues facing the Nation. Contaminants such as excessive nutrients, organic chemicals, metals, and pathogens enter the environment, often inadvertently, via industrial, agricultural, mining, or other human activities. The extent of their migration and their persistence often are difficult to ascertain. Estimates of the costs and time frames for cleanup of contamination and protection of human and environmental health can best be described as astounding, despite continual efforts by governments and industries worldwide to improve environmental technologies.

The Toxics Program conducts: (1) intensive field investigations of representative cases of subsurface contamination at local releases; and (2) watershed- and regional-scale investigations of contamination affecting aquatic ecosystems from nonpoint and distributed point sources. These investigations occur over a wide range of scales -- from intense point sources, such as leaks or discharges from industrial facilities; to multiple, closely spaced releases, such as domestic septic systems; to relatively uniform releases that occur over broad areas with similar land-use practices, such as agricultural and residential land uses.

The Toxics Program is coordinated with the U.S. Environmental Protection Agency, the U.S. Department of Agriculture, the Department of Defense, the Department of Energy, the Nuclear Regulatory Commission, and other U.S. Department of the Interior agencies to ensure that current and future research priorities are being addressed. The Program complements the water-quality monitoring and assessment programs of USGS and others by identifying new issues and emerging contaminants, and developing the knowledge and methods needed to direct their future activities. Collaboration and information sharing occurs with numerous state and local governments, and non-governmental entities. The long term cooperation and assistance offered by the Federal, State, and local agencies, and by private entities that administer or own the Program's research sites has been essential to the success of the Toxics Program.

Ground Water Resources Program. The Ground-Water Resources Program encompasses regional studies of ground-water systems, multidisciplinary studies of critical ground-water issues, access to ground-water data, and research and methods development. The program provides unbiased scientific information and many of the tools that are used by Federal, State, and local management and regulatory agencies to make important decisions about the Nation's ground-water resources.

State Water Resources Research Institute Program. The State Water Resources Research Institute (WRRI) Program is authorized by section 104 of the Water Resources Research Act of 1984. It is a Federal-State partnership which:

- Plans, facilitates, and conducts research to aid in the resolution of State and regional water problems
- Promotes technology transfer and the dissemination and application of research results
- Provides for the training of scientists and engineers through their participation in research
- Provides for competitive grants to be awarded under the Water Resources Research Act
-

The state water resources research institutes authorized by the Act are organized as the National Institutes for Water Resources (NIWR). NIWR cooperates with the USGS in establishing total programmatic direction, reporting on the activities of the Institutes, coordinating and facilitating regional research and information and technology transfer, and in operating the NIWR-USGS Student Internship Program.

National Research Program

The National Research Program (NRP) conducts basic and problem oriented hydrologic research in support of the mission of the U.S. Geological Survey (USGS). Relevant hydrologic information provided by the USGS is available today to assist the Nation in solving its water problems because of a conscious decision made in years past to invest in research. The NRP is designed to encourage pursuit of a diverse agenda of research topics aimed at providing new knowledge and insights into varied and complex hydrologic processes that are not well understood. The emphasis of these research activities changes through time, reflecting the emergence of promising new areas of inquiry and the demand for new tools and techniques with which to address water-resources issues. Knowledge gained and methodologies developed in this program apply to all of the hydrologic investigations of the USGS, to the water-oriented investigations and operations of other agencies, and to the general scientific community.

USGS Environmental Affairs Program

As a Federal agency with special expertise in the earth sciences, the U.S. Geological Survey (USGS) is required to evaluate, review, and prepare technical comments on environmental impact statements (EIS) and associated documents. In addition, through its Environmental Affairs Program (EAP), the USGS has established policies to implement the National Environmental Policy Act (NEPA) and other related acts. Guidance has been developed to ensure USGS compliance with NEPA and associated environmental and hazardous waste laws and regulations.

Other USGS initiatives relating to water quality include the following:

- Branch of Quality Systems. Part of the Office of Water Quality this program manages and operates water-quality quality-assurance projects for the USGS and provides training and coordination on developing quality-assurance programs for the USGS

- Branch of Geophysics. Part of the Office of Ground Water. This program provides a national focus to the regional and State water resources geophysical activities.

- Branch of Geophysical Applications and Support Chlorofluorocarbon Laboratory. The Reston Chlorofluorocarbon Laboratory provides analytical services for determination of the chlorofluorocarbons (CFCs) CFC-11, CFC-12, and CFC-113, sulfur hexafluoride (SF6), and other gases in air and water samples in support of USGS hydrologic studies to trace the flow of young water (0- to 50-year time scale) and to determine the time elapsed since recharge (ground-water age).

- Cooperative Water Program. The Cooperative Program, a partnership between the USGS and State and local agencies, provides information that forms the foundation for many of the Nation's water-resources management and planning activities.

- Drinking Water Programs. The wide range of monitoring, assessment, and research activities conducted by the USGS to help understand and protect the quality of our drinking-water resources is described on these pages. These studies are often done in collaboration with other Federal, State, Tribal, and local agencies.

- Ground Water Atlas of the United States. The USGS series of print publications "The Ground Water Atlas of the United States" describes the location, the extent, and the geologic and hydrologic characteristics of the important aquifers of the Nation.

- Hydrologic Instrumentation Facility (HIF). Supports USGS hydrologic data collection activities through the identification of needs, development of technical specifications, design or development of specialized interfaces, contracts and procurements, testing and evaluation, specialized field applications, repair and calibration, quality control and assurance, and storage and distribution of hydrologic instrumentation.

- National Irrigation Water Quality Program. A Department of Interior program to identify and address irrigation-induced water quality and contamination problems related to Department of Interior water projects in the west.

- National Water Quality Laboratory. Fulfills analytical requirements of the USGS by analyzing environmental samples for inorganic, organic, and radiochemical constituents.

- National Water Summary. A series of publications designed to increase public understanding of the nature, geographic distribution, magnitude, and trends of the Nation's water resources. It often is referred to as the USGS "encyclopedia of water."

- National Water-Use Program. A program examining the withdrawal, use, and return flow of water on local, state, and national levels.

- Water Information Coordination Program (WICP). Purposes of the program are to ensure the availability of water information required for effective decision-making for natural resources management and environmental protection and to do it cost effectively.

U.S. Department of Agriculture

National Resource Conservation Service

The NRCS is a branch of the U. S. Department of Agriculture and has a headquarters in each state. In Alabama, the NRCS headquarters is located in Auburn. The function of NRCS at the local level is to provide technical leadership, delivery of special programs, and overall leadership of each office. Federal cost sharing typically flows through a sister agency called the Farm Services Agency, but any payments to landowners is contingent upon certification by NRCS that practices for which payments are made meet NRCS standards and specifications. The NRCS provides a District Conservationist (DC) to nearly all of the State's 67 SWCDs in Alabama and in most cases also provides at least one technician. The DC and technician work under the direction of a local, five-member District Board of Supervisors, each of whom is a local landowner.

USDA Rural Development

Rural Utilities Service

The USDA-Rural Development Rural Utilities Service (RUS) makes low interest loans combined with grants to public bodies or non profit organizations to provide water and sewer service to citizens in rural areas improving the quality of life and promoting economic development in rural America. Rural is defined as an incorporated town with a population of 10,000 or less or non-urbanized areas that are unincorporated. The program is administered by field offices of the USDA's Rural Development mission area.

The public body or non profit organization must be legally incorporated and will be required to provide evidence that they have the ability to operate the system once it is constructed. An environmental assessment is required as part of the application package and is prepared by an engineer who is selected by the applicant. This engineer also designs the project and the engineering report that is prepared is the basis for the project.

The following programs, affecting water and water quality, are a part of the RUS Water and Waste Water Disposal Program:

- h Water and Waste Disposal Direct and Guaranteed Loans. Direct loans may be made to develop water and wastewater systems, including solid waste disposal and storm drainage, in rural areas and to cities and towns with a population of 10,000 or less. Priority is given to public entities, in areas with less than 5,500 residents, to restore deteriorating water supplies, or improve, enlarge, or modify a water facility or an inadequate water facility. Also, preference is given to requests which involve the merging of small facilities and those serving low-income communities. Applicants must be unable to obtain funds from other sources at reasonable rates and terms.

- Water and Waste Disposal Grants. The purpose of the Water and Waste Disposal Grant is to reduce water and waste disposal costs to a reasonable level for users of the system.

- Technical Assistance and Training Grants. The RUS makes grants to nonprofit organizations to provide technical assistance and/or training to associations located in rural areas and to cities and towns with a population of 10,000 or less. Assistance may be provided to identify and evaluate solutions to water and waste disposal problems, to improve the operation and maintenance of existing water and waste disposal facilities, and to assist associations in preparing applications for water and waste disposal facilities.

State Programs

Alabama Department of Environmental Management

Office of Education & Outreach
In 1996, ADEM created the Office of Education & Outreach and combined a number of non-regulatory functions. Through the Office of Education & Outreach, ADEM provides speakers for civic clubs, professional groups or other organizations and educational materials for the general public, businesses, teachers and students.

ADEM's Pollution Prevention Unit
ADEM's Pollution Prevention Unit provides assistance on recycling and pollution prevention and facilitates the Waste Reduction & Technology Transfer program. The Nonpoint Source Unit provides assistance on controlling nonpoint source pollution to the agricultural, silviculture, construction, mining and urban communities through education and funding for demonstration projects.

Alabama Nonpoint Source Management Program
The Alabama Nonpoint Source Management Program promotes a cooperative partnership between federal and state agencies, environmentalists, academia, and citizen volunteers to implement voluntary management measures. These partnerships resolve nonpoint source

problems affecting Alabama as for example has been demonstrated in the development and implementation of the AFO/CAFO Rule-by-Registration. Federal (USDA) and state cost-share (ARCP) programs provide assistance to landowners for practices that reduce erosion and sedimentation, improve water quality, and enhance wetlands and wildlife habitats.

Educational outreach, technology transfer and technical assistance are provided by academia (land-grant universities), NRCS, ASWCC, RC&Ds, ACES, TVA, District Conservationists and ADEM. The Alabama Erosion Control Task Force Citizen (AECTF) addresses erosion and sedimentation through the development of an Erosion Control Guidance Manual, and the Alabama Septage Task Force addresses failing septage and alternative systems through demonstrations and state septage disposal rules and installer certification requirements. Citizen volunteers provide water quality data through Alabama Water Watch and environmental and conservation organizations such as LEAF, Wildlaw, AWWA Citizen Advisory Committee, Alabama Environmental Council, Alabama Rivers Alliance, Alabama League of Environmental Action Voters, Black Warrior River Keeper, and Sierra Club report and inquire about environmental threats and problems.

Brownfields Assessment and Remediation Program

The Environmental Assessment Section of ADEM's Land Division is involved in many aspects of brownfields assessment and remediation across the state. ADEM has been involved in each of the six Brownfield Pilot Projects in the state that were competitively awarded funding by the Environmental Protection Agency. These Pilot projects include Anniston, Montgomery, North Birmingham, Prichard, Selma, and Uniontown. These assessments provide necessary information to these communities so that these properties may potentially be redeveloped.

ADEM also has considerable experience in the assessment of "targeted" brownfield sites. A Targeted Brownfield Assessment (TBA) differs somewhat from the Pilot Brownfield Assessment in that the Department receives funding to conduct assessments directly from EPA, whereas piloted funds are awarded directly to communities or municipalities. Targeted assessments have been conducted in Sylacauga, Tallassee, Birmingham, Alabaster, Triana, Ridgeville, Prichard, Huntsville, and Tarrant. Other sites for targeted assessments are currently in the planning phase.

With the passage of the Small Business Liability Relief and Brownfields Revitalization Act, more commonly known as the Brownfields law, funds were made available to the Environmental Protection Agency for competitive grant awards for assessments, cleanups of Brownfield sites, and Revolving Loan grants. These grants are available to communities and other local entities. Section 128 (a) of this law required additional funds to be made available to only states and tribes for the establishment and enhancement of State brownfield programs, including brownfield inventory, public record, and assessment activities.

Alabama Clean Water and Drinking Water State Revolving Fund Programs

The Clean Water State Revolving Fund (CWSRF) and the Drinking Water State Revolving Fund (DWSRF) are low interest loans intended to finance public infrastructure improvements in Alabama. The programs are funded in part with the proceeds of tax-exempt bonds issued by the Alabama Water Pollution Control Authority and the Alabama Drinking Water Authority. Both authorities are composed of the Governor, the Lieutenant Governor, Speaker of the House, Finance Director, and the Director of the Alabama Department of Environmental Management (ADEM.)

ADEM administers the CWSRF and DWSRF, performs the required technical and environmental reviews of projects, and disburses funds to recipients. Projects that strengthen compliance with Federal and State regulations and/or enhance protection of public health are eligible for consideration to receive a SRF loan. If a project qualifies, the engineering, inspection, and construction costs are eligible for reimbursement. Drinking water projects that are primarily intended for future growth are not eligible. Among the projects which qualify for funding are:

- Publicly owned water or wastewater treatment facilities
- Sewer rehabilitation
- Interceptors, collectors, and pumping stations
- Drinking water storage facilities
- New/rehabilitated water source wells
- Water transmission/distribution mains

Drinking Water Branch

The Safe Drinking Water Act (SDWA) *(See Section 8: Existing Programs and Mechanisms - Safe Water Drinking Act)* Amendments of 1996 include a provision requiring states to provide an annual report on public water system violations of national drinking water regulations to EPA, and to make a copy of the report available to the public. The 2000 report includes violation data covering January – December 2000.

EPA established the Public Water System Supervision (PWSS) Program under the authority of the 1974 Safe Drinking Water Act (SDWA). Under the SDWA and the 1986 Amendments, EPA set national limits on contaminant levels to ensure safe drinking water. These limits are defined as Maximum Contaminant Levels or MCLs. Instead of an MCL for some contaminants, treatment techniques are established to control these levels in drinking water. A public water system is required to monitor and verify that contaminant levels in the water do not exceed the MCLs. If a system fails to have the water tested as required, a monitoring violation occurs. A monitoring violation also includes failing to report test results correctly or using a laboratory to perform the water analysis that is not certified. Water systems must monitor for contaminants and report results on a timetable established by EPA and ADEM. Generally, the larger the population served by a water system, the more frequent the monitoring requirements.

ADEM requires water systems to notify customers by newspaper, public posting or direct mail when MCLs are exceeded or monitoring is not conducted properly. The 1996 Amendments require public notification to include a clear and understandable explanation of the nature of the violation, potential adverse health effects, steps taken by the water system to correct the violation, and possible availability of alternative water sources for use during the violation. In addition, EPA and ADEM require water systems to monitor for unregulated contaminants to provide data as a basis for future regulatory development.

All water systems are required to monitor for various contaminants. Community and non-transient non-community water systems are required to monitor at various frequencies for volatile organic chemicals, synthetic organic chemicals, and bacteriological, inorganic, and radiological contaminants. More than 80 contaminants are regulated. These samples must be analyzed at laboratories that are certified by ADEM. The frequency of monitoring for chemical contaminants is dependent on the type of contaminant and the level at which it has been detected. Bacteriological monitoring is required monthly with the number of samples dependent on the population served. Chemical monitoring can be very expensive costing as much as $6,000 dollars per year for each sampling point. Transient non-community water systems are required to monitor monthly for bacteriological contaminants and annually for nitrates. ADEM must submit violation data to EPA on a quarterly basis. This data includes PWS inventory information, enforcement actions taken against violators, exceedance of maximum contaminant levels, monitoring, and treatment technique violations. The annual compliance report that states are required to submit to EPA will provide the total number of violations for four categories. The four categories are MCL violations, treatment technique violations, variances and exemptions, and significant monitoring violations.

Alabama Water Pollution Control Authority
The Alabama Water Pollution Control Authority, created by legislative act, provides aid to public bodies such as counties, cities, and state agencies in financing wastewater treatment facilities. The Authority established a revolving loan fund that provides low-interest loans to cities in need of new or improved sewage treatment systems.

Alabama Department of Industrial Relations

Mining and Reclamation Division
Coal operators are required to reclaim their sites when mining is completed. But it has not always been this way. Prior to passage of the federal Surface Mining Control and Reclamation Act of 1977, which set detailed mining and reclamation standards for coal operators, many mines were simply abandoned, leaving behind thousands of acres of scarred and useless land harboring public safety hazards and environmental problems. Fortunately, the Act also established a reclamation fund to finance restoration of land that had been mined and abandoned prior to 1977 and, consequently, had no responsibility for reclamation associated with it.

Administered in Alabama by the Department of Industrial Relations, the Abandoned Mine Land (AML) Reclamation Program is funded through fees paid to the federal government by today's coal operators at a rate of 35 cents per ton (surface mining) and 15 cents per ton (underground mining). That money is returned to the State, in the form of federal grants from the U.S. Department of the Interior, Office of Surface Mining, to correct problems at old mines such as improperly filled shafts, dilapidated mine buildings and equipment, toxic mine refuse, acid mine drainage, landslides, mine fires, highwalls, gas leaks and subsidence.

Lands that have been mined or affected by mining processes are eligible for treatment under the AML Program if they have been left in an inadequate reclamation status and they were mined prior to August 3, 1977; or meet certain criteria when mined after that date. Some of the above problems can occur suddenly and may be life-threatening. In those instances, the Department of Industrial Relations AML Emergency Program is capable of responding within 24 hours.

The law requires that sites be reclaimed in a specific sequence. Preference is given to projects which are for the protection of public health, safety, general welfare and property from extreme danger resulting from past mining practices. Second priority is for projects which protect public health, safety, general welfare and property from extreme danger resulting from past mining practices. Third priority is for projects which are designed to restore environmental values and conserve soil, water, woodland, fish and wildlife, and agricultural productivity.

Alabama Department of Economic and Community Affairs

Office of Water Resources

The Office of Water Resources administers programs for river basin management, river assessment, water supply assistance, water conservation, and water resources development. Further, OWR serves as the State liaison with federal agencies on major water resources related projects and conducts any special studies on instream flow needs as well as administering environmental education and outreach programs to increase awareness of Alabama's water resources.

Science Technology and Energy Division - Project R.O.S.E.

University of Alabama Research Professor Gary C. April founded Project R.O.S.E. (Recycled Oil Saves Energy) in 1977, a non-profit energy conservation program. The Alabama Department of Economic and Community Affairs Science Technology and Energy Division provides program funding. Project R.O.S.E. strives to conserve energy and preserve a valuable natural resource while protecting Alabama's environment. To accomplish its purposes, the program conducts continuous public education projects, helps establish community oil collection/recycling systems, and coordinates used oil collection and recycling statewide. Project R.O.S.E. focuses on the do-it-yourselfers (DIY) oil changer's relationship to used oil pollution prevention.

The Project R.O.S.E. network collects 8 million gallons of used oil annually. More than 500 service stations, auto part stores, car dealerships, and quick lube facilities throughout Alabama voluntarily serve as collection sites, offering DIYs a responsible alternative to improper oil disposal practices (i.e., dumping in backyards, sewers or storm drains).

In addition to its collection site program, Project R.O.S.E. serves rural municipalities (areas without suitable collection sites) with 55-gallon drum placement/collection methods and establishes curbside used oil collection programs in metropolitan areas. During the program's history, these various collection methods have saved some one-half billion gallons of oil from polluting Alabama's soil and waterways. The program has also expanded its scope, adapting used oil collection and recycling systems to on-site corporate and marine management applications.

Marina R.O.S.E. evolved as an on-site measure to control the discharge of boat motor oil around recreational waterways (improperly maintained engines and irresponsible owner behavior remain at the core of its pollution problem). Collection sites, typically established at marinas and vessel service facilities, encourage proper boat motor upkeep and remind owners of their water management responsibilities.

Project R.O.S.E's comprehensive approach to used oil recycling has received national recognition. The United States Environmental Protection Agency based its "How to Set Up A Local Program to Recycle Used Oil" booklet on the Project R.O.S.E. model, calling the program "one of the country's most successful organized promoters."

Alabama Forestry Commission (AFC)

Established as a state agency in 1924, the mission of the Alabama Forestry Commission is three-fold: to Protect the Forests from all harmful agents; to Service and Help Landowners to carry out responsible forest management on their property, using professional technical assistance so as to benefit themselves, their land and society; and to Educate the General Public about the value of forests in insuring both a healthy economy and environment.

In continued efforts to promote the use of Best Management Practices (BMPs) for Forestry to protect and improve water quality, the AFC updated and reprinted Alabama's Best Management Practices for Forestry guideline book. More than 1,200 copies have been distributed to loggers, forest industries, private landowners, universities, and other interested groups. Educational programs and tours have been held to highlight the benefits of using BMPs by landowners, loggers, foresters, and others when conducting forest management activities.

The AFC has also worked with the Alabama Department of Environmental Management (ADEM) to address water quality complaints associated with forestry operations. Commission personnel respond to water quality complaints received by ADEM, Alabama Forestry Initiative Line (1-800-206-0981), and the public, where forestry operations are cited as a potential cause. When responding, AFC personnel notify the appropriate landowner and seek permission to visit the site and determine if a forestry practice is involved and if BMPs were properly used during the operation. The majority of complaint cases are resolved through educational efforts.

Additionally, the AFC conducts random checks of forestry activities and evaluates the implementation of BMPs. If BMPs are not followed, Commission personnel with the landowner, timber harvesters, and timber buyers to educate them on the proper use and benefits of BMPs and outline specific, voluntary measures that can be used to successfully resolve problems associated with the operation in question.

To assist landowners in managing their property, the Forestry Commission helps administer cost-share programs. An example is the Alabama Agricultural and Conservation Development Commission Program, which provides cost-sharing for practices aimed at erosion control, agricultural water quality improvement, and improving forest resources. This is one of several programs, which may partially reimburse landowners who plant trees or do timber stand improvements.

As a member of the Alabama Forestry Planning Committee, the AFC supports the TREASURE forest program including conducting week long TREASURE Forest training sessions for its employees. These workshops are designed to educate AFC employees on the TREASURE Forest program. Specific water quality objectives of the TREASURE Forest program include:

- Reduction of erosion by following Best Management Practices
- Soil and water protection education/demonstration
- Litter control
- Reduction of environmental impact of recreational activities
- Maintaining native species for biodiversity and habitat

Local Watershed Management Resources

Soil & Water Conservation Districts

The local Soil and Water Conservation Districts, which are entities of State government, and the Natural Resources Conservation Service (NRCS), a Federal agency, have been "joined at the hip" since 1937. In that year, Congress established the Soil Conservation Service (SCS) and mandated that this new agency would work directly with local Soil Conservation Districts to protect the resource base on farms and ranches throughout the Nation. The old SCS has since become the Natural Resources Conservation Service (NRCS) and most Soil Conservation Districts have included "water" in their names. The NRCS is a branch of the U. S. Department of Agriculture and has a headquarters in each state. In Alabama, the NRCS headquarters is located in Auburn. The function of NRCS at the local level is to provide technical leadership, delivery of special programs, and overall leadership of each office. Federal cost sharing typically flows through a sister agency called the Farm Services Agency, but any payments to landowners is contingent upon certification by NRCS that practices for which payments are made meet NRCS standards and specifications. The NRCS provides a District Conservationist (DC) to nearly all of the State's 67 SWCDs in Alabama and in most cases also provides at least one technician. The DC and technician work under the direction of a local, five-member District Board of Supervisors, each of whom is a local landowner.

The Soil & Water Conservation District Board provides direction for local programs and ensures that the District staff fulfill its primary mission of working with landowners to install Best Management Practices (BMPs) to control erosion, protect water quality, and provide other measures necessary to enhance and protect the environment. Both the DC and technician may also gather data to assess resource needs, provide educational programs, conduct tours, and develop other activities in support of the overall resource conservation effort. Each SWCD also has a District Administrative Coordinator (DAC) who is a local (non-Federal, non-state) worker who provides administrative support for the office. In many cases, the DAC takes a lead role in organizing meetings, providing educational programs to schools, and providing special assistance to the DC and the Board.

The State Soil and Water Conservation Committee (SWCC) is the "mother organization" for the 67 SWCDs and is responsible for providing overall administrative leadership to the Districts. The SWCC consists of six District Board members selected from six administrative areas of the state plus representatives from Auburn University's Agricultural Experiment Station, Alabama Cooperative Extension System, and Alabama Business Education. The SWCC meets quarterly while routine day-to-day operations are run by an Executive Director and staff of four.

A contract employee handles the grants program and activities related to CAFO registration. The SWCC is responsible for administering the state cost share program, which, in the year 2001, provided more than $2 million to local SWCDs. In addition, the SWCC administers a number of EPA and ADEM grants to Districts, which totaled more than $1 million in 2001. Additionally, the Soil & Water Conservation districts are responsible for conducting a statewide nonpoint source watershed assessment in cooperation with the NRCS.

Local Soil & Water Conservation Districts provide a wide variety of educational programs and outreach material. A partial list of educational programs for schools are shown below:

- FAWN (Forestry Awareness Week Now) - Targets 6th grade. Coordinated by the local Forestry Planning Committee in which the SWCD plays the leading role. Involves a "day in the woods" for very comprehensive training in forestry and related disciplines, including water quality.

- Tracks - Targets grades 1-4). An in-classroom program that features animal identification and habitat issues, including forestry.

- Water Festivals - Targets 4th grade. A new program originated by ADEM that involves a field trip to a local college campus for training in water quality in a fun and interactive environment. Goals are for every county in Alabama to hold a yearly event.

- Enviroscape Model - Targets grades 5-6. The enviroscape model uses a large landscape model to teach about point and non-point source pollution.

- Life in a Fishbowl - Targets Headstart to 2nd or 3rd grade. It uses a goldfish bowl with a plastic fish to dramatize the effects of point and non-point source pollution from a fish's point of view.

Alabama Conservation Partnership

The Alabama Conservation Partnership is made up of the Alabama Association of Conservation Districts, Alabama Soil & Water Conservation Committee, Alabama Association of Resource Conservation & Development Councils, and the USDA Natural

Resources Conservation Service. Their mission is to provide service, leadership, and assistance to all citizens for the wise use, conservation, and development of Alabama's natural resources.

Alabama Cooperative Extension System

In 1862, Congress passed a law granting land to each state for "agricultural and mechanical" institutions of higher learning. In 1890, Congress granted land to institutions educating Black citizens. In the late 1800s, the school that is now Tuskegee University began using a mule-drawn wagon as a "school on wheels" to teach rural people better ways to grow crops and feed their families.

The land-grant mission and teaching outside the classroom gave rise in 1914 to the national Cooperative Extension Service, whose mission was to "take the university to the people." Alabama is the first state to combine the Extension programs at its 1862 and 1890 land-grant universities. In 1995, the Alabama Cooperative Extension System was formally created, including Alabama A&M University and Auburn University, with Tuskegee University cooperating.

Over the years, Extension's knowledge base and capacity have expanded through partnerships with hundreds of organizations-all the way from local to international groups. Through the work of more than 500 Extension agents and other field-based staff, in addition to specialists in many facets of our six program areas, the Alabama Cooperative Extension System is bringing the research and knowledge of the land-grant universities and the Alabama Agricultural Experiment Station, and the expertise of our many partners, to the people. More information about the Alabama Cooperative Extension System and their programs is available on their website at www.aces.edu.

Regional Planning Commissions

Regional planning is provided in large measure, through the Regional Councils through the State. Regional Councils are authorized to undertake comprehensive regional planning and to assist counties and local governments in their planning. Regional Councils have no regulatory authority. The influence of the Regional Councils is primarily through consensus building, infrastructure planning and funding, resource allocation, grants and funding, and in assisting local governments when assistance is requested.

Industry and Organizational Resources and Programs

Alabama Power

Renew our Rivers

Alabama's rivers are cleaner thanks to Alabama Power's award-winning Renew the Coosa river cleanup program. The program began in May 2000, after employees from Alabama Power's Plant Gadsden became concerned about litter in and on the banks of the Coosa

River. Renew Our Rivers is the Southeast's largest organized river-system cleanup and one of the largest of its kind in the nation.

Nature's Treatment

Wetlands can provide an environmentally friendly wastewater treatment option. Alabama Power is testing a three-acre, man-made wetlands area at Plant Gorgas to manage water run-off.

Aquatic Habitat Enhancement

In 1992, Alabama Power Company became the first utility in the country to sign a Memorandum of Agreement with the Bass Anglers Sportsman Society (B.A.S.S.). The agreement provides a framework for B.A.S.S. and the company to work together on cooperative projects. Both are working with the Alabama Department of Conservation to implement a habitat enhancement program using discarded Christmas trees. Projects are underway on Weiss, Martin and Smith Reservoirs.

Homebuilders Association of Alabama (HBAA)

The HBA offers an erosion control course for its members. Successful completion of the course allows one to become a Qualified Credentialed Inspection Professional (QCIP). The certification is a result of a joint memorandum of agreement between ADEM and the AGCA. The QCIP becomes qualified to assist an engineer and/or professional, help install the BMP plan, and sign off, verifying the correct installation. A QCIP must inspect the entire worksite and record findings on a monthly basis. They must also inspect the site and BMPs after every rain event that measures ¾" rainfall or more in a 24-hour period of time. The QCIP is able to sign off on every inspection and is responsible for having all corrective maintenance records on site at all times. In addition to informing contractors concerning the new regulations, components of the NEMO program are also used.

Wal-Mart Stores, Inc.

The case of Wal-Mart vs. EPA was the first federal government enforcement action taken against a national company for multi-state violations of stormwater management requirements. The settlement, announced June 7, 2001, resolves Wal-Mart Stores Inc. and 10 of the store's contractors of violations of storm water requirements under the Clean Water Act's National Pollutant Discharge Elimination System (NPDES). The alleged violations occurred at 17 Wal-Mart Stores construction sites in Texas, New Mexico, Oklahoma, and Massachusetts. The settlement commits Wal-Mart to a comprehensive environmental management plan to increase compliance at each of the store's construction sites nationwide through additional inspections, training, and record keeping. It is expected that this agreement should substantially reduce costs born by local communities and states each year to ensure the safety of their drinking water, lakes, and rivers.

Alabama Forestry Association

The Alabama Forest Products Association (AFPA) was formed on May 6, 1949 by a small group of conservation minded individuals that depend on a well-managed and healthy forest. Most of these early pioneers were small, independent sawmill owners. They saw the need to promote good forest management and defend their livelihood from impending government regulation and increased competition from other states and countries.

In February 1972, the AFPA was renamed the Alabama Forestry Association (AFA) to better illustrate the diversity of its membership. Other milestones since then include establishment of ForestPAC, the AFA's official political action committee in 1980; the naming of the Alabama Pulp & Paper Council as an AFA affiliate in 1990; the founding of the Alabama Logger's Council in 1992; and the adoption of the Log a Load for Kids program in 1992 to help Alabama's ill, injured and abused children. The Alabama Forestry Association has grown substantially from its beginnings in 1949 to include a majority of the forestry industry in the State. Today, it is the host for the Sustainable Forestry Initiative program in Alabama.

Non Profit Organizations

Alabama B.A.S.S. Federation
www.albassfed.org
Mission: To promote quality water standards, fishing, conservation, and sportsmanship.

Alabama Rivers Alliance (ARA)
The Alabama Rivers Alliance was formed out of the efforts of its predecessor – the Alabama State Rivers Coalition. The Alabama State Rivers Coalition was formed in 1993 and led by the Cahaba River Society, Alabama Chapter of the Sierra Club, Lake Watch of Lake Martin, Alabama Citizen Action, Friends of the Locust Fork River, and Alabama Environmental Council.
http://www.alabamarivers.org/

www.911environment.org.
www.911environment.org is a new web page for reporting observed water pollution problems in Alabama. The web page is a joint project of the Alabama Rivers Alliance, World Wildlife Fund and Alabama Environmental Council. Problems noticed within any watershed in the State of Alabama may be reported. The Alabama Rivers Alliance will receive the information from all reports you send, and forward them to the appropriate environmental agencies and personnel as well as to other environmental and watershed groups with an interest in your area. They will then work with our sister organizations to do all we can to ensure that ADEM follows up to address any violations of water quality laws.

Alabama Water Watch
www.alabamawaterwatch.org
Alabama Water Watch (AWW) is coordinated through Auburn University's Department of Fisheries and Allied Aquacultures, and the International Center for Aquaculture and Aquatic Environments. The program is dedicated to developing citizen volunteer monitoring of Alabama's lakes, streams and coasts. The program office oversees the day-to-day operations of AWW, while program personnel provide a wide range of services to monitors, including: conduct training sessions; compile and maintain a massive collection of data on citizen volunteers, monitoring sites, and water quality data; interpret technical data gathered by

monitors; produce a variety of media; and provide online summary graphs and maps. Since the AWW Program began in 1992, nearly 225 citizen groups have become involved with water monitoring on hundreds of waterbodies. Monitors have sampled 1,400 sites on 500 waterbodies and submitted over 25,000 chemistry and 4,000 bacteriological data forms.

Alabama Wildlife Federation
www.alabamawildlife.org
The Alabama Wildlife Federation (AWF) is the oldest and largest non-profit conservation organization in Alabama. The AWF was established by sportsmen in 1935 to promote the conservation and wise use of our wildlife and natural resources and to ensure a high quality of life for future generations of Alabamians. Its mission is "To promote the conservation of Alabama's wildlife and related natural resources, as a basis for the social and economic prosperity of present and future generations, through wise use and responsible stewardship of our wildlife, forests, fish, soils, water, and air."

Coosa River Basin Clean Water Partnership
The Partnership is a coordinated effort by public and private stakeholders to develop and implement watershed management plans for the Upper, Middle and Lower Coosa River Basins. In accord with the national Clean Water Action Plan, local stakeholders (citizens, businesses, industry, and other commercial, public and private interests) are encouraged to participate. A key component of the Partnership is to bring people together from across the basin to discuss ways to utilize a watershed approach to implement watershed restoration strategies aimed at safeguarding water quality.

Resource, Conservation & Development Councils (RC&D)
Resource Conservation and Development Councils help plan and carry out activities that increase conservation of natural resources, support economic development and enhance the environment and standard of living in local communities. Established in 1960 as a pilot program by the USDA to perform a number of conservation and development activities, the program focused on geographic areas where major economic and social downturns had occurred. Today, local RC&D councils continue to serve local communities through a locally led process where volunteers work together to plan how they can actively solve environmental, economic and social problems facing their community.

Forever Wild
Forever Wild was created to help preserve Alabama's natural heritage and to increase opportunities for public outdoor recreation and education. Funding for Forever Wild is derived primarily from state royalties on offshore natural gas leases belonging to Alabama. Funding for property acquisition will be available through fiscal year 2012-2013.

The Board of Directors for the Forever Wild Land Trust has established a methodical and consistent process for tract selection. The Board endeavors to acquire the best properties available to it within reasonable purchase terms. Efforts are made to select tracts of land evenly from among the northern, central and southern districts of the state and from among four targeted land uses: Nature Preserves, General Outdoor Recreational Areas, Wildlife Management Areas (for public hunting) and extensions of existing State Parks.

Globe Program
Administered through the McWane Center, the Globe Program is a worldwide hands-on, primary and secondary school-based education and science program. For Students, GLOBE provides the opportunity to learn by:

- Taking scientifically valid measurements in the fields of atmosphere, hydrology, soils, and land cover/phenology - depending upon their local curricula
- Reporting their data through the Internet
- Creating maps and graphs on the free interactive Web site to analyze data sets
- Collaborating with scientists and other GLOBE students around the world

For Teachers, GLOBE provides assistance through:

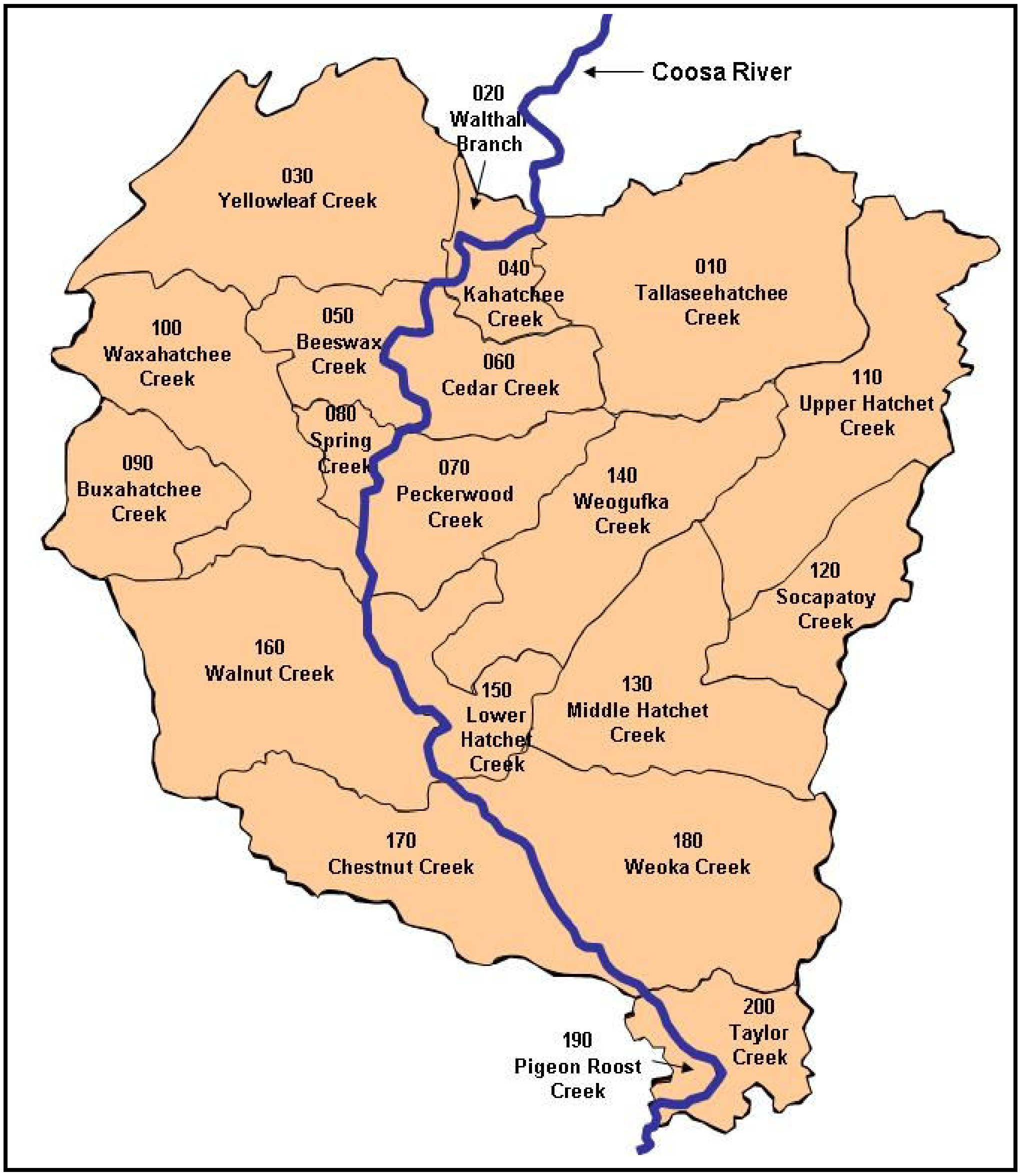
- Training at professional development workshops
- Teacher's guides, "how-to" videos, and other materials
- Continuing support from a Help Desk, scientists, and partners
- Contact with other teachers, students, and scientists worldwide.

Using Alabama Water Watch protocol, the Globe Program is actively working with school systems within the Black Warrior River Basin. Students are introduced to the issue of water quality and pollution in river systems through a hands-on scientific investigation using nine to ten different chemical, biological and physical water quality indicators. Students must use observation, questioning, analysis and synthesis skills in the process of developing research questions and testable hypotheses. Students then carry out a cooperative field research investigation of water quality in the river or stream, with number of sites, dependent upon length and focus of the program, to prove the validity of their hypotheses. Once, they have found the water quality index of their site(s), they share their findings with each other and draw conclusions and recommendations as to how to work to improve water quality.

Alabama Chapter of the Nature Conservancy (TNC)
For twelve years, the Alabama Chapter of The Nature Conservancy has acted as a champion of protection for Alabama's remarkable natural heritage. It is the only state conservation organization dedicated exclusively to protecting endangered plants and animals by protecting the lands and waters they need to survive. The Chapter accomplishes its mission using a pragmatic, non-confrontational approach, which includes planning based on scientific research and inventory and partnerships with businesses, individuals and the government. Already, the organization has protected more than 120,000 acres of Alabama's forests, swamps, marshes, seashores and mountains-home to more than a thousand rare plants and animals.

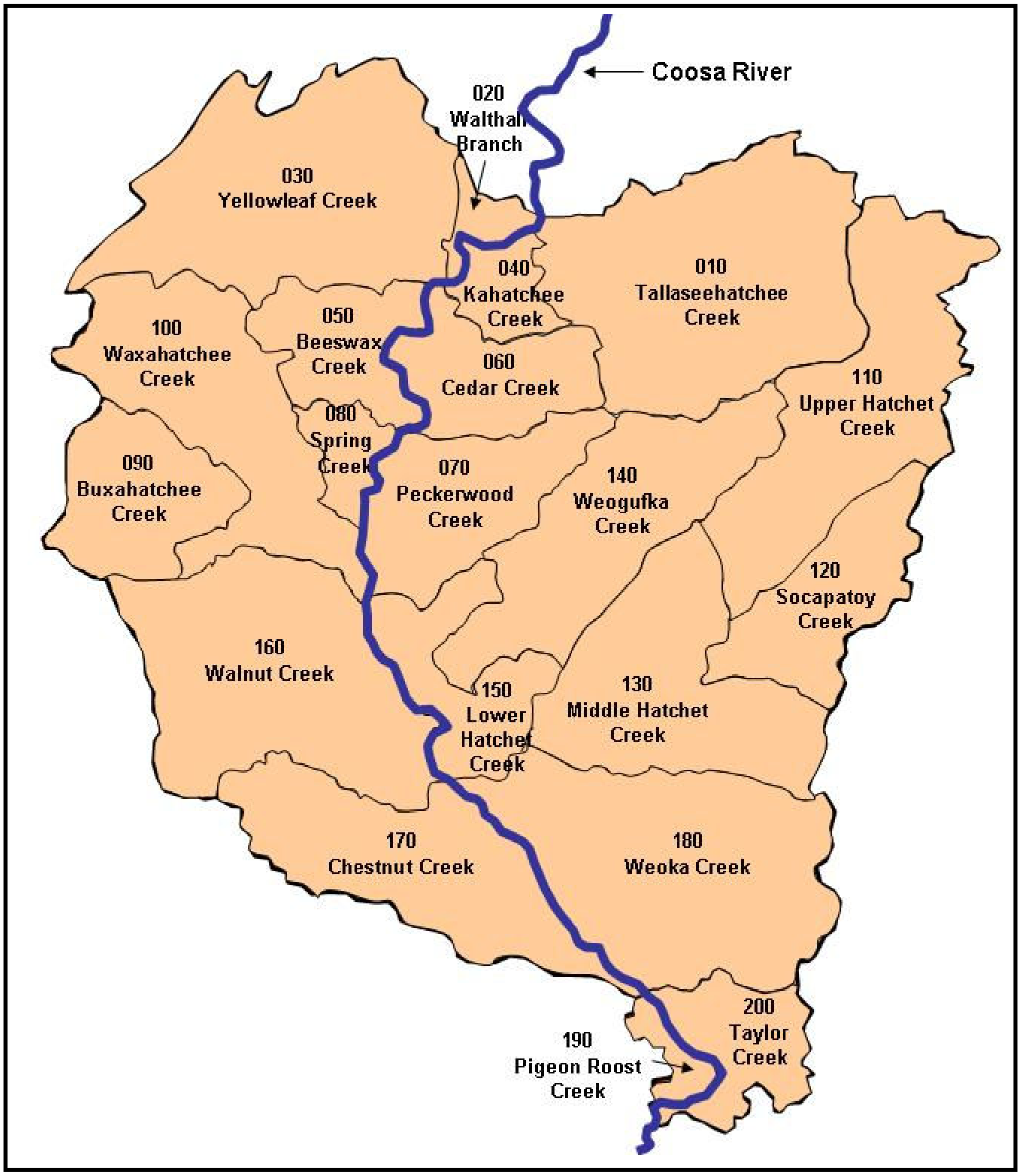
Lay Lake Home Owner and Boat Owner Association
Lake Mitchell Home Owner and Boat Owner Association
Lake Jordan Home Owner and Boat Owner Association
These associations play an active part in safeguarding the water quality of the three lakes in the Lower Coosa River Basin. Each organization has at least an annual lake cleanup program, and some have two cleanup per year. Additionally, each of the three organizations coordinates water quality monitoring efforts around their specific lake.

Atlas of Watersheds:
Lower Coosa River Basin



A Supplement to the Lower Coosa River Basin Management Plan
May 2005

Atlas of Watersheds: Lower Coosa River Basin



A Supplement to the Lower Coosa River Basin Management Plan
May 2005

The Lower Coosa River Basin Management Plan has been made possible with funds from the Alabama Clean Water Partnership through a Clean Water Act Section 319 Grant from the U.S. Environmental Protection Agency, Region IV and the Alabama Department of Environmental Management.

Special thanks are extended to the many stakeholders of the Lower Coosa River Basin for their help with this project; and, especially to Bob Grasser for his perspectives, experience and his tireless dedication well into retirement in completing the project.

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Table of Contents

Introduction

This document provides information regarding each of the 20 (11 digit HUC) watersheds located within the basin boundaries. The *Atlas of Lower Coosa River Watersheds* applies information previously presented in the *Lower Coosa River Basin Management Plan* main document in a general basin overview format specifically to each of the watersheds and provides more detail, as necessary. In this way, users of the *Plan* may research their specific watershed for information that pertains only to them rather than trying to derive it from the basinwide information. The compilation of this *Atlas* is intended to enable stakeholders to easily and efficiently identify and address issues that are pertinent to their watershed while working within the basin management framework.

Each watershed section contains a summary of the existing conditions of the watershed, which includes land use, water uses, soil analysis, identification of local endangered species, and detailed demographic information. Further, each watershed section identifies issues that are pertinent to that watershed. Basinwide and regional recommendations may be found in the main document of the *Plan* in Part IV: Water Quality Improvement Program.

Information for the *Atlas* was gathered from a variety of sources. In an effort to avoid redundancy throughout the Atlas, the sources of information for each part of the *Atlas* are provided here.

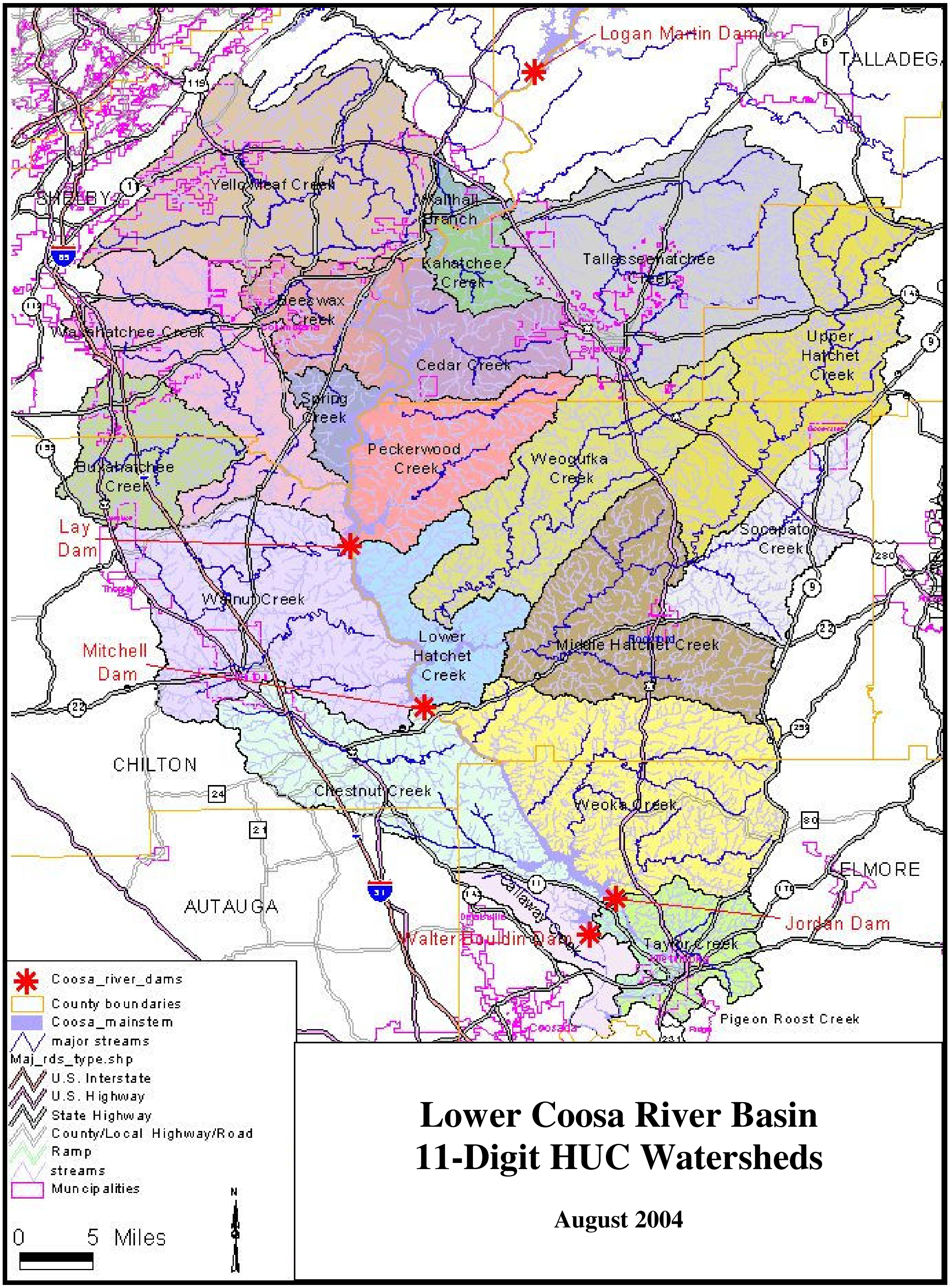
Land Use Coverage:	Alabama Department of Environmental Management geographical information system maps. The source of information for the maps was U.S. Geological Survey land satellite data from 1996.
Land Use Quantities:	Alabama Soil and Water Conservation Committee (SWCC) Coosa River Basin Assessment,1998. http://www.swcc.state.al.us
Animal Data:	Alabama Soil and Water Conservation Committee (SWCC) Coosa River Basin Assessment,1998. http://www.swcc.state.al.us
Domestic Water Data:	Alabama Soil and Water Conservation Committee (SWCC) Coosa River Basin Assessment,1998. http://www.swcc.state.al.us
Sediment Loads:	Alabama Soil and Water Conservation Committee (SWCC) Coosa River Basin Assessment,1998. http://www.swcc.state.al.us
Water Users:	Alabama Department of Environmental Management; 2003 lists of National Pollutant Discharge Elimination System (NPDES) permit holders. These lists were categorized by municipal, industrial and mining permits.

Soils:	Mobile District of the U.S. Army Corps of Engineers, *State of Alabama Environmental Data Inventory*, January 1, 1981.
Endangered Species:	Daphne Ecological Services Field Office of the U.S. Fish and Wildlife Service. *Alabama's Federally Listed Species*, January 30, 2004. www.daphne.fws.gov/es/specieslst.htm
	U.S. Fish and Wildlife, Division of Ecological Services, Panama City, Florida. *Protected Species Inventory an Identification in the Alabama-Coosa-Tallapoosa and Apalachicola-Chattahoochee-Flint River Basins, Volume I.* Jerry W. Ziewitz,, Brian K. Luprek and John W. Kasbohm. January 1997.
Demographics:	U.S. Bureau of Census, 2000, Summary Files 1 and 3 and Delaney Consultant Services, Inc.
Economics and Employment:	U.S. Bureau of Census, 2000, Summary Files 1 and 3 and Delaney Consultant Services, Inc.
Housing:	U.S. Bureau of Census, 2000, Summary Files 1 and 3 and Delaney Consultant Services, Inc.

Lower Coosa River Watershed Composite

All of the watersheds in the Lower Coosa River basin have the same first eight digits for their hydrologic unit code (HUC): **03150107**. The three digit code listed below is the identifying portion of the full 11-digit HUC for each watershed within the Lower Coosa River basin.

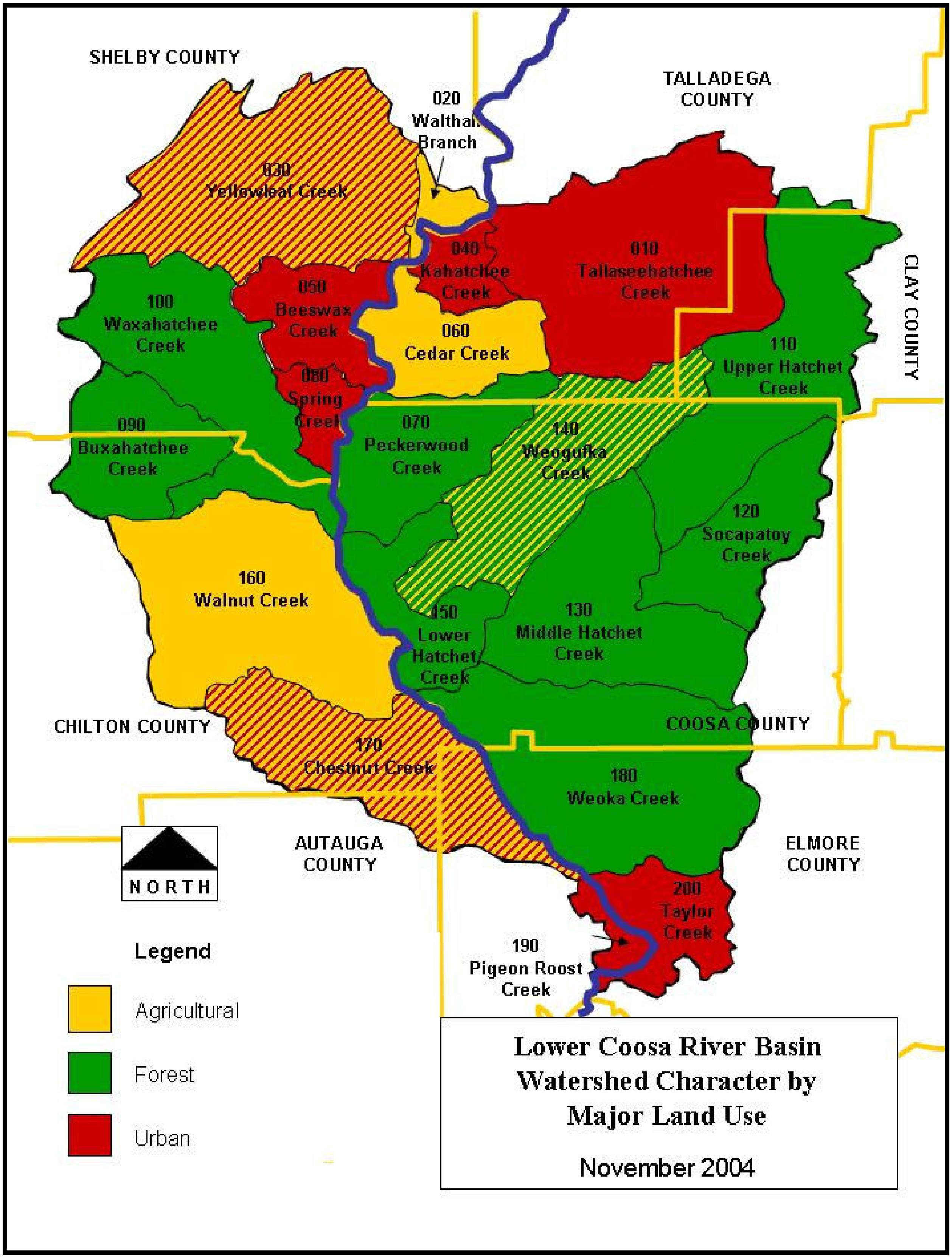
HUC	Watershed Name	Size (acres)	Percent of Basin	Total 2000 Population	Percent of Basin
010	Tallaseehatchee Creek	128,147	10.25%	27,086	24.69%
020	Walthall Branch	8,611	.69%	798	.73%
030	Yellowleaf Creek	118,484	9.47%	12,041	10.98%
040	Kahatchee Creek	15,836	1.27%	2,704	2.46%
050	Beeswax Creek	36,371	2.91%	5,043	4.60%
060	Cedar Creek	41,594	3.33%	3,234	2.95%
070	Peckerwood Creek	53,130	4.25%	881	.80%
080	Spring Creek	14,511	1.16%	1,911	1.74%
090	Buxahatchee Creek	44,551	3.56%	4,118	3.75%
100	Waxahatchee Creek	87,372	6.99%	6,009	5.48%
110	Upper Hatchet Creek	96,450	7.71%	3,021	2.75%
120	Socapatoy Creek	48,708	3.89%	1,656	1.51%
130	Middle Hatchet Creek	84,188	6.73%	1,445	1.32%
140	Weogufka Creek	78,757	6.30%	3,937	3.59%
150	Lower Hatchet Creek	38,844	3.11%	410	.37%
160	Walnut Creek	112,675	9.01%	11,114	10.13%
170	Chestnut Creek	80,961	6.47%	9,825	8.96%
180	Weoka Creek	121,204	9.69%	6,110	5.57%
190	Pigeon Roost Creek	11,288	.90%	2,896	2.64%
200	Taylor Creek	28,913	2.31%	5,471	4.99%



Lower Coosa River Basin
11-Digit HUC Watersheds

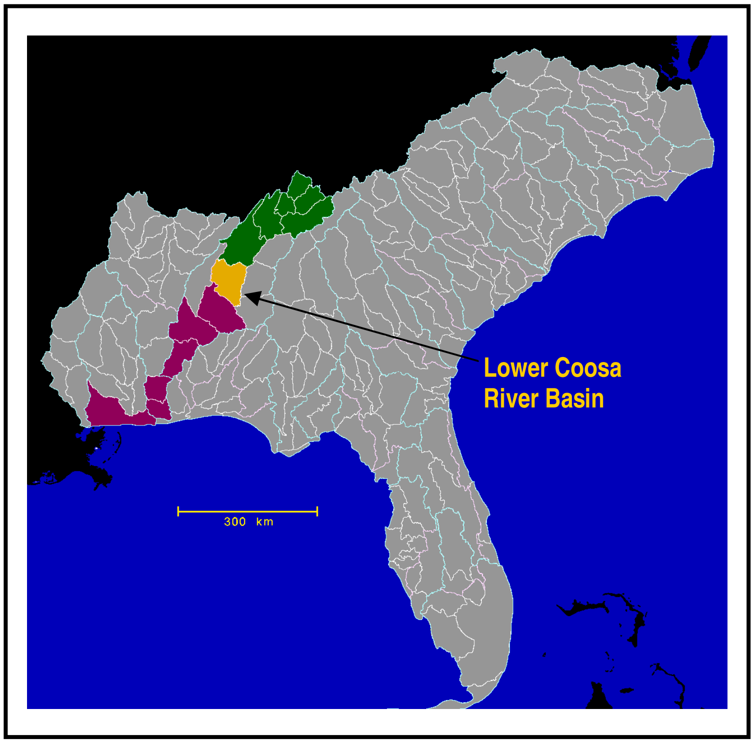
August 2004

Source: Alabama Department of Environmental Management. August 2004.


SHELBY COUNTY
TALLADEGA COUNTY
CLAY COUNTY
CHILTON COUNTY
COOSA COUNTY
AUTAUGA COUNTY
ELMORE COUNTY
020 Waltham Branch
030 Yellowleaf Creek
040 Kahatchee Creek
010 Tallaseehatchee Creek
050 Beeswax Creek
060 Cedar Creek
100 Waxahatchee Creek
080 Spring Creek
110 Upper Hatchet Creek
090 Buxahatchee Creek
070 Peckerwood Creek
140 Weogufka Creek
120 Socapatoy Creek
160 Walnut Creek
150 Lower Hatchet Creek
130 Middle Hatchet Creek
170 Chestnut Creek
180 Weoka Creek
200 Taylor Creek
190 Pigeon Roost Creek
NORTH
Legend
Agricultural
Forest
Urban
Lower Coosa River Basin Watershed Character by Major Land Use
November 2004

Lower Coosa River Basin
HUC: 03150107

Watershed Area:	1,250,595 ac.
Counties:	Autauga, Chilton, Clay, Coosa, Elmore, Shelby, Talladega
Municipalities:	Calera, Chelsea, Childersburg, Clanton, Columbiana, Goodwater, Harpersville, Jemison, Pelham, Rockford, Sylacauga, Thorsby, Wetumpka, Wilsonville
Total Population:	109,710
Land Use	
Lakes and Ponds	23,511 ac
Cropland	34,437 ac
Pastureland	129,884 ac
Forestland	977,965 ac
Urbanized	61,632 ac
Mined Land	6,378 ac
Other Land	16,788 ac
Animal Data	
Cattle	31,535
Dairy	259
Swine	731
Broilers	0
Layers	0
Catfish Acres	2,154
Domestic Water Data	
Septic Tanks	16,220
Failing Septic Tanks	998
Alternative Systems	200
Sediment Loads (in tons)	
Total	5,349,657
Cropland	109,117
Sand & Gravel Pits	345,800
Mined Land	259,008
Developing Urban Land	2,666,080
Gullies	230,650
Critical Areas	501,225
Streambanks	360,403
Dirt Roads and Banks	366,599
Woodland	510,775
Water Users	
Public Water Supply	6
Total Permitted Dischargers	42
Municipal	5
Industrial	33
Mining	4



Source: Montana State University Environmental Statistics Group, Graphical Locator. www.esg.montana.edu

Impaired Water Bodies .... Buxahatchee Creek
Lake Mitchell, Lay Lake
Unnamed Tributary to Dry Branch

Active Water Quality Monitoring Sites 23

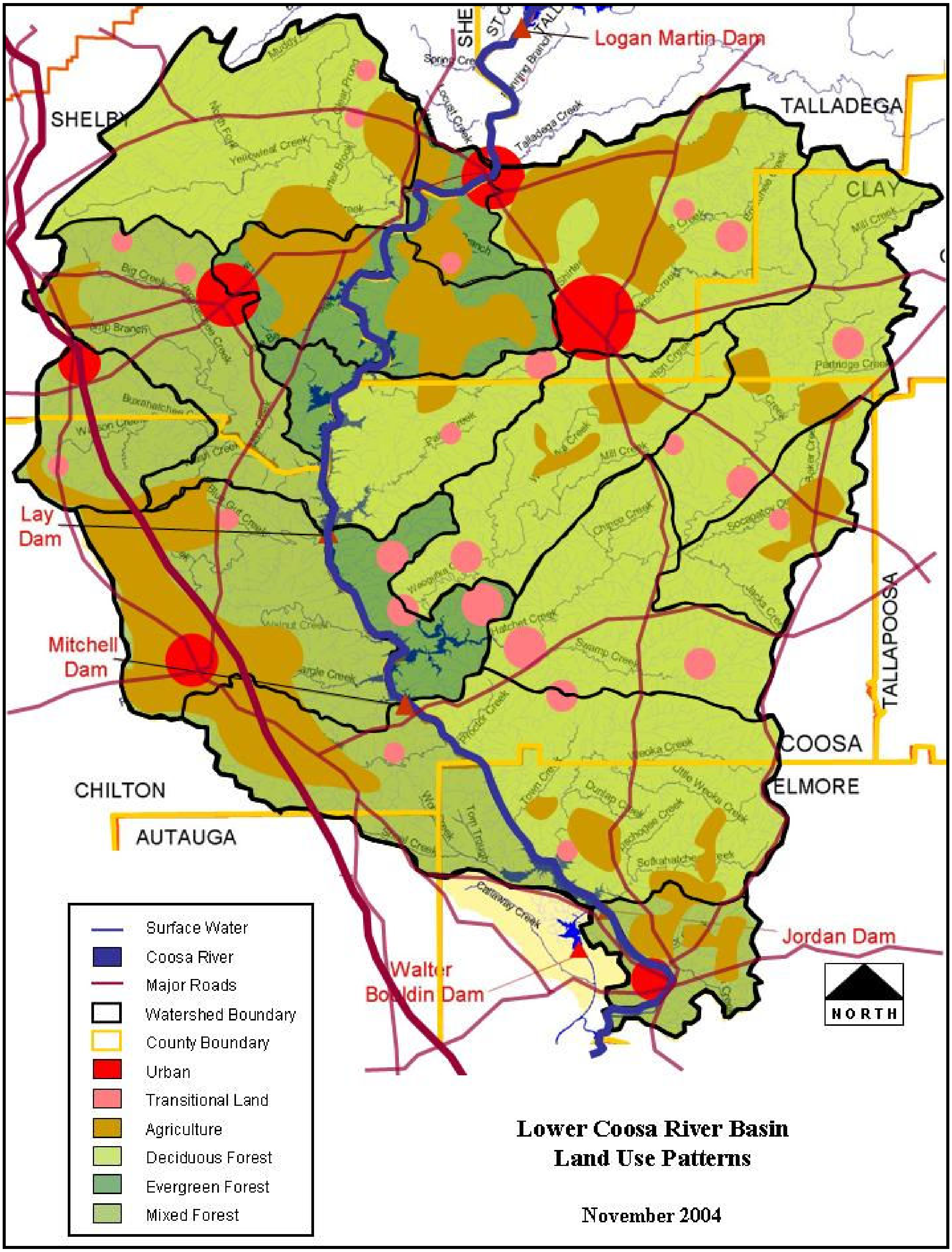
Overall Suitability for Development .... Moderate

Issues within much of the Lower Coosa River Basin center around the impacts of moderate to extreme growth, development and urbanization of previously rural areas. In addition to urbanization issues, the Basin faces sedimentation issues from improperly managed agricultural and silvicultural lands, problems with illegal dumping and a lack of widespread awareness regarding the cumulative effect of individual actions on water quality. Further, the Lower Coosa River Basin is home to numerous endangered species, including five of the 22 species included in the Recovery Plan for the Mobile River Basin Aquatic Ecosystem.

Basin Land Use Patterns

Two sources of data were used to obtain land use information: the Alabama Soil and Water Conservation Districts (SWCD) and Alabama Department of Environmental Management (ADEM). Land use coverage is shown in Figure 73 and discussed in Chapter 5 of the main document of the *Plan*. The illustration on the following page shows generalized land use patterns which provide a clearer picture of the types of land use in the various parts of the basin. As is evident from the illustration, the majority of the land in the basin is used for forestry and timber purposes or is undeveloped woodland. All of these uses are categorized as forest land. Deciduous forests are generally natural forests, such as the Talladega National Forest. Concentrations of deciduous forest generally occupy the northern and eastern portions of the basin. Concentrations of evergreen forests are located in the central part of the basin around the Coosa River. And, mixed forests are found in the southwestern and southern portions of the basin. Evergreen and mixed forest are the types of woodlands that are most used for silviculture. The generalized land use patterns also show that the majority of the agricultural activity is located in the north central, western and southern portions of the basin, while the eastern part of the basin has only small-scale and sporadic agricultural land uses. Urban land uses are primarily located in the northern and western parts of the basin in incorporated municipalities, following the major transportation system. Transitional lands, however, are more heavily concentrated in the eastern portion of the basin and tend to be located along the lakes and larger streams.

A comparison of the land use patterns and the soil association maps shows a direct correlation between the existing development and the soil composition of the basin. Soils in the northern, eastern and southern parts of the basin have slight to moderate limitations to development and this is where the majority of the urban land uses are found. Soils in the eastern part of the basin, however, have moderate to severe restrictions to development, which is where the concentrations of deciduous forest are located.


Logan Martin Dam
SHELBY
TALLADEGA
CLAY
Lay Dam
Mitchell Dam
TALLAPOOSA
COOSA
ELMORE
CHILTON
AUTAUGA
Jordan Dam
Walter Bouldin Dam
NORTH
Surface Water
Coosa River
Major Roads
Watershed Boundary
County Boundary
Urban
Transitional Land
Agriculture
Deciduous Forest
Evergreen Forest
Mixed Forest
Lower Coosa River Basin
Land Use Patterns
November 2004

Basin Soil Associations

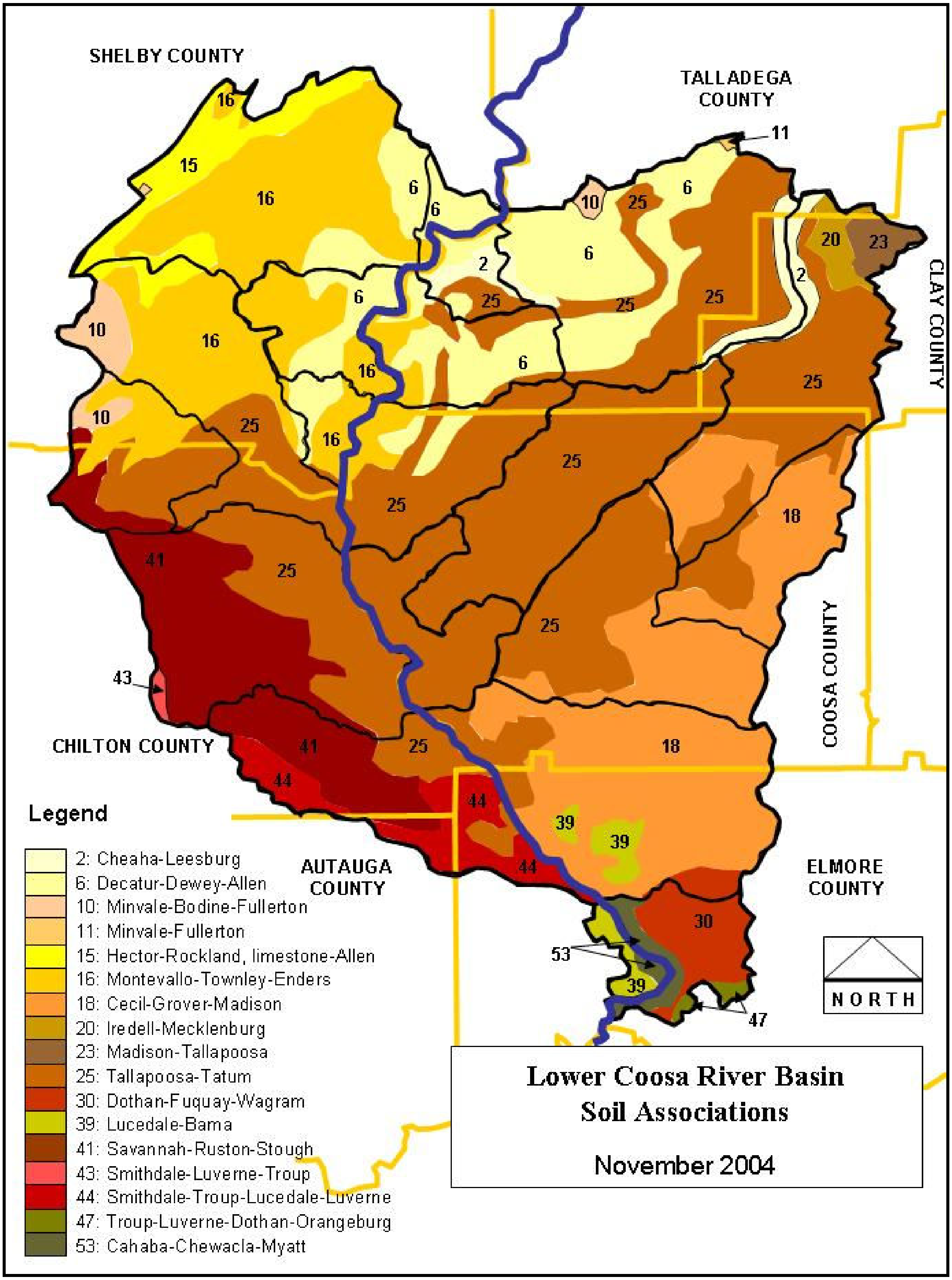
The Lower Coosa River Basin is comprised of soils from 17 different soil associations, as defined by the former Soil Conservation Service, now known as the Natural Resource and Conservation Service. Soil composition is a major factor in past development patterns and future development decisions because of the related costs of construction due to the underlying soils, or what type of vegetative growth the underlying soils will sustain. Therefore, this discussion is focused on the suitability of the soils for supporting vegetative growth and limitations for structural development from a general basin-wide perspective. More detailed information regarding soil suitability and limitations is found in the soil section for each watershed.

Of the 17 soil associations found in the Lower Coosa River Basin, there are eight predominant associations that cover the majority of the land in the basin, with varying degrees of suitability for crops, pasture and woodlands as well as varying degrees of limitations for structural development. Overall, the best soils that can sustain crops, pasture and woodlands and have properties that support structural development with minimal corrections actions are found in the north central part of the basin, in eastern Shelby County and western Talladega County, and in the southern part of the basin, in the vicinity of Wetumpka in Elmore County.

The northwestern part of the basin, in the south central part of Shelby County, is comprised of soils in the Montevallo-Townley-Enders Soil Association. Due to steep slopes, ranging from 6 to 40 percent, drought characteristics and shallow depth of rock, soils in this association have poor suitability for sustaining crops, pasture or woodlands. Furthermore, the severe slopes and shallow depth to rock properties of this association presents severe limitations to structural development including recreational uses.

The Decatur-Dewey-Allen Soil Association is found in the north central part of the basin and includes southeastern Shelby County and southwestern Talladega County. Soils in this association are highly suitable for crop production, pasture and woodland growth. These soils present only slight limitations for the use of septic systems and recreational development. The low strength of these soils, however, does present some moderate limitations for structural development, including local roads and streets, small commercial buildings, and dwellings without basements.

The Tallapoosa-Tatum Soil Association is the most predominant soil association within the Lower Coosa River Basin, encompassing the most land area. This soil association is located in the northeastern and central part of the basin, including southeastern Talladega County, southwestern Clay County, the northeastern two-thirds of Coosa County and western Chilton County. These soils are not suitable for agricultural uses because of their severe slope and drought properties, however, they are suitable for woodland growth. It is within this soil association that a portion of the Talladega National Forest and the Weogufka State Forest are located. Unfortunately, the association's severe slopes, ranging from 6 to 50 percent, and shallow depth to bedrock present severe limitations to all structural development. As a result of the soil properties, this is the most heavily forested portion of the basin.



Source: U.S. Corps of Engineers; State of Alabama Environmental Data Inventory; January 1, 1981.

Located along the central western boundary of the basin in central Chilton County is the Savannah-Ruston-Stough Soil Association. With slopes ranging from 0 to 6 percent, soils in this association are highly suitable for crop production, pasture and woodland growth. Severe limitations for septic system usage are present in this area due to the slow perc rate of the soils. These soils also have moderate limitations due to low strength and wetness characteristics for development of local roads and streets, small commercial buildings and dwellings without basements. Small slopes also present moderate limitations for use as picnic areas and playgrounds. Only slight limitations, however, are present for use of soils in this association for camping and for path and trail development and usage.

Also located along the western boundary of the Lower Coosa River Basin, just south of the Savannah-Ruston-Stough Association in eastern Autauga and Chilton counties is a small band of soils in the Smithdale-Troup-Lucedale-Luverne Association. These soils are not suitable for crop production; are moderately suitable for pastureland; and are highly suitable for woodland growth. The steep slope characteristics of the soils present severe limitations for all types of structural development and moderate limitations for the construction and use of paths and trails.

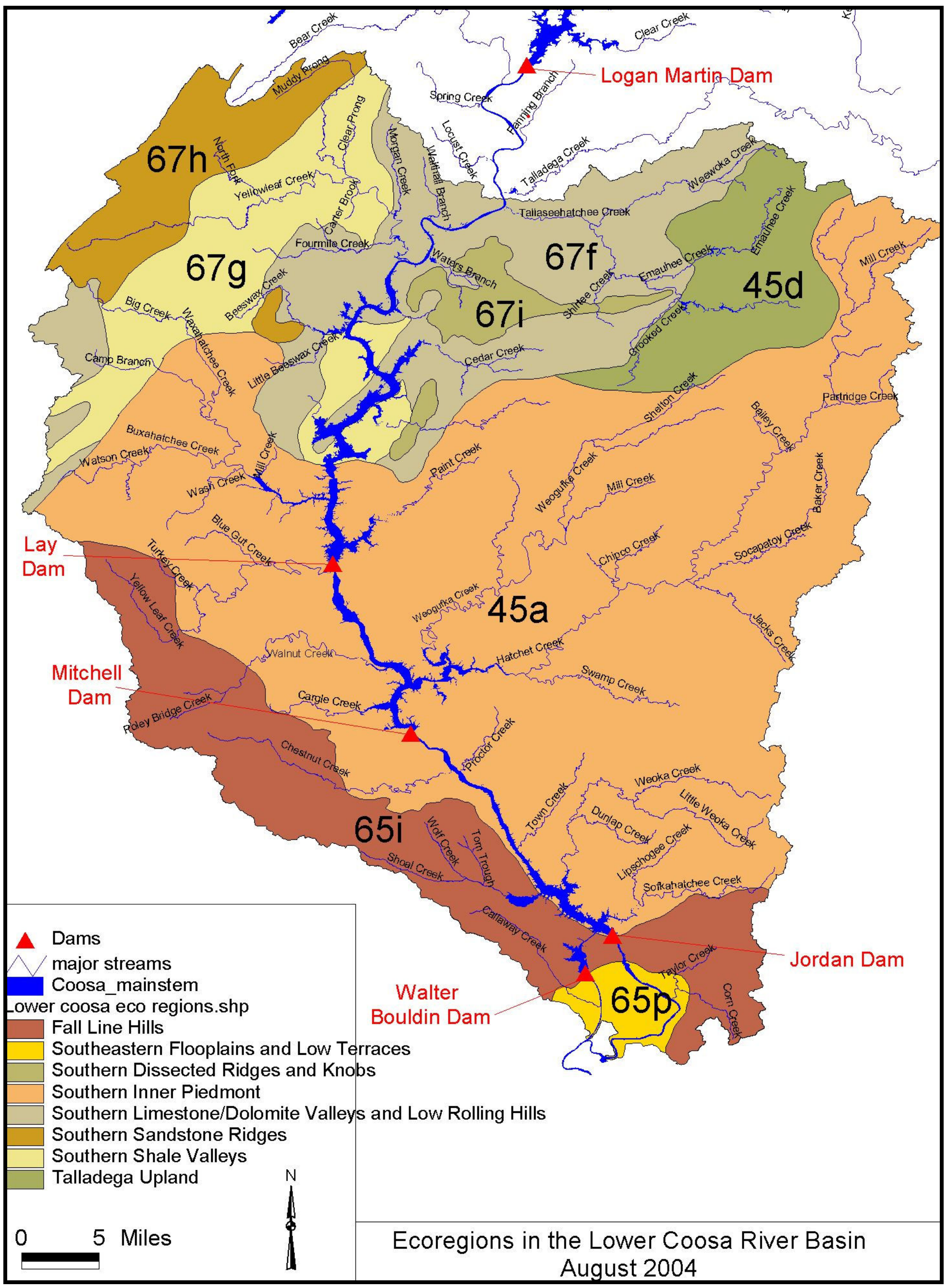
The southeastern part of the basin, lying in western Coosa County and northern Elmore County is comprised of soils in the Cecil-Grover-Madison Soil Association. While these soils are not suitable for crop production due to the presence of steep slopes ranging from 2 to 25 percent, they are highly suitable for use as pastureland and woodland. Soils in this association present moderate limitations to most types of structural development due to slow perc rates, low strength and steep slopes. Although the slope characteristics of the soils present severe limitations for playground uses, there are only slight limitations for the use of these soils in the construction and use of paths and trails.

The southern tip of the Lower Coosa River basin, east of the Coosa River, in Elmore County is comprised of soils in the Dothan-Fuquay-Wagram Soil Association. These are some of the better soils in the basin, with slopes ranging from 2 to 15 percent and characteristics that make them highly suitable for both crop production and pastureland, and for woodland growth. These soils present only slight limitations to most types of structural development. The association's slow perc characteristics, however, present moderate limitations for use of septic systems; and the presence of some slopes presents moderate limitations for the construction of small commercial buildings and playgrounds.

The last major soil association is the Lucedale-Bama Soil Association, which is located in the southernmost part of the basin west of the Coosa River and in small concentrations in northern Elmore County east of the Coosa River. These soils have minimal slope, ranging from 0 to 5 percent, and are highly suitable for use as cropland, pastureland and woodland. Additionally, these soils present only slight limitations to all types of structural development.

Basin Ecoregions and Protected Species________________________________

The Lower Coosa is located within three Level III Ecoregions: the Ridge and Valley across the northern part of the basin; the Piedmont through the central part of the basin; and the western and southern boundaries are in the Southeastern Plains. Eight Level IV Ecoregions are found within the Lower Coosa River Basin, four of which are divisions of the Ridge and Valley, two of which are divisions of the Piedmont, and two of which are divisions of the Southeastern Plains.



Listed below are protected species that may be found throughout the Lower Coosa River Basin. This list includes Federal listed and Alabama listed endangered, threatened and candidate species. Species whose range does not encompass the entire Lower Coosa River Basin are listed within the watershed(s) section where their range has been identified. There are no protected plant species that are found throughout the basin. There are, however, ten protected plant species that are found in the various watersheds of the Lower Coosa River basin.

Protected Species in the Lower Coosa River Basin		
Vertebrates		
Common Name	**Scientific Name**	**Distribution in Lower Coosa River**
Blue Sucker	*Cycleptus elongates*	Riverine habitat throughout basin
Alligator Snapping Turtle	*Macroclemys temminckii*	Throughout basin
Northern Pine Snake	*Pituophis melanoleucus*	Throughout basin
Eastern Box Turtle	*Terrapene carolina*	Throughout basin, esp. forested floodplains
Cooper's Hawk	*Accipiter cooperii*	Throughout basin
Southeastern American Kestrel	*Falco sparverius paulus*	Throughout basin
Black Rail	*Laterallus jamaicensis*	Throughout basin, county data not available
Southeastern Weasel	*Mustela frenata olivacea*	Throughout basin, county data not available
Southeastern Myotis	*Myotis austroriparius*	Throughout basin
Rafinesque's Big-eared Bat	*Plecotus rafinesquii*	Throughout basin
Brazilian Free-tailed Bat	*Tadarida brasiliensis*	Throughout basin, county data not available
Invertebrates		
Common Name	**Scientific Name**	**Distribution in Lower Coosa River**
Alabama Moccasinshell	*Medionidus acutissimus*	Coosa River drainage
Coosa Moccasinshell	*Medionidus parvulus*	Tributaries to Coosa River
Shoal Sprite	*Amphigyra alabamensis*	Throughout basin, no county data available
Cylindrical lioplax	*Lioplax cyclostomaformis*	Throughout basin
Snail	*Neoplanoribis carinatus* *Neoplanorbis smithi* *Neoplanorbis tantillus* *Neoplanorbis umbilicatus*	Endemic to the Coosa River system. All known habitat has been inundated by Lay Dam, Jordan Dam and Mitchell Dam. Presumed extinct.
Rough Hornsnail	*Pleurocera foremani*	Throughout basin. May be extinct.
Wicker ancylid	*Rhodacme filosa*	Throughout basin, county data not available.
Coosa Pebblesnail	*Somatogyrus coosaensis*	Throughout basin
Dwarf Pebblesnail	*Somatogyrus nanus*	Main stem throughout basin. Weogufka Creek, Elmore County.
Moon Pebblesnail	*Somatogyrus obtusus*	Chilton-Coosa County shoals
Pygmy Pebblesnail	*Somatogyrus pygmaeus*	Chilton County. May be extinct.
Quadrate Pebblesnail	*Somoatogyrus quadratus*	Coosa River. County data not available.
Sixbanded Longhorn Beetle	*Dryobis sexnotatus*	Throughout basin, county data not available

Basin Demographics

Population - Urban / Rural	Number	Percent
Total Population	109,710	100.00%
Urban	27,917	60.51%
Rural	81,792	74.55%
Farm	1,693	2.07%
Nonfarm	80,099	97.93%

Population By Race	Number	Percent
Total Population	109,710	100.00%
White	87,008	79.31%
Black	20,649	18.82%
American Indian / Alaskan	447	0.41%
Asian	279	0.25%
Native Hawaiian / Pacific Isl.	12	0.01%
Some Other Race	419	0.38%
Two or More Races	896	0.82%

Population By Age	Number	Percent
Total Population	109,710	100.00%
Under 18	27,660	25.21%
18 to 29 Years	16,148	14.72%
30 to 49 Years	32,877	29.97%
50 to 64 Years	18,316	16.69%
65 Years and Older	14,708	13.41%

Population in Households	Number	Percent
Total Population	109,710	100.00%
Population In households	107,175	97.69%
In Family Households	94,797	86.41%
In NonFamily Households	12,378	11.28%
In Group Quarters	2,535	2.31%
Institutionalized	2,332	91.98%
Noninstitutionalized	203	8.01%

Educational Attainment	Number	Percent
Total Population (25 & Over)	73,135	100.00%
No schooling completed	905	1.24%
Some School, No Diploma	20,200	27.62%
High School Graduate, GED	25,858	35.36%
Some College, No Degree	13,944	19.07%
Associate degree	3,207	4.39%
Bachelor's degree	5,647	7.72%
Master's degree	2,429	3.32%
Professional school degree	713	0.97%
Doctorate degree	231	0.32%

Place of Birth	Number	Percent
Total	109,710	100.00%
Native	108,820	99.19%
Born in Alabama	89,743	82.47%
Born in Northeast	1,796	1.65%
Born in Midwest	3,850	3.54%
Born in South	11,280	10.37%
Born in West	1,574	1.45%
Born outside US	578	0.53%
Foreign Born	889	0.81%
Naturalized citizen	428	48.41%
Not a citizen	461	51.90%

Residence in 1995	Number	Percent
Total Population 5 and Over	102,624	100.00%
Same house in 1995	61,814	60.23%
Different house in 1995	40,810	39.77%
In United States in 1995	40,181	39.15%
Same County	22,008	21.45%
Different county	18,172	17.71%
Different county; Same state	12,628	12.30%
Different state	5,545	5.40%
Different state; Northeast	361	6.52%
Different state; Midwest	928	16.74%
Different state; South	3,498	63.09%
Different state; West	757	13.65%
Elsewhere	606	0.59%

Basin Economics and Employment

Median Family Income, 1999	$41,843
Median Household Income, 1999	$34,975
Median Per Capita Income, 1999	$16,881

Employment Status	Number	Percent
Population (16 and over)	85,246	100.00%
In labor force	49,873	58.50%
In Armed Forces	157	0.31%
Civilian	49,716	99.68%
Civilian; Employed	46,815	94.16%
Civilian; Unemployed	2,901	5.84%
Not in labor force	35,374	41.50%

Place of Work	Number	Percent
Workers (16 and over)	46,194	100.00%
Worked in Alabama	45,821	99.19%
In county of residence	26,320	57.44%
Outside county of residence	19,502	42.56%
Worked outside Alabama	373	0.81%

Transportation To Work	Number	Percent
Workers (16 and Over)	46,194	100.00%
Car; truck; or van	44,431	96.18%
Drove alone	38,405	86.44%
Carpooled	6,026	13.56%
Public transportation	83	0.18%
Motorcycle	12	0.03%
Bicycle	10	0.02%
Walked	437	0.95%
Other means	266	0.58%
Worked at home	956	2.07%

Travel Time to Work	Number	Percent
Workers (16 and Over)	46,194	100.00%
Did Not Work at Home	45,239	97.93%
Less than 5 minutes	1,352	2.99%
5 to9 minutes	4,693	10.37%
10 to 19 minutes	11,991	26.51%
20 to 29 minutes	6,942	15.34%
30 to 39 minutes	8,117	17.94%
40 to 59 minutes	10,660	23.56%
60 to 89 minutes	1,484	3.28%
90 or more minutes	956	2.07%
Worked at Home	46,194	100.00%

Employment By Industry	Number	Percent
Employed, 16 and Over	46,815	100.00%
Agri; Forestry; Fish/Hunt	588	1.26%
Mining	548	1.17%
Construction	5,031	10.75%
Manufacturing	9,588	20.48%
Wholesale Trade	1,619	3.46%
Retail Trade	5,629	12.02%
Transportation/Warehousing	1,638	3.50%
Utilities	1,102	2.35%
Information	988	2.11%
Finance and Insurance	2,196	4.69%
Real Estate	516	1.10%
Prof; Scientific; Tech Svcs	1,412	3.02%
Mgmt of Companies/Ent	30	0.06%
Admin; Waste Mgmt Svcs	1,102	2.35%
Educational Services	3,455	7.38%
Health Care/Social Assist.	4,055	8.66%
Arts; Entertainment; Rec	421	0.90%
Accommodation/Food Svcs	2,231	4.76%
Public Administration	2,200	4.70%
Other Services	2,467	5.27%

Basin Housing

Median Year Structure Built	1977

Housing	Number	Percent
Total Housing Units	49,042	100.00%
Urban	12,126	24.73%
Rural	36,916	75.27%

Housing Occupancy	Number	Percent
Total	49,042	100.00%
Occupied	42,404	86.46%
Owner Occupied	33,843	79.81%
Renter Occupied	8,560	20.19%
Vacant	6,639	13.54%
For Rent	938	14.12%
For Sale Only	710	10.69%
Rented or Sold;	408	6.14%
For Seasonal Use	2,723	41.01%
For Migrant Workers	6	0.09%
Other vacant	1,855	27.95%

Household Size	Number	Percent
Total Occupied Housing Units	42,404	100.00%
1-person household	10,248	24.17%
2-person household	14,405	33.97%
3-person household	8,085	19.07%
4-person household	6,056	14.28%
5-person household	2,504	5.90%
6-person household	707	1.67%
7-or-more-person household	400	0.94%

Average Household Size	# Persons
All Housing Units	2.53
Owner occupied	2.59
Renter occupied	2.28

Units & Rooms in Structure	Number	Percent
Housing units: Total	49,042	100.00%
1 Unit - Detached	31,413	64.05%
1 Unit - Attached	482	0.98%
2 units in structure	963	1.96%
3 or 4 units in structure	954	1.95%
5 to 9 units in structure	734	1.50%
10 to 19 units in structure	194	0.40%
20 to 49 units in structure	260	0.53%
50 or more units in structure	276	0.56%
Mobile home	13,642	27.82%
Boat; RV; van; etc.	125	0.26%
Median number of rooms		5.46

House Heating Fuel	Number	Percent
Total Occupied Housing Units	42,404	100.00%
Utility gas	10,265	24.21%
Bottled; tank; or LP gas	11,871	28.00%
Electricity	19,236	45.36%
Fuel oil; kerosene; etc.	214	0.50%
Coal or coke	7	0.02%
Wood	653	1.54%
Solar energy	7	0.02%
Other fuel	72	0.17%
No fuel used	80	0.19%

Telephone Service	Number	Percent
Total Occupied Housing Units	42,404	100.00%
Telephone Service Available	40,604	95.76%
No Telephone Service Available	1,800	4.24%

Vehicles Available	Number	Percent
Total Occupied Housing Units	42,404	100.00%
No vehicle available	3,205	7.56%
1 vehicle available	12,139	28.63%
2 vehicles available	16,699	39.38%
3 vehicles available	7,278	17.16%
4 vehicles available	2,045	4.82%
5 or more vehicles available	1,037	2.45%

Plumbing Facilities	Number	Percent
Total Housing Units	49,042	100.00%
Complete plumbing facilities	48,330	98.55%
Lacking complete plumbing facilities	713	1.45%

Kitchen Facilities	Number	Percent
Total Housing Units	49,042	100.00%
Complete kitchen facilities	48,311	98.51%
Lacking complete kitchen facilities	732	1.49%

Tallaseehatchee Creek Watershed
HUC: 03150107-010

Watershed Area:	128,147 ac.
Percent of Basin:	10.25%
Type:	Urban
County-Headwaters:	Clay
County-Mouth:	Talladega
Municipalities:	Childersburg Sylacauga
Total Population:	27,086
Percent of Basin:	24.69%

Land Use

Lakes and Ponds	2,208 ac
Cropland	3,305 ac
Pastureland	9,914 ac
Forestland	87,353 ac
Urbanized	17,626 ac
Mined Land	4,406 ac
Other Land	3,335 ac

Animal Data

Cattle	3,705
Dairy	250
Swine	330
Broilers	0
Layers	0
Catfish Acres	900

Domestic Water Data

Septic Tanks	15
Failing Septic Tanks	1
Alternative Systems	0

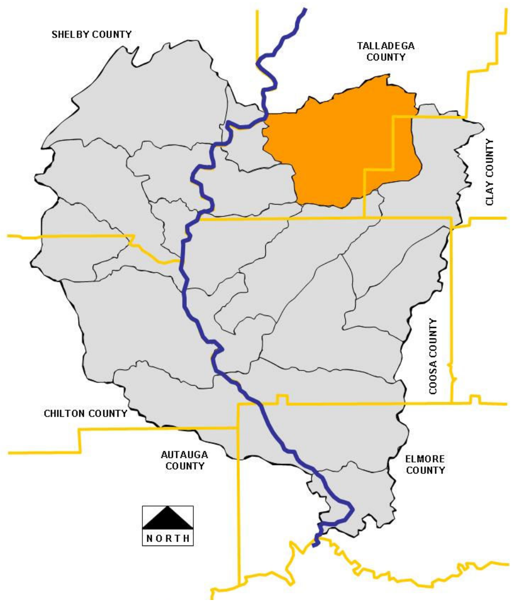
Sediment Loads (in tons)

Total	360,708
Cropland	7,929
Sand & Gravel Pits	14,000
Mined Land	18,000
Developing Urban Land	80,000
Gullies	2,800
Critical Areas	36,750
Streambanks	37,800
Dirt Roads and Banks	119,610
Woodland	43,819

Water Users

Public Water Supply	1
Total Permitted Dischargers	42
Municipal	5
Industrial	33
Mining	4

Tallaseehatchee Creek Watershed Location Map



Impaired Water Bodies..None

Active Water Quality Monitoring Sites..................None

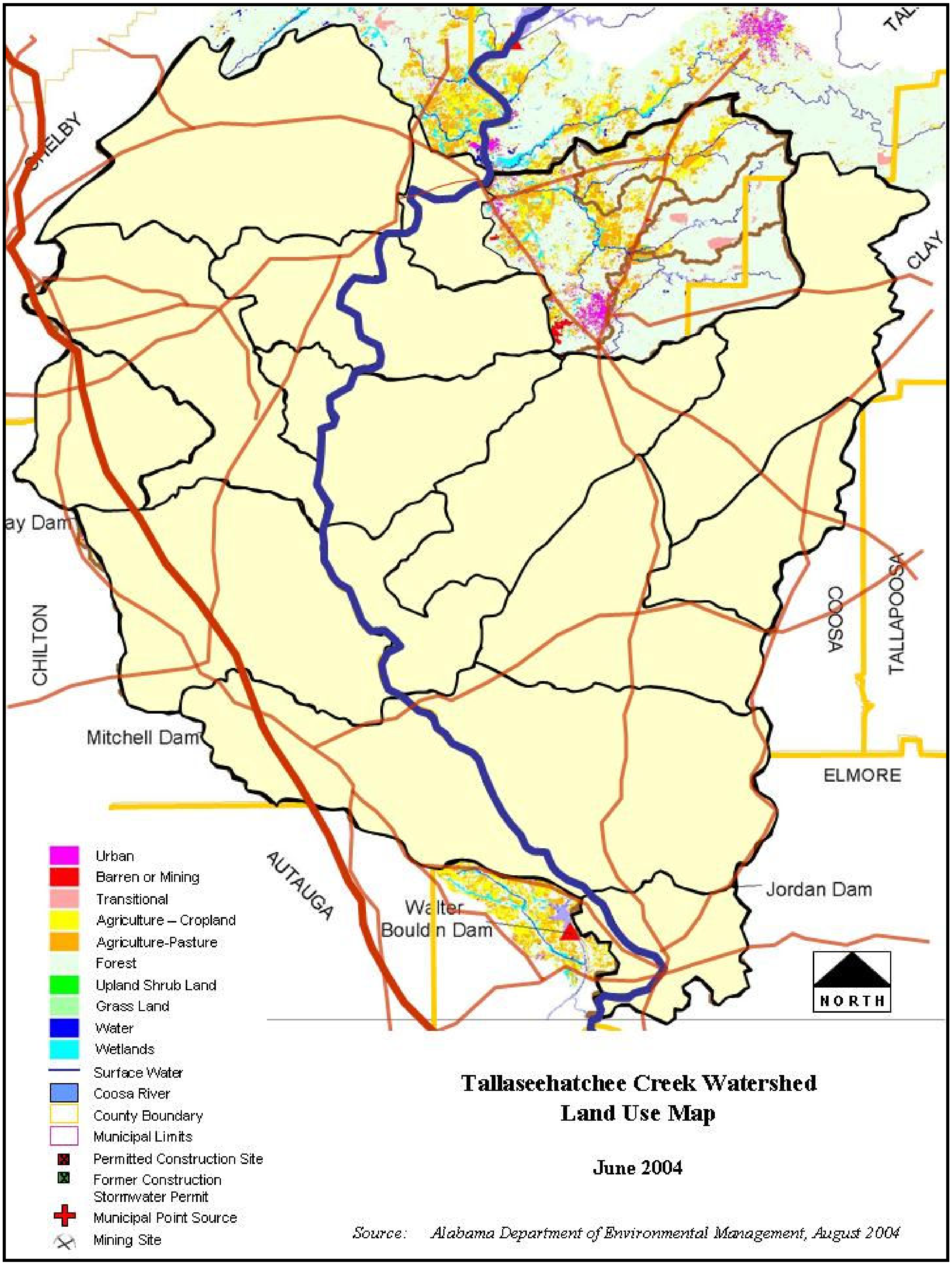
Suitability for Development................................. Good

2005 Priority Watershed Rating............................. High

<u>Major Contributing Factors</u>

- ADEM Assessment Rating for Nonpoint Source Pollution
- Alabama Water Watch Water Quality Monitoring and Results
- Use Classification
- Urban Land Uses
- Volume of NPDES Permitted Dischargers
- Housing Density
- High Unemployment Rate
- Significant Number of Historic Resources Present

Land Use – 010



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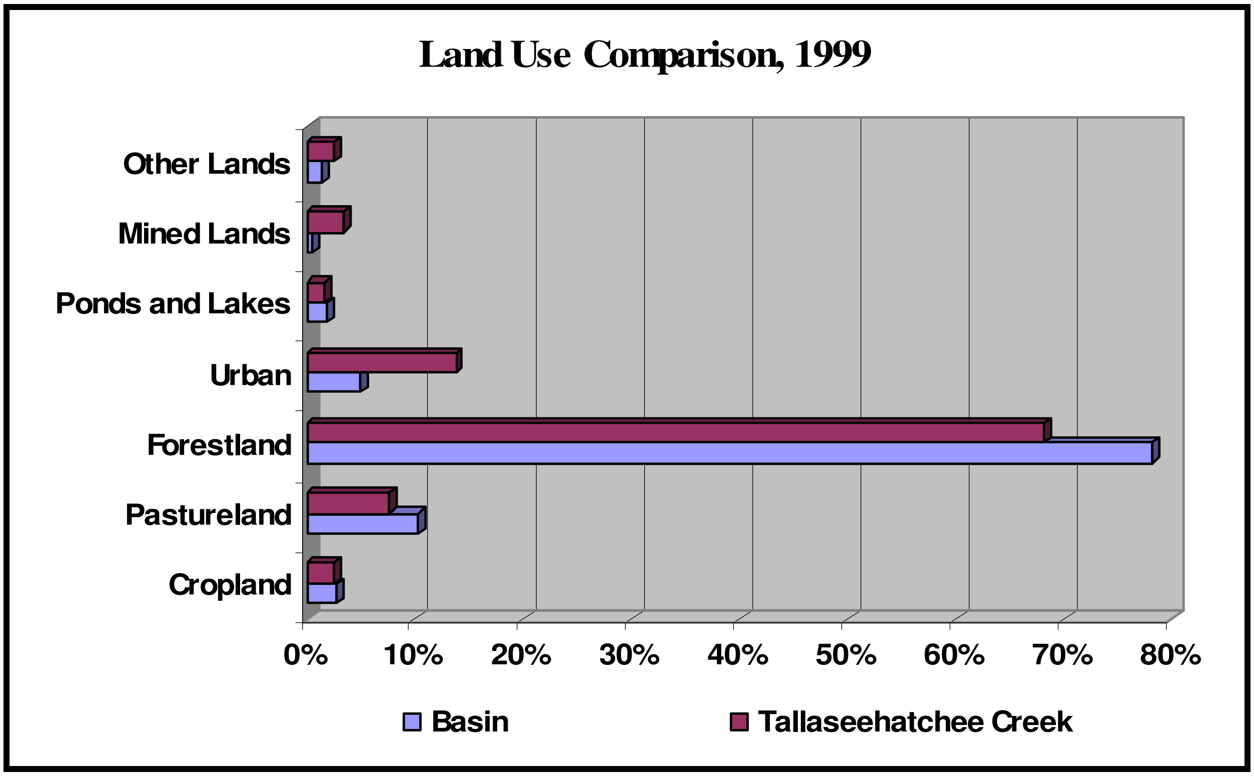
TALLAPOOSA
Mitchell Dam
ELMORE
AUTAUGA
Walter Bouldin Dam
Jordan Dam
NORTH
Urban
Barren or Mining
Transitional
Agriculture – Cropland
Agriculture-Pasture
Forest
Upland Shrub Land
Grass Land
Water
Wetlands
Surface Water
Coosa River
County Boundary
Municipal Limits
Permitted Construction Site
Former Construction Stormwater Permit
Municipal Point Source
Mining Site
Tallaseehatchee Creek Watershed Land Use Map
June 2004
Source: Alabama Department of Environmental Management, August 2004



Land Use Patterns

Overall, the Tallaseehatchee Creek watershed has an urban character, with 14 percent of the land in urban land uses, as compared with 5 percent of the land in the Lower Coosa River Basin in urban use. The urban land uses are primarily concentrated in the western part of the watershed around the Childersburg and Sylacauga areas and along the U.S. Highway 231 corridor which connects the two cities. The majority of the land in the watershed, at 68 percent, is forest land and accounts for the presence of the Talladega National Forest in the eastern part of the watershed. The percentage of deciduous forest land in the watershed, at 32.92 percent, is comparable with that of the basin, at 33.07 percent. Still the proportion of forest land in this watershed is considerably less than the basin percentage of forest land at 78 percent. Agricultural land encompasses 11 percent of the land area, of which 3 percent is crop land and 8 percent is pasture land. Agricultural land uses can be found north of Sylacauga and east of Childersburg in the central portion of the basin.

The watershed is traversed by four major roads. U.S. Highway 280/231 runs north-south along the western boundary; State Highway 21 runs north-south through the central portion of the basin, State Highway 148 runs east-west in the southern part of the basin; and State Highway 76 runs east-west along the northwestern boundary. Traffic volume along these highways has mostly remained level or increased at a rate between 8 and 20 percent between 1994 and 2002. Near Winterboro, traffic volume on Highway 76 increased significantly in the same time period, at 33.96 percent. The same is true on Highway 21, just north of Highway 76, which had an increase of 24.48 percent. Traffic volume did decrease, however, along the western part of Highway 76, at -37.01 percent near DeSoto Caverns, and -.44 percent east of U.S. Highway 280.

Soils and Species – 010

The Tallaseehatchee Creek watershed is comprised mostly of soils in two soil associations: the Decatur-Dewey-Allen Association and the Tallapoosa-Tatum Association. In addition, soils from two other soil associations are present in smaller quantities. The western half of the watershed is comprised, primarily, of soils in the Decatur-Dewey-Allen Association, while soils in the eastern half of the watershed are in the Tallapoosa-Tatum Association. Soils in the Minvale-Fullerton Association and Minvale-Bodine-Fullerton Association are present in the northern tips of the watershed. There is also a small swath of soils in the Tallapoosa-Tatum Association, running southwest to northeast through the Decatur-Dewey-Allen Association in the western part of the watershed. The soil suitability and limitations for selected uses are provided in the table below. For a map of the soil associations in the watershed and in the Lower Coosa River Basin, refer to the Soil Association Map on page 9.

Soil Association Number and Name	6: Decatur-Dewey-Allen	10: Minvale-Bodine-Fullerton	11 Minvale-Fullerton	25 Tallapoosa-Tatum
Dominant Slope, %	1 - 10	6 - 35	2 - 20	6 - 50
Soil Suitability and Major Limitations For:				
Cropland	Good	Poor: slope, small stones, droughty	Fair: slope	Poor: slope, droughty
Pastureland	Good	Fair: slope, droughty	Good	Poor: slope
Woodland	Good	Good	Good	Good
Soil Limitations For:				
Septic Systems	Slight	Severe: slope	Moderate: slope	Severe: slope, depth to bedrock
Local Roads and Streets	Moderate: low strength	Severe: slope	Moderate: low strength, slope	Severe: slope
Small Commercial Buildings	Moderate	Severe: slope	Severe: slope	Severe: slope
Dwellings without Basements	Moderate	Severe: slope	Moderate: slope	Severe: slope
Camp Areas	Slight	Severe: slope	Moderate: slope	Severe: slope
Picnic Areas	Slight	Severe: slope	Moderate: slope	Severe: slope
Playgrounds	Slight	Severe: slope	Moderate: slope	Severe: slope
Paths and Trails	Slight	Moderate: slope	Slight	Severe: slope

The Tallaseehatchee Creek watershed is located in two Level III Ecoregions. The west part of the watershed is in the Ridge and Valley and the eastern part of the watershed is in the Piedmont. In addition to the protected species found throughout the Lower Coosa River Basin (listed on page 14), the following protected species are found in the Tallaseehatchee Creek watershed.

Common Name	Scientific Name	Distribution in Lower Coosa River Basin
Bachman's Sparrow	*Aimophila aestivalis*	Coastal Plain and Piedmont province
Bald Eagle	*Haliaeetus leucocephalus*	Coastal Plain and Piedmont province
Appalachian Bewick's wren	*Thryomanes bewickii altus*	North of the Fall Line, particularly in Ridge and Valley province
Fine-lined Pocketbook	*Lampsilis altilis*	Yellowleaf Creek; Tallaseehatchee Creek
Mud Elimia	*Elimia alabamensis*	Shelby, Talladega, Chilton, Coosa Counties
Lacy Elimia	*Elimia crenatella*	Weewoka Creek, Talladega County
Upland Hornsnail	*Pleurocera showalteri*	Shelby and Talladega Counties
Nevius Stonecrop	*Sedum nevii*	Chilton, Coosa, Talladega Counties
Roundleaf Meadowrue	*Thalictrum subrotundum*	Autauga, Clay Counties

Demographics – 010

Population - Urban / Rural	Number	Percent
Total Population	27,086	100.00%
Urban	16,389	60.51%
Rural	10,697	39.49%
Farm	224	2.10%
Nonfarm	10,473	97.90%

Population By Race	Number	Percent
Total Population	27,086	99.64%
White	19,308	71.29%
Black	7,373	27.22%
American Indian / Alaskan	96	0.36%
Asian	131	0.12%
Native Hawaiian / Pacific Isl.	0	0.00%
Some Other Race	27	0.10%
Two or More Races	150	0.55%

Population By Age	Number	Percent
Total Population	27,086	100.00%
Under 18	6,873	25.38%
18 to 29 Years	4,001	14.77%
30 to 49 Years	7,629	28.17%
50 to 64 Years	4,296	15.86%
65 Years and Older	4,286	15.82%

Population in Households	Number	Percent
Total Population	27,086	100.00%
Population In households	26,840	99.09%
In Family Households	23,198	86.43%
In NonFamily Households	3,643	13.57%
In Group Quarters	245	0.91%
Institutionalized	116	47.40%
Noninstitutionalized	129	52.60%

Educational Attainment	Number	Percent
Total Population (25 & Over)	17,903	100.00%
No schooling completed	217	1.21%
Some School, No Diploma	5,283	29.51%
High School Graduate, GED	6,315	35.27%
Some College, No Degree	3,315	18.52%
Associate degree	770	4.30%
Bachelor's degree	1,202	6.71%
Master's degree	646	3.61%
Professional school degree	123	0.69%
Doctorate degree	32	0.18%

Place of Birth	Number	Percent
Total	27,086	100.00%
Native	26,877	99.23%
Born in Alabama	23,210	86.36%
Born in Northeast	312	1.16%
Born in Midwest	678	2.52%
Born in South	2,270	8.45%
Born in West	321	1.19%
Born outside US	87	0.32%
Foreign Born	209	0.77%
Naturalized citizen	91	43.66%
Not a citizen	118	56.34%

Residence in 1995	Number	Percent
Total Population (5 and Over)	25,320	100.00%
Same house in 1995	15,794	62.38%
Different house in 1995	9,526	37.62%
In United States in 1995	9,364	98.31%
Same County	6,223	66.45%
Different county	3,142	33.55%
Different county; Same state	1,735	18.53%
Different state	1,406	15.02%
Different state; Northeast	136	9.63%
Different state; Midwest	315	22.42%
Different state; South	747	53.14%
Different state; West	208	14.80%
Elsewhere	161	1.69%

Economics and Employment – 010

Median Family Income, 1999	$36,947
Median Household Income, 1999	$30,136
Median Per Capita Income, 1999	$15,050

Employment Status	Number	Percent
Population (16 and over)	21,048	100.00%
In labor force	11,890	56.49%
In Armed Forces	2	0.01%
Civilian	11,889	99.99%
Civilian; Employed	10,933	91.96%
Civilian; Unemployed	956	8.04%
Not in labor force	9,158	43.51%

Place of Work	Number	Percent
Workers (16 and over)	10,812	100.00%
Worked in Alabama	10,738	99.31%
In county of residence	8,544	79.56%
Outside county of residence	2,195	20.44%
Worked outside Alabama	74	0.69%

Transportation To Work	Number	Percent
Workers (16 and Over)	10,812	100.00%
Car; truck; or van	10,440	96.55%
Drove alone	8,993	86.14%
Carpooled	1,447	13.86%
Public transportation	19	0.17%
Motorcycle	5	0.05%
Bicycle	0	0.00%
Walked	127	1.18%
Other means	103	0.95%
Worked at home	119	1.10%

Travel Time to Work	Number	Percent
Workers (16 and Over)	10,812	100.00%
Did Not Work at Home	10,693	98.90%
Less than 5 minutes	421	3.94%
5 to9 minutes	2,102	19.65%
10 to 19 minutes	4,071	38.07%
20 to 29 minutes	1,296	12.12%
30 to 39 minutes	974	9.11%
40 to 59 minutes	845	7.90%
60 to 89 minutes	644	6.02%
90 or more minutes	340	3.18%
Worked at Home	119	1.10%

Employment By Industry	Number	Percent
Employed, 16 and Over	10,933	100.00%
Agri; Forestry; Fish/Hunt	78	0.72%
Mining	232	2.12%
Construction	786	7.19%
Manufacturing	3,088	28.25%
Wholesale Trade	306	2.80%
Retail Trade	1,308	11.97%
Transportation/Warehousing	368	3.37%
Utilities	216	1.98%
Information	220	2.01%
Finance and Insurance	375	3.43%
Real Estate	75	0.69%
Prof; Scientific; Tech Svcs	226	2.07%
Mgmt of Companies/Ent	0	0.00%
Admin; Waste Mgmt Svcs	143	1.31%
Educational Services	940	8.60%
Health Care/Social Assist.	944	8.63%
Arts; Entertainment; Rec	90	0.83%
Accommodation/Food Svcs	639	5.85%
Public Administration	353	3.23%
Other Services	544	4.97%

Housing – 010

Median Year Structure Built		1968

Housing	Number	Percent
Total Housing Units	12,011	100.00%
Urban	7,439	61.93%
Rural	4,572	38.07%

Housing Occupancy	Number	Percent
Total	12,011	100.00%
Occupied	10,924	90.95%
Owner Occupied	7,975	73.01%
Renter Occupied	2,949	26.99%
Vacant	1,087	9.05%
For Rent	349	32.08%
For Sale Only	173	15.92%
Rented or Sold;	36	3.33%
For Seasonal Use	129	11.89%
For Migrant Workers	0	0.00%
Other vacant	400	36.78%

Household Size	Number	Percent
Total Occupied Housing Units	10,924	100.00%
1-person household	3,096	28.34%
2-person household	3,475	31.81%
3-person household	1,934	17.70%
4-person household	1,513	13.85%
5-person household	620	5.67%
6-person household	188	1.72%
7-or-more-person household	99	0.91%

Average Household Size	# Persons
All Housing Units	2.50
Owner occupied	2.57
Renter occupied	2.55

Units & Rooms in Structure	Number	Percent
Housing units: Total	12,011	100.00%
1 Unit - Detached	7,869	65.51%
1 Unit - Attached	157	1.31%
2 units in structure	563	4.69%
3 or 4 units in structure	420	3.50%
5 to 9 units in structure	342	2.84%
10 to 19 units in structure	45	0.37%
20 to 49 units in structure	99	0.82%
50 or more units in structure	222	1.84%
Mobile home	2,288	19.05%
Boat; RV; van; etc.	7	0.06%
Median number of rooms		5.41

House Heating Fuel	Number	Percent
Total Occupied Housing Units	10,924	100.00%
Utility gas	4,955	45.36%
Bottled; tank; or LP gas	1,641	15.03%
Electricity	4,141	37.91%
Fuel oil; kerosene; etc.	67	0.61%
Coal or coke	0	0.00%
Wood	90	0.82%
Solar energy	7	0.06%
Other fuel	0	0.00%
No fuel used	23	0.21%

Telephone Service	Number	Percent
Total Occupied Housing Units	10,924	100.00%
Telephone Service Available	10,400	95.20%
No Telephone Service Available	524	9.41%

Vehicles Available	Number	Percent
Total Occupied Housing Units	10,924	100.00%
No vehicle available	1,160	10.62%
1 vehicle available	3,709	33.95%
2 vehicles available	3,886	35.57%
3 vehicles available	1,543	14.12%
4 vehicles available	448	4.10%
5 or more vehicles available	179	1.64%

Plumbing Facilities	Number	Percent
Total Housing Units	12,011	100.00%
Complete plumbing facilities	11,761	97.92%
Lacking complete plumbing facilities	250	2.08%

Kitchen Facilities	Number	Percent
Total Housing Units	12,011	100.00%
Complete kitchen facilities	11,775	98.03%
Lacking complete kitchen facilities	236	1.97%

Rating and Issues – 010

Criteria	Rating
Impaired Water Bodies	1
ADEM Basin Assessment Rating for NPS Potential	5
NRCS Priority Watershed	3
AWW Water Quality Monitoring and Results	5
Use Classification	5
Land Use Character	5
Potential for Silviculture	3
Sediment Loads	2
Animal Density	4
Soil Suitability for Development	2
Growth Rate of County	2
Increase in Traffic Volume	4
Number of Permitted Dischargers	5
Presence of Hydroelectric Dam	1
Housing Density	5
Septic System Density	1
Number of Endangered Species	4
2000 Unemployment Rate	5
Total	**62 High**

With a rating score of 62, the Tallassehatchee Creek watershed is considered to be a high priority watershed in the Lower Coosa River Basin. For more information on the watershed rating and ranking system, refer to the *Lower Coosa River Basin Management Plan*, Part IV, Chapter 12: Priority Watersheds.

A total of 23 issues were identified in the Lower Coosa River Basin. Of these, ten are present in the Tallassehatchee Creek watershed, of which five are basinwide issues, four are regional issues and one is a local concern. The focus of the regional watershed management measures for this watershed is mitigating stormwater runoff and protection of aquatic habitats.

Refer to the Lower Coosa River Basin Management Plan, Part IV, Chapter 14: Water Quality Improvement Strategy for management measures that may be implemented in this watershed.

Basinwide Issues:
- Endangered Species
- Lack of Water Quality Trend Data
- Illegal Dumping
- Lack of Education and Awareness
- FERC Relicensing of Hydroelectric Facilities

Regional Issues:
- Compliance with the *Recovery Plan for the Mobile River Basin Aquatic Ecosystem*
- Agricultural Runoff
- Silviculture Runoff
- Urban Runoff

Local Concerns:
- Point Source Discharges

Walthall Branch Watershed
HUC: 03150107-020

Watershed Area:	8,611 ac.
Percent of Basin:	0.69%
Type:	Agricultural
County-Headwaters:	Shelby
County-Mouth:	Shelby
Municipalities:	Harpersville
Total Population:	798
Percent of Basin:	0.73%

Land Use	
Lakes and Ponds	360 ac
Cropland	1,050 ac
Pastureland	2,570 ac
Forestland	4,331 ac
Urbanized	300 ac
Mined Land	0 ac
Other Land	0 ac

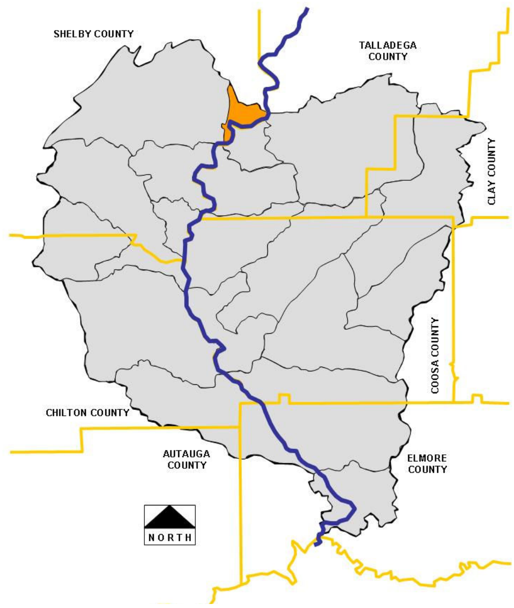
Animal Data	
Cattle	1,200
Dairy	0
Swine	0
Broilers	0
Layers	0
Catfish Acres	0

Domestic Water Data	
Septic Tanks	200
Failing Septic Tanks	6
Alternative Systems	5

Sediment Loads (in tons)	
Total	87,734
Cropland	2,835
Sand & Gravel Pits	0
Mined Land	0
Developing Urban Land	60,000
Gullies	0
Critical Areas	14,000
Streambanks	600
Dirt Roads and Banks	9,000
Woodland	1,299

Water Users	
Public Water Supply	0
Total Permitted Dischargers	0
Municipal	0
Industrial	0
Mining	0

Walthall Branch Watershed Location Map



Impaired Water Bodies.................................. Lay Lake

Active Water Quality Monitoring Sites........................ 0

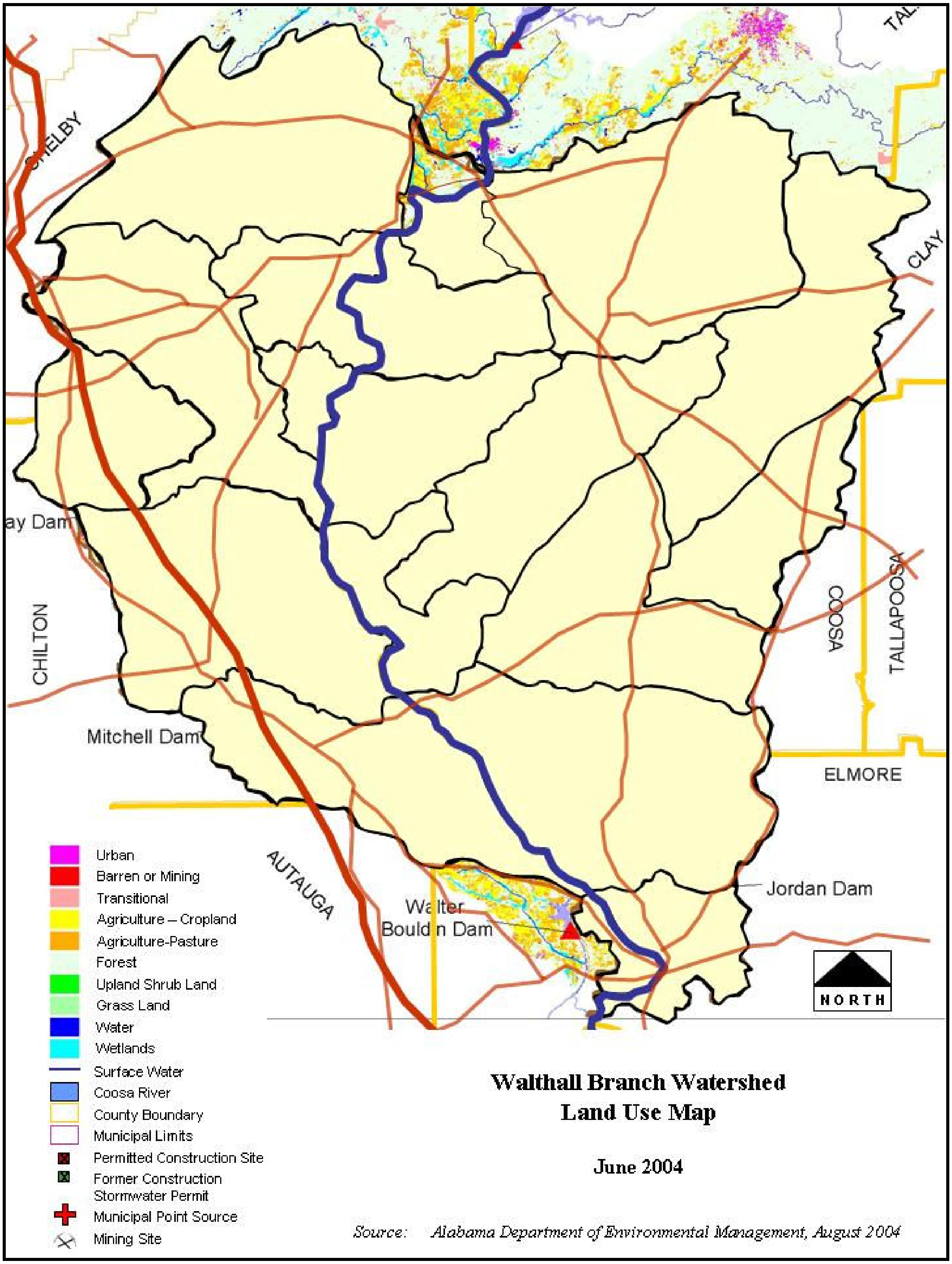
Suitability for Development................................. Good

2005 Priority Watershed Rating............................ High

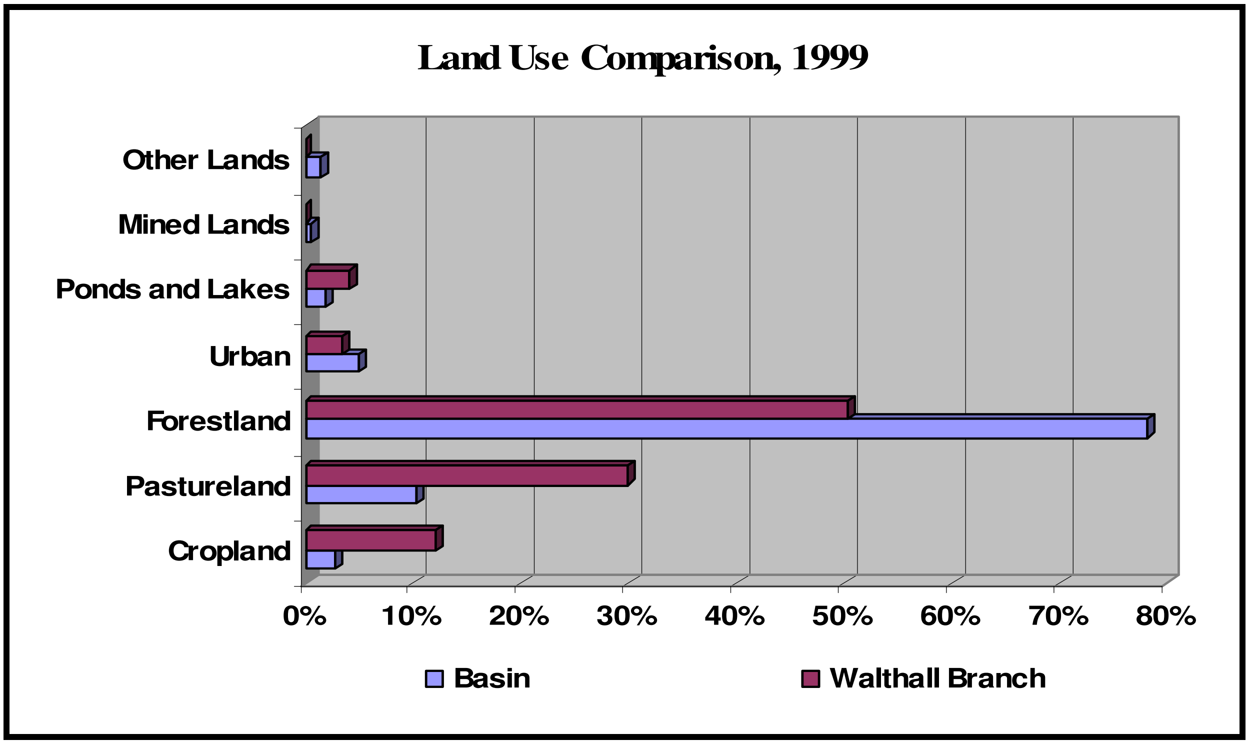
Major Contributing Factors

- Impaired Waterbodies
- ADEM Assessment Rating for Nonpoint Source Pollution
- Alabama Water Watch Water Quality Monitoring and Results
- Potential for Silviculture
- Sediment Loads
- Animal Density
- Growth Rate of County
- Housing Density
- Septic System Density

Land Use – 020



SHELBY
CLAY
ay Dam
CHILTON
Mitchell Dam
COOSA
TALLAPOOSA
ELMORE
AUTAUGA
Walter Bouldin Dam
Jordan Dam
NORTH
Urban
Barren or Mining
Transitional
Agriculture – Cropland
Agriculture-Pasture
Forest
Upland Shrub Land
Grass Land
Water
Wetlands
Surface Water
Coosa River
County Boundary
Municipal Limits
Permitted Construction Site
Former Construction Stormwater Permit
Municipal Point Source
Mining Site
Walthall Branch Watershed
Land Use Map
June 2004
Source: Alabama Department of Environmental Management, August 2004



Land Use Patterns

The Walthall Branch watershed has an agricultural character, with 42 percent of the land in agricultural land uses, as compared with 13 percent of the land in the Lower Coosa River Basin. The majority of the agricultural land is pasture land, at 30 percent, used for raising cattle. The remaining 12 percent of the agricultural land is used for crop production. The majority of the agricultural land is located in the western half of the watershed. The eastern half of the watershed is characterized by forest land which comprises 50 percent of the total land use in the watershed. Only 10 percent of the forest land is of a deciduous type, while the remaining 40 percent is mixed forest and evergreens, indicating a high probability of silviculture within the watershed. Further indications of silviculture include high sediment loads from dirt roads, road banks and woodlands. Only 3 percent of the land in the watershed is in urban land uses, most of which are located in the upper northwest corner of the watershed east of Harpersville. Sediment loads from urban uses, however, are high compared to the small amount of urban land at 6.97 tons per acre, which is the fourth highest in the Lower Coosa River Basin. There are approximately 200 septic systems in the watershed, which equates to about 43 acres per system.

Walthall Branch watershed is accessed by U.S. Highway 280 northwest to southeast across the northern part of the watershed and State Highway 76 running southwest to northeast across the central part of the watershed. State Highway 25 runs north-south just west of the watershed. While there are no traffic volume measurements within the watershed, between 1994 and 2002 traffic volume on U.S. Highway 280 increased 25.81 percent just west of the watershed and increased 27.29 percent at the eastern boundary showing significant growth of travelers into and through the watershed.

Soils and Species – 020

The Walthall Branch watershed is comprised of soils in two soil associations: the Decatur-Dewey-Allen Association and the Montevallo-Townley-Enders Association. The majority of the watershed, by far, is made up of soils in the Decatur-Dewey-Allen Association. Only the very southern tip of the watershed is in the Montevallo-Townley-Enders Association. The soil suitability and limitations for selected uses are provided in the table below. For a map of the soil associations in the watershed and in the Lower Coosa River Basin, refer to the Soil Association Map on page 9.

Soil Association Number	6	16
Soil Association	**Decatur-Dewey-Allen**	**Montevallo-Townley-Enders**
Dominant Slope, %	1 - 10	6 - 40
Soil Suitability and Major Limitations For:		
Cropland	Good	Poor: slope, depth to rock
Pastureland	Good	Poor: slope, droughty
Woodland	Good	Poor: depth to rock
Soil Limitations For:		
Septic Systems	Slight	Severe: depth to rock, slope
Local Roads and Streets	Moderate: low strength	Severe: slope
Small Commercial Buildings	Moderate	Severe: slope
Dwellings without Basements	Moderate	Severe: slope
Camp Areas	Slight	Severe: slope
Picnic Areas	Slight	Severe: slope
Playgrounds	Slight	Severe: slope, depth to rock
Paths and Trails	Slight	Severe: slope

The Walthall Branch watershed is located in one Level III Ecoregion: the Ridge and Valley. The Level IV Sub-Ecoregion in which the watershed lies is the Southern Limestone / Dolomite Valleys and Low Rolling Hills. In addition to the protected species found throughout the Lower Coosa River Basin (listed on page 14), the following protected species are found in the Walthall Branch watershed.

Common Name	Scientific Name	Distribution in Lower Coosa River Basin
Coldwater Darter	*Etheostoma ditrema*	(1) Spring-dwelling race-Shelby to Coosa Counties (2) Stream race-Waxahatchee Creek tribs, Shelby County; Coosa River tribs, Coosa County
Dusky Gopher Frog	*Rana capito sevosa*	Shelby County
Appalachian Bewick's wren	*Thryomanes bewickii altus*	North of the Fall Line, particularly in Ridge and Valley province
Mud Elimia	*Elimia alabamensis*	Shelby, Talladega, Chilton, Coosa Counties
Upland Hornsnail	*Pleurocera showalteri*	Shelby and Talladega Counties
Shoals Spiderlily	*Hymenoccallis coronaria*	Shelby County
Running Post Oak	*Quercus boyntonii*	Ridge and Valley Province of Shelby County

Demographics – 020

Population - Urban / Rural	Number	Percent
Total Population	798	100.00%
Urban	0	0.00%
Rural	798	100.00%
Farm	24	3.01%
Nonfarm	774	96.99%

Population By Race	Number	Percent
Total Population	798	100.00%
White	476	59.65%
Black	321	40.23%
American Indian / Alaskan	0	0.00%
Asian	0	0.00%
Native Hawaiian / Pacific Isl.	0	0.00%
Some Other Race	0	0.00%
Two or More Races	1	0.13%

Population By Age	Number	Percent
Total Population	798	100.00%
Under 18	215	26.88%
18 to 29 Years	140	17.54%
30 to 49 Years	225	28.13%
50 to 64 Years	103	12.91%
65 Years and Older	116	14.54%

Population in Households	Number	Percent
Total Population	798	100.00%
Population In households	791	99.12%
In Family Households	725	91.59%
In NonFamily Households	67	8.41%
In Group Quarters	7	0.88%
Institutionalized	7	100.00%
Noninstitutionalized	0	0.00%

Educational Attainment	Number	Percent
Total Population (25 & Over)	500	100.00%
No schooling completed	3	0.60%
Some School, No Diploma	147	29.30%
High School Graduate, GED	187	37.30%
Some College, No Degree	94	18.80%
Associate degree	29	5.80%
Bachelor's degree	30	6.00%
Master's degree	6	1.20%
Professional school degree	1	0.20%
Doctorate degree	4	0.80%

Place of Birth	Number	Percent
Total	798	100.00%
Native	797	99.87%
Born in Alabama	702	88.08%
Born in Northeast	11	1.38%
Born in Midwest	36	4.52%
Born in South	46	5.71%
Born in West	3	0.31%
Born outside US	0	0.00%
Foreign Born	1	0.13%
Naturalized citizen	1	100.00%
Not a citizen	0	0.00%

Residence in 1995	Number	Percent
Total Population (5 and Over)	741	100.00%
Same house in 1995	464	62.55%
Different house in 1995	278	37.45%
In United States in 1995	275	98.92%
Same County	151	54.83%
Different county	124	45.17%
Different county; Same state	99	36.07%
Different state	25	9.11%
Different state; Northeast	2	6.00%
Different state; Midwest	9	34.00%
Different state; South	11	42.00%
Different state; West	5	18.00%
Elsewhere	3	1.08%

Economics and Employment – 020

Median Family Income, 1999	$34,861
Median Household Income, 1999	$30,556
Median Per Capita Income, 1999	$12,971

Employment Status	Number	Percent
Population (16 and over)	612	100.00%
In labor force	354	57.76%
In Armed Forces	0	0.00%
Civilian	354	100.00%
Civilian; Employed	333	94.20%
Civilian; Unemployed	21	5.80%
Not in labor force	259	42.24%

Place of Work	Number	Percent
Workers (16 and over)	327	100.00%
Worked in Alabama	325	99.54%
In county of residence	178	54.77%
Outside county of residence	147	45.23%
Worked outside Alabama	2	0.46%

Transportation To Work	Number	Percent
Workers (16 and Over)	327	100.00%
Car; truck; or van	310	94.79%
Drove alone	235	75.93%
Carpooled	75	24.07%
Public transportation	0	0.00%
Motorcycle	0	0.00%
Bicycle	0	0.00%
Walked	5	1.53%
Other means	7	2.14%
Worked at home	5	1.53%

Travel Time to Work	Number	Percent
Workers (16 and over)	327	100.00%
Did Not Work at Home	322	98.47%
Less than 5 minutes	0	0.00%
5 to 9 minutes	30	9.33%
10 to 14 minutes	34	10.42%
15 to 19 minutes	39	11.98%
20 to 24 minutes	26	8.09%
25 to 29 minutes	25	7.78%
30 to 34 minutes	73	22.71%
35 to 39 minutes	13	4.04%
40 to 44 minutes	4	1.09%
45 to 59 minutes	40	12.29%
60 to 89 minutes	29	9.02%
90 or more minutes	11	3.27%
Worked at Home	5	1.53%

Employment By Industry	Number	Percent
Employed, 16 and Over	333	100.00%
Agri; Forestry; Fish/Hunt	16	4.65%
Mining	0	0.00%
Construction	38	11.41%
Manufacturing	89	26.73%
Wholesale Trade	31	9.16%
Retail Trade	32	9.46%
Transportation/Warehousing	4	1.20%
Utilities	7	2.10%
Information	4	1.20%
Finance and Insurance	7	2.10%
Real Estate	4	1.05%
Prof; Scientific; Tech Svcs	7	2.10%
Mgmt of Companies/Ent	0	0.00%
Admin; Waste Mgmt Svcs	3	0.75%
Educational Services	21	6.16%
Health Care/Social Assist.	24	7.06%
Arts; Entertainment; Rec	3	0.90%
Accommodation/Food Svcs	17	4.95%
Public Administration	14	4.20%
Other Services	16	4.80%

Housing – 020

Median Year Structure Built	1975

Housing	Number	Percent
Total Housing Units	324	100.00%
Urban	0	0.00%
Rural	324	100.00%

Housing Occupancy	Number	Percent
Total	324	100.00%
Occupied	290	89.50%
Owner Occupied	239	82.38%
Renter Occupied	51	17.62%
Vacant	34	10.50%
For Rent	6	17.39%
For Sale Only	6	17.39%
Rented or Sold;	0	0.00%
For Seasonal Use	6	17.39%
For Migrant Workers	0	0.00%
Other vacant	16	47.83%

Household Size	Number	Percent
Total Occupied Housing Units	290	100.00%
1-person household	58	20.03%
2-person household	88	30.40%
3-person household	55	18.83%
4-person household	52	17.96%
5-person household	26	8.81%
6-person household	5	1.55%
7-or-more-person household	7	2.42%

Average Household Size	# Persons
All Housing Units	2.73
Owner occupied	2.75
Renter occupied	2.63

Units & Rooms in Structure	Number	Percent
Housing units: Total	324	100.00%
1 Unit - Detached	198	61.11%
1 Unit - Attached	3	0.93%
2 units in structure	4	1.08%
3 or 4 units in structure	0	0.00%
5 to 9 units in structure	0	0.00%
10 to 19 units in structure	0	0.00%
20 to 49 units in structure	0	0.00%
50 or more units in structure	0	0.00%
Mobile home	120	36.88%
Boat; RV; van; etc.	0	0.00%
Median number of rooms		5.30

House Heating Fuel	Number	Percent
Total Occupied Housing Units	290	100.00%
Utility gas	59	20.21%
Bottled; tank; or LP gas	94	32.30%
Electricity	118	40.76%
Fuel oil; kerosene; etc.	7	2.25%
Coal or coke	0	0.00%
Wood	10	3.45%
Solar energy	0	0.00%
Other fuel	0	0.00%
No fuel used	3	1.04%

Telephone Service	Number	Percent
Total Occupied Housing Units	290	100.00%
Telephone Service Available	274	94.48%
No Telephone Service Available	16	5.52%

Vehicles Available	Number	Percent
Total Occupied Housing Units	290	100.00%
No vehicle available	19	6.39%
1 vehicle available	101	34.72%
2 vehicles available	101	34.72%
3 vehicles available	49	16.75%
4 vehicles available	14	4.84%
5 or more vehicles available	8	2.59%

Plumbing Facilities	Number	Percent
Total Housing Units	324	100.00%
Complete plumbing facilities	317	97.84%
Lacking complete plumbing facilities	7	2.16%

Kitchen Facilities	Number	Percent
Total Housing Units	324	100.00%
Complete kitchen facilities	319	98.46%
Lacking complete kitchen facilities	5	1.54%

Rating and Issues – 020

Criteria	Rating
Impaired Water Bodies	5
ADEM Basin Assessment Rating for NPS Potential	5
NRCS Priority Watershed	1
AWW Water Quality Monitoring and Results	5
Use Classification	3
Land Use Character	3
Potential for Silviculture	5
Sediment Loads	5
Animal Density	5
Soil Suitability for Development	1
Growth Rate of County	5
Increase in Traffic Volume	3
Number of Permitted Dischargers	1
Presence of Hydroelectric Dam	1
Housing Density	5
Septic System Density	5
Number of Endangered Species	4
2000 Unemployment Rate	3
Total	**65 High**

With a rating score of 65, the Walthall Branch watershed is considered to be a high priority watershed in the Lower Coosa River Basin. For more information on the watershed rating and ranking system, refer to *the Lower Coosa River Basin Management Plan*, Part IV, Chapter 12: Priority Watersheds.

A total of 23 issues were identified in the Lower Coosa River Basin. Of these, 12 are present in the Walthall Branch watershed, of which five are basinwide issues, six are regional issues and one is a local concern. The focus of the regional watershed management measures for this watershed is managing urban growth and development and mitigating stormwater runoff.

Refer to the Lower Coosa River Basin Management Plan, Part IV, Chapter 14: Water Quality Improvement Strategy for management measures that may be implemented in this watershed.

Basinwide Issues:
- Endangered Species
- Lack of Water Quality Trend Data
- Illegal Dumping
- Lack of Education and Awareness
- FERC Relicensing of Hydroelectric Facilities

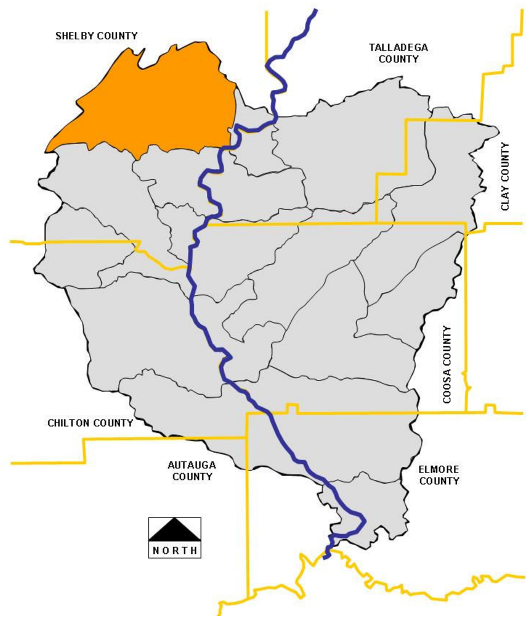
Regional Issues:
- Growth Rate and Urban Development
- Agricultural Runoff
- Urban Runoff
- Sedimentation
- Low Dissolved Oxygen
- Priority Organics

Local Concerns:
- Point Source Discharges

Yellowleaf Creek Watershed
HUC: 03150107-030

Watershed Area:	118,484 ac.
Percent of Basin:	9.47%
Type:	Agricultural/Urban
County-Headwaters:	Shelby
County-Mouth:	Shelby
Municipalities:	Chelsea Pelham
Total Population:	12,041
Percent of Basin:	10.98%
Land Use	
Lakes and Ponds	950 ac
Cropland	5,250 ac
Pastureland	19,500 ac
Forestland	83,550 ac
Urbanized	7,600 ac
Mined Land	47 ac
Other Land	1,587 ac
Animal Data	
Cattle	2,940
Dairy	0
Swine	0
Broilers	0
Layers	0
Catfish Acres	20
Domestic Water Data	
Septic Tanks	3,000
Failing Septic Tanks	150
Alternative Systems	90
Sediment Loads (in tons)	
Total	697,195
Cropland	14,175
Sand & Gravel Pits	16,450
Mined Land	12,060
Developing Urban Land	456,000
Gullies	0
Critical Areas	157,500
Streambanks	840
Dirt Roads and Banks	15,000
Woodland	25,170
Water Users	
Public Water Supply	0
Total Permitted Dischargers	22
Municipal	3
Industrial	19
Mining	0

Yellowleaf Creek Watershed Location Map



Impaired Water Bodies..None

Active Water Quality Monitoring Sites........................ 1

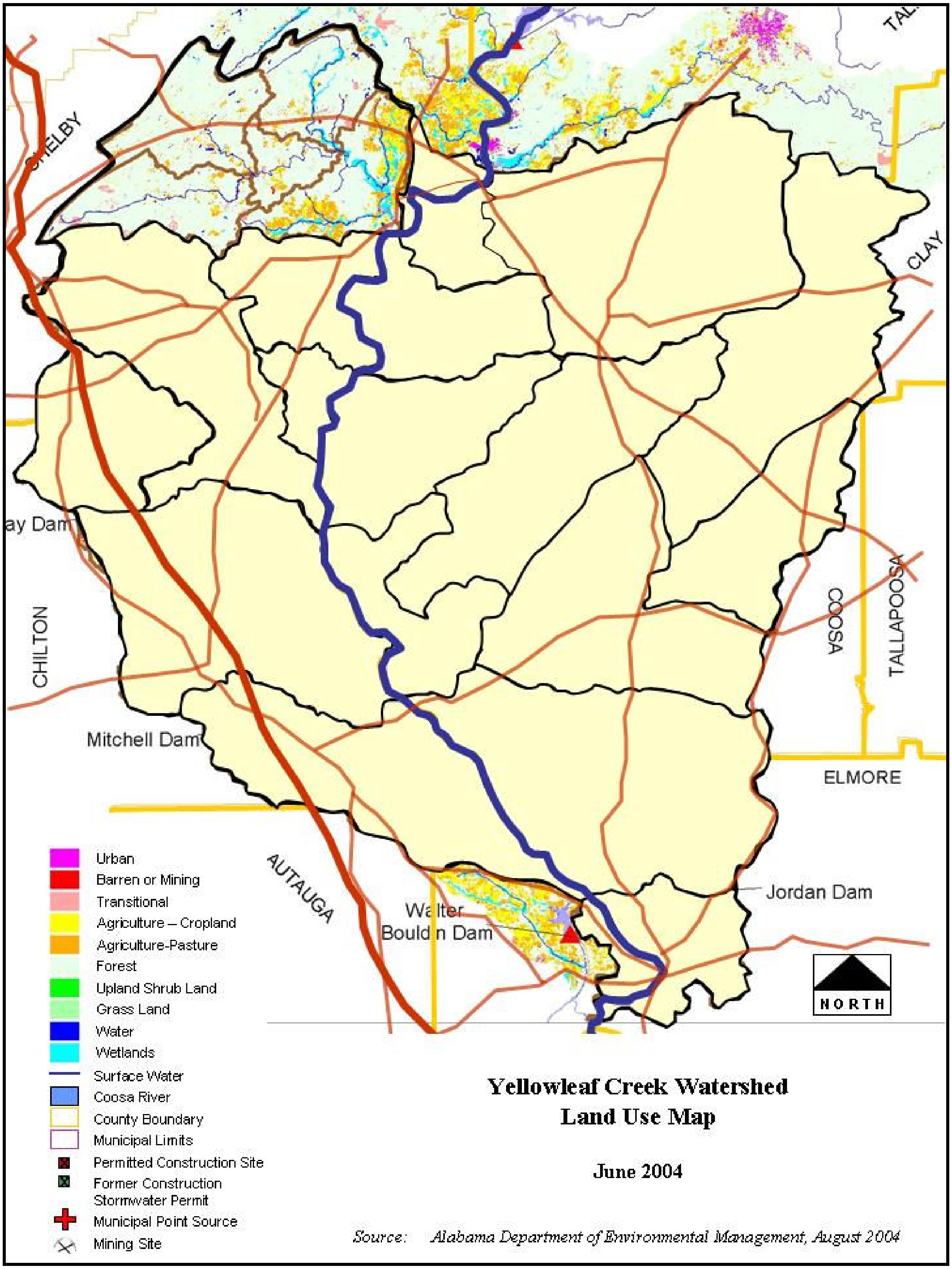
Suitability for Development...................................Poor

2005 Priority Watershed Rating............................. High

Major Contributing Factors

- Alabama Water Watch Water Quality Monitoring and Results
- Use Classification
- Growth Rate of County
- Increase in Traffic Volume
- Housing Density
- Septic System Density

Land Use – 030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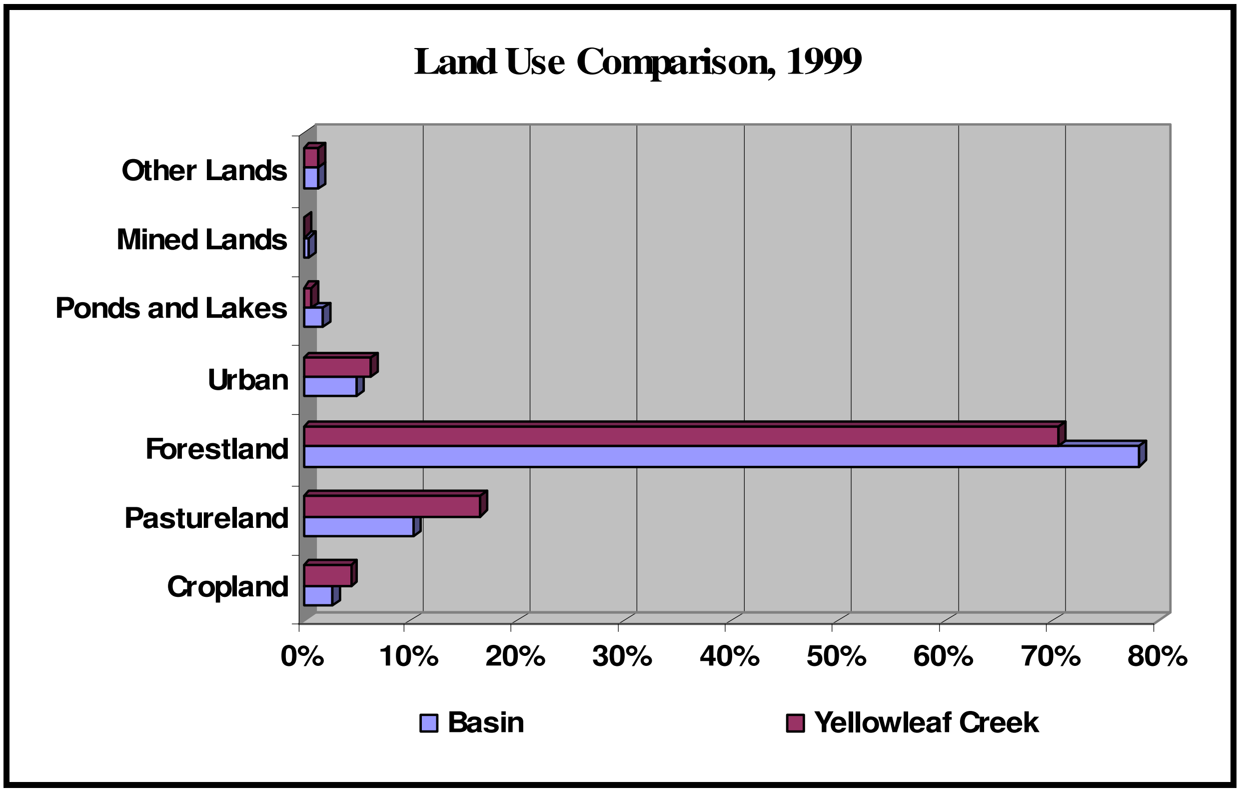
Mitchell Dam
ELMORE
AUTAUGA
Walter Bouldin Dam
Jordan Dam
NORTH
Urban
Barren or Mining
Transitional
Agriculture – Cropland
Agriculture-Pasture
Forest
Upland Shrub Land
Grass Land
Water
Wetlands
Surface Water
Coosa River
County Boundary
Municipal Limits
Permitted Construction Site
Former Construction Stormwater Permit
Municipal Point Source
Mining Site
Yellowleaf Creek Watershed
Land Use Map
June 2004
Source: Alabama Department of Environmental Management, August 2004



Land Use Patterns

The Yellowleaf Creek watershed is both agricultural and urban in character. Agricultural land comprises 20 percent of the watershed land area, as compared to 13 percent of the entire basin being in agricultural use. Concentrations of agricultural land uses are found in the southeastern part of the watershed and more sporadic agricultural uses are located in the central part. Of the total agricultural land, 16 percent is used for pasture land, mostly for raising cattle, and 4 percent is used for crop land. It is estimated that the watershed produces 0.12 tons per acre of cropland sediment, which is the third highest in the basin. Urban land uses make up 6 percent of the total land uses, with 7,600 acres of urban land. Urban land uses are located throughout the watershed with medium concentrations in the Chelsea and Pelham areas and along U.S. Highway 280 in the western half of the basin. The western half of the watershed has experienced significant growth as evidenced by the number of stormwater permits that have been issued in the watershed. It is estimated that the watershed produces 3.85 tons per acre of urban sediment. It is also estimated that 5 percent of the 3,000 septic systems in the watershed are failing. Forests occupy most of land in the watershed at 68 percent of the total land. Of the land in forest use, 40.51 percent is a deciduous type forest and 59.49 is mixed forest and evergreen forest, which are most often used for silviculture purposes. This equates to approximately 49,703 acres of timberland. Forested land is found throughout the watershed, however, concentrations are higher in the central part. The Yellowleaf Creek watershed is accessed by two major roads. U.S. Highway 280 runs northwest-southeast across the northern part of the watershed. State Highway 25 runs north-south along the eastern watershed boundary. Traffic volume on both roads increased between 1994 and 2002, with increases ranging from a 16.61 percent increase on Highway 25 near Wilsonville to a 54.05 percent increase on U.S. Highway 280, northwest of Chelsea.

Soils and Species – 030

The Yellowleaf Creek watershed is comprised of soils in three soil associations: the Decatur-Dewey-Allen Association, the Hector-Rockland, limestone-Allen Association and the Montevello-Townley-Enders Association. The Montevallo-Townley-Enders Association is the predominant soil group and occupies the entire central part of the watershed. The Decatur-Dewey-Allen Association is found along the eastern and southeastern boundary. A very small area along the western boundary is comprised of soils in the Hector-Rockland, limestone-Allen Association. The soil suitability and limitations for selected uses are provided in the table below. For a map of the soil associations in the watershed and in the Lower Coosa River Basin, refer to the Soil Association Map on page 9.

Soil Association Number	6	15	16
Soil Association	**Decatur-Dewey-Allen**	**Hector-Rockland, limestone-Allen**	**Montevallo-Townley-Enders**
Dominant Slope, %	1 - 10	25 - 40	6 - 40
Soil Suitability and Major Limitations For:			
Cropland	Good	Poor: slope, depth to rock	Poor: slope, depth to rock
Pastureland	Good	Poor: slope, droughty	Poor: slope, droughty
Woodland	Good	Poor: depth to rock	Poor: depth to rock
Soil Limitations For:			
Septic Systems	Slight	Severe: depth to rock, slope	Severe: depth to rock, slope
Local Roads and Streets	Moderate: low strength	Severe: depth to rock, slope	Severe: slope
Small Commercial Buildings	Moderate	Severe: depth to rock, slope	Severe: slope
Dwellings without Basements	Moderate	Severe: depth to rock, slope	Severe: slope
Camp Areas	Slight	Severe: slope	Severe: slope
Picnic Areas	Slight	Severe: slope	Severe: slope
Playgrounds	Slight	Severe: slope, depth to rock	Severe: slope, depth to rock
Paths and Trails	Slight	Severe: slope	Severe: slope

The Yellowleaf Creek watershed is located in one Level III Ecoregion: the Ridge and Valley. The watershed contains portions of three sub-ecoregions of the Ridge and Valley Ecoregion. In addition to the protected species found throughout the Lower Coosa River Basin (listed on page 14), the following protected species are found in the Yellowleaf Creek watershed.

Common Name	Scientific Name	Distribution in Lower Coosa River Basin
Coldwater Darter	*Etheostoma ditrema*	(1) Spring-dwelling race-Shelby to Coosa Counties (2) Stream race-Waxahatchee Creek tribs, Shelby County; Coosa River tribs, Coosa County
Dusky Gopher Frog	*Rana capito sevosa*	Shelby County
Appalachian Bewick's wren	*Thryomanes bewickii altus*	North of the Fall Line, particularly in Ridge and Valley province
Fine-lined Pocketbook	*Lampsilis altilis*	Yellowleaf Creek, Shelby County; Tallaseehatchee Creek, Talladega and Clay Counties
Mud Elimia	*Elimia alabamensis*	Shelby, Talladega, Chilton, Coosa Counties
Walnut Elimia	*Elimia beluga*	Yellowleaf Creek, Shelby County
Banded Elimia	*Elimia fascias*	Yellowleaf Creek, Shelby County
Golden Pebblesnail	*Somoatogyrus bureaus*	Yellowleaf Creek, Shelby County
Shoals Spiderlily	*Hymenoccallis coronaria*	Shelby County
Running Post Oak	*Quercus boyntonii*	Ridge and Valley Province of Shelby County

Demographics – 030

Population - Urban / Rural	Number	Percent
Total Population	12,041	100.00%
Urban	773	6.42%
Rural	11,268	93.58%
Farm	123	1.09%
Nonfarm	11,145	98.91%

Population By Race	Number	Percent
Total Population	12,041	99.84%
White	11,527	95.73%
Black	309	2.57%
American Indian / Alaskan	43	0.36%
Asian	22	0.02%
Native Hawaiian / Pacific Isl.	0	0.00%
Some Other Race	46	0.38%
Two or More Races	94	0.78%

Population By Age	Number	Percent
Total Population	12,041	100.00%
Under 18	3,122	25.93%
18 to 29 Years	1,599	13.28%
30 to 49 Years	4,075	33.84%
50 to 64 Years	2,061	17.11%
65 Years and Older	1,184	9.83%

Population in Households	Number	Percent
Total Population	12,041	100.00%
Population In households	11,877	98.64%
In Family Households	10,828	91.17%
In NonFamily Households	1,049	8.83%
In Group Quarters	164	1.36%
Institutionalized	125	76.14%
Noninstitutionalized	39	23.86%

Educational Attainment	Number	Percent
Total Population (25 & Over)	8,046	100.00%
No schooling completed	83	1.03%
Some School, No Diploma	1,780	22.13%
High School Graduate, GED	2,443	30.36%
Some College, No Degree	1,523	18.93%
Associate degree	401	4.98%
Bachelor's degree	1,176	14.61%
Master's degree	410	5.10%
Professional school degree	167	2.08%
Doctorate degree	63	0.79%

Place of Birth	Number	Percent
Total	12,041	100.00%
Native	11,933	99.10%
Born in Alabama	9,024	75.62%
Born in Northeast	306	2.56%
Born in Midwest	661	5.54%
Born in South	1,618	13.56%
Born in West	245	2.06%
Born outside US	79	0.66%
Foreign Born	108	0.90%
Naturalized citizen	62	57.24%
Not a citizen	46	42.76%

Residence in 1995	Number	Percent
Total Population (5 and Over)	11,207	100.00%
Same house in 1995	5,717	51.02%
Different house in 1995	5,489	48.98%
In United States in 1995	5,428	98.88%
Same County	2,422	44.62%
Different county	3,006	55.38%
Different county; Same state	2,030	37.40%
Different state	976	17.99%
Different state; Northeast	36	3.70%
Different state; Midwest	157	16.08%
Different state; South	688	70.45%
Different state; West	95	9.77%
Elsewhere	62	1.12%

Economics and Employment – 030

Median Family Income, 1999	$57,613
Median Household Income, 1999	$43,818
Median Per Capita Income, 1999	$24,776

Employment Status	Number	Percent
Population (16 and over)	9,290	100.00%
In labor force	6,042	65.04%
In Armed Forces	9	0.15%
Civilian	6,033	99.85%
Civilian; Employed	5,865	97.22%
Civilian; Unemployed	168	2.78%
Not in labor force	3,248	34.96%

Place of Work	Number	Percent
Workers (16 and over)	5,782	100.00%
Worked in Alabama	5,730	99.10%
In county of residence	2,810	49.04%
Outside county of residence	2,920	50.96%
Worked outside Alabama	52	0.90%

Transportation To Work	Number	Percent
Workers (16 and Over)	5,782	100.00%
Car; truck; or van	5,501	95.14%
Drove alone	4,917	89.38%
Carpooled	584	10.62%
Public transportation	14	0.23%
Motorcycle	7	0.12%
Bicycle	0	0.00%
Walked	65	1.13%
Other means	28	0.49%
Worked at home	167	2.89%

Travel Time to Work	Number	Percent
Total Workers (16 and over)	5,782	100.00%
Did Not Work at Home	5,615	97.11%
Less than 5 minutes	152	2.70%
5 to 9 minutes	302	5.37%
10 to 14 minutes	381	6.78%
15 to 19 minutes	707	12.58%
20 to 24 minutes	655	11.67%
25 to 29 minutes	409	7.29%
30 to 34 minutes	1,084	19.31%
35 to 39 minutes	286	5.10%
40 to 44 minutes	342	6.09%
45 to 59 minutes	820	14.60%
60 to 89 minutes	336	5.98%
90 or more minutes	142	2.53%
Worked at Home	167	2.89%

Employment By Industry	Number	Percent
Employed, 16 and Over	5,865	100.00%
Agri; Forestry; Fish/Hunt	44	0.75%
Mining	7	0.11%
Construction	794	13.53%
Manufacturing	666	11.36%
Wholesale Trade	207	3.53%
Retail Trade	701	11.95%
Transportation/Warehousing	178	3.04%
Utilities	179	3.06%
Information	228	3.88%
Finance and Insurance	444	7.58%
Real Estate	95	1.62%
Prof; Scientific; Tech Svcs	362	6.17%
Mgmt of Companies/Ent	16	0.28%
Admin; Waste Mgmt Svcs	134	2.28%
Educational Services	421	7.17%
Health Care/Social Assist.	542	9.24%
Arts; Entertainment; Rec	101	1.72%
Accommodation/Food Svcs	223	3.80%
Public Administration	213	3.62%
Other Services	312	5.32%

Housing – 030

Median Year Structure Built		1986

Housing	Number	Percent
Total Housing Units	4,907	100.00%
Urban	328	6.68%
Rural	4,579	93.32%

Housing Occupancy	Number	Percent
Total	4,907	100.00%
Occupied	4,482	91.34%
Owner Occupied	3,851	85.93%
Renter Occupied	631	14.07%
Vacant	425	8.66%
For Rent	67	15.65%
For Sale Only	86	20.33%
Rented or Sold;	53	12.42%
For Seasonal Use	70	16.57%
For Migrant Workers	0	0.00%
Other vacant	149	35.03%

Household Size	Number	Percent
Total Occupied Housing Units	4,482	100.00%
1-person household	835	18.62%
2-person household	1,659	37.02%
3-person household	870	19.41%
4-person household	761	16.99%
5-person household	264	5.88%
6-person household	53	1.19%
7-or-more-person household	40	0.89%

Average Household Size	# Persons
All Housing Units	2.56
Owner occupied	2.61
Renter occupied	2.18

Units & Rooms in Structure	Number	Percent
Housing units: Total	4,907	100.00%
1 Unit - Detached	3,167	64.54%
1 Unit - Attached	59	1.20%
2 units in structure	18	0.36%
3 or 4 units in structure	46	0.93%
5 to 9 units in structure	48	0.97%
10 to 19 units in structure	28	0.57%
20 to 49 units in structure	2	0.05%
50 or more units in structure	15	0.31%
Mobile home	1,522	31.01%
Boat; RV; van; etc.	3	0.06%
Median number of rooms		5.77

House Heating Fuel	Number	Percent
Total Occupied Housing Units	4,482	100.00%
Utility gas	969	21.63%
Bottled; tank; or LP gas	1,200	26.78%
Electricity	2,168	48.38%
Fuel oil; kerosene; etc.	22	0.48%
Coal or coke	0	0.00%
Wood	104	2.32%
Solar energy	0	0.00%
Other fuel	12	0.27%
No fuel used	7	0.15%

Telephone Service	Number	Percent
Total Occupied Housing Units	4,482	100.00%
Telephone Service Available	4,412	98.44%
No Telephone Service Available	70	1.56%

Vehicles Available	Number	Percent
Total Occupied Housing Units	4,482	100.00%
No vehicle available	208	4.64%
1 vehicle available	1,071	23.89%
2 vehicles available	1,979	44.15%
3 vehicles available	870	19.41%
4 vehicles available	234	5.21%
5 or more vehicles available	121	2.70%

Plumbing Facilities	Number	Percent
Total Housing Units	4,907	100.00%
Complete plumbing facilities	4,863	99.12%
Lacking complete plumbing facilities	43	0.88%

Kitchen Facilities	Number	Percent
Total Housing Units	4,907	100.00%
Complete kitchen facilities	4,863	99.11%
Lacking complete kitchen facilities	44	0.89%

Rating and Issues – 030

Criteria	Rating
Impaired Water Bodies	1
ADEM Basin Assessment Rating for NPS Potential	1
NRCS Priority Watershed	1
AWW Water Quality Monitoring and Results	5
Use Classification	5
Land Use Character	4
Potential for Silviculture	4
Sediment Loads	3
Animal Density	3
Soil Suitability for Development	4
Growth Rate of County	5
Increase in Traffic Volume	5
Number of Permitted Dischargers	4
Presence of Hydroelectric Dam	1
Housing Density	5
Septic System Density	5
Number of Endangered Species	4
2000 Unemployment Rate	2
Total	**62 High**

With a rating score of 62, the Yellowleaf Creek watershed is considered to be a high priority watershed in the Lower Coosa River Basin. For more information on the watershed rating and ranking system, refer to the *Lower Coosa River Basin Management Plan*, Part IV, Chapter 12: Priority Watersheds.

A total of 23 issues were identified in the Lower Coosa River Basin. Of these, 11 are present in the Yellowleaf Creek watershed, of which five are basinwide issues and six are regional issues. The focus of the regional watershed management measures for this watershed is managing urban growth and development and protection of aquatic habitats.

Refer to the Lower Coosa River Basin Management Plan, Part IV, Chapter 14: Water Quality Improvement Strategy for management measures that may be implemented in this watershed.

Basinwide Issues:
- Endangered Species
- Lack of Water Quality Trend Data
- Illegal Dumping
- Lack of Education and Awareness
- FERC Relicensing of Hydroelectric Facilities

Regional Issues:
- Compliance with the Recovery Plan for the Mobile Basin Aquatic Ecosystem
- Designation as a Critical Habitat
- Growth Rate and Urban Development
- Agricultural Runoff
- Urban Runoff
- Sedimentation

Kahatchee Creek Watershed
HUC: 03150107-040

Watershed Area:	15,836 ac.
Percent of Basin:	1.27%
Type:	Urban
County-Headwaters:	Shelby
County-Mouth:	Shelby
Municipalities:	Columbiana Wilsonville
Total Population:	2,704
Percent of Basin:	2.46

Land Use

Lakes and Ponds	1,109 ac
Cropland	633 ac
Pastureland	2,375 ac
Forestland	8,552 ac
Urbanized	2,375 ac
Mined Land	317 ac
Other Land	475 ac

Animal Data

Cattle	540
Dairy	0
Swine	8
Broilers	0
Layers	0
Catfish Acres	150

Domestic Water Data

Septic Tanks	0
Failing Septic Tanks	0
Alternative Systems	0

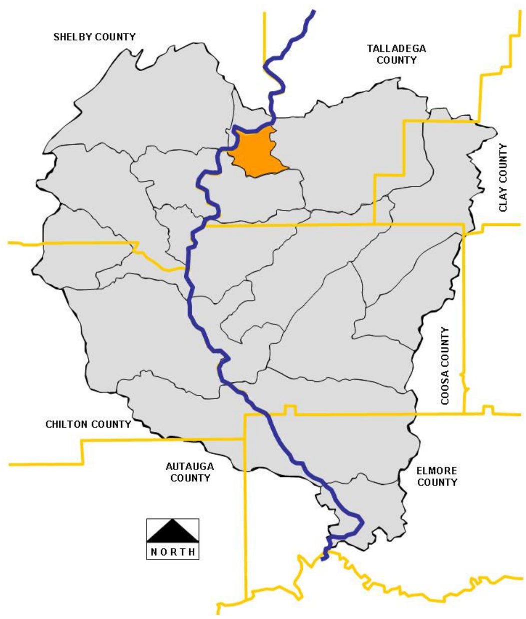
Sediment Loads (in tons)

Total	192,902
Cropland	1,329
Sand & Gravel Pits	14,000
Mined Land	9,000
Developing Urban Land	64,000
Gullies	17,500
Critical Areas	24,000
Streambanks	58,000
Dirt Roads and Banks	2,508
Woodland	2,565

Water Users

Public Water Supply	0
Total Permitted Dischargers	1
Municipal	1
Industrial	0
Mining	0

Kahatchee Creek Watershed Location Map



Impaired Water Bodies.................................. Lay Lake

Active Water Quality Monitoring Sites........................ 0

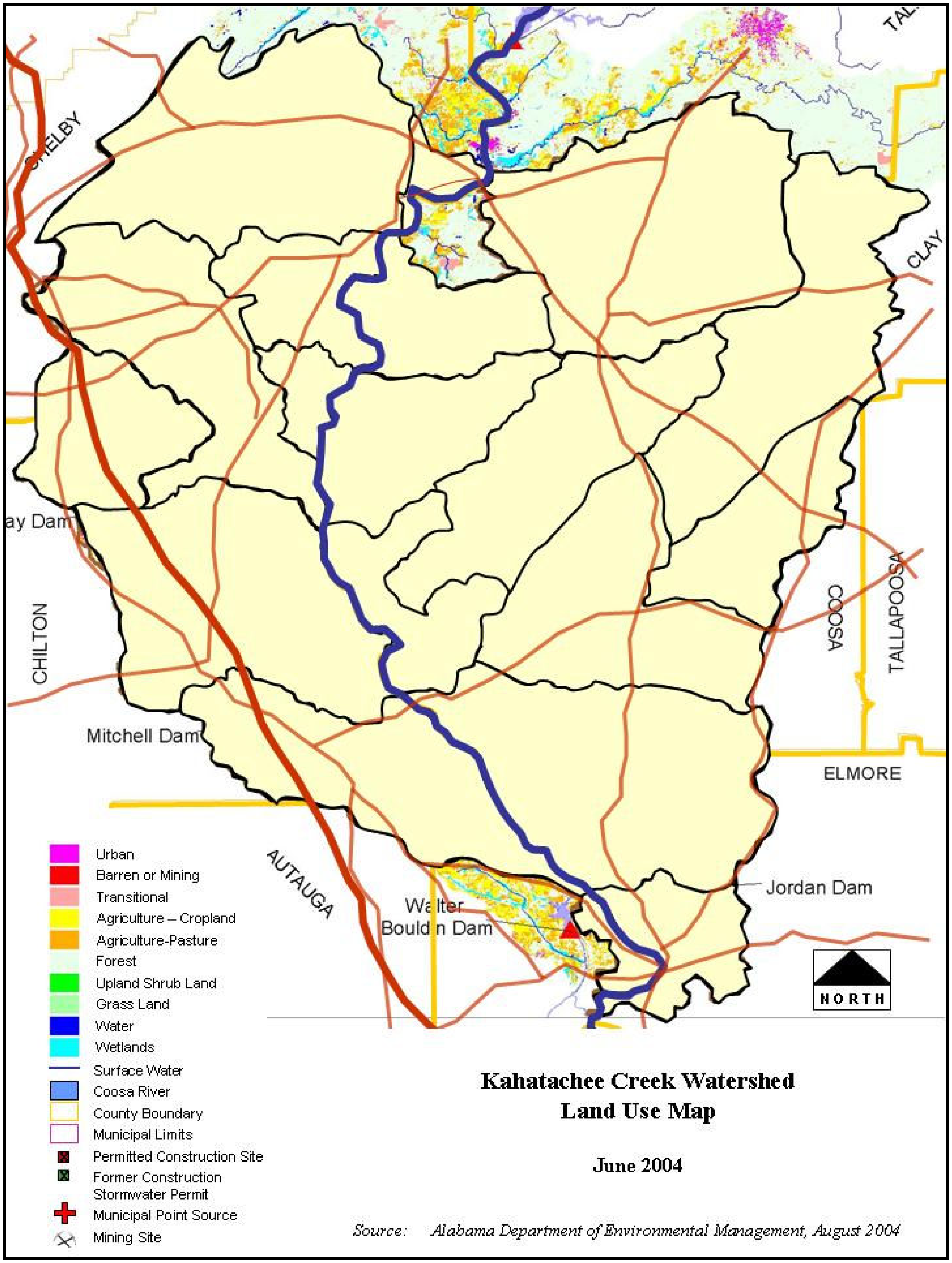
Suitability for Development...................................Poor

2005 Priority Watershed Rating............................. High

Major Contributing Factors

- Impaired Waterbodies
- ADEM Assessment Rating for Nonpoint Source Pollution
- Alabama Water Watch Water Quality Monitoring and Results
- Urban Land Uses
- Sediment Loads
- Soil Suitability for Development
- Housing Density
- 2000 Unemployment Rate

Land Use – 040



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Jordan Dam
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Barren or Mining
Transitional
Agriculture – Cropland
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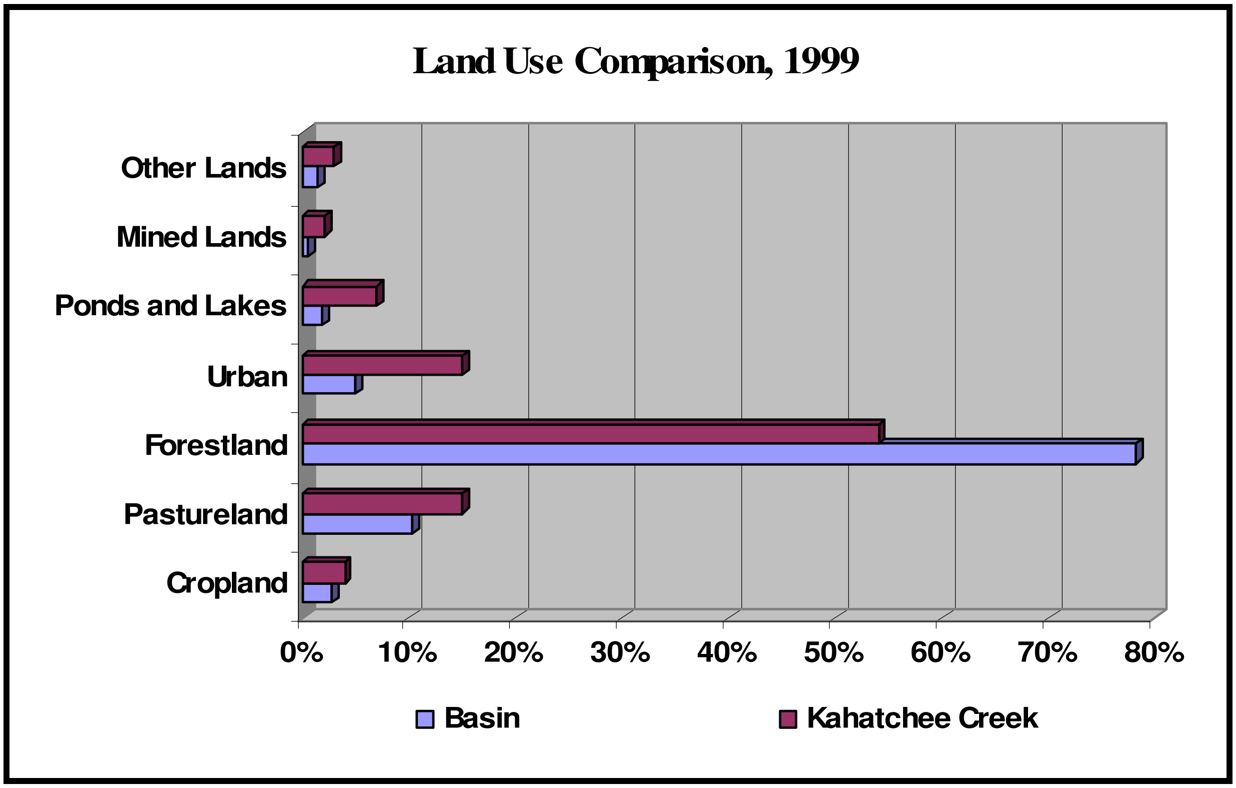
Municipal Limits
Permitted Construction Site
Former Construction Stormwater Permit
Municipal Point Source
Mining Site
Kahatachee Creek Watershed
Land Use Map
June 2004
Source: Alabama Department of Environmental Management, August 2004



Land Use Patterns

Overall, the Kahatchee Creek watershed has an urban character, with 15 percent of the land in urban land uses, as compared with 5 percent of the land in the Lower Coosa River. Urban land uses are primarily concentrated in the eastern part of the watershed southwest of Childersburg and west of the U.S. Highway 231 corridor. A small majority of the land in the watershed, at 54 percent, is forest land. The percentage of deciduous forest land in the watershed, at 38.41 percent, is slightly lower than that of the basin, at 40.58 percent. Mixed forest and evergreens comprise the remaining 61.59 percent of forest land, representing a high percentage of the forested land with existing or potential silviculture use. Forest land is mostly located in the eastern part of the watershed south of Childersburg and in the southwestern corner. Agricultural land encompasses 19 percent of the land area, of which 4 percent is crop land and 15 percent is pasture land. Although 15 percent of the agricultural land is pasture land, it is only estimated that there are 540 head of cattle and eight swine in the watershed. Agricultural land uses are found primarily in the western quarter of the watershed along the Coosa River and along Waters Branch and Kahatchee Creek. It is estimated that the Kahatchee Creek watershed produces 12.18 tons of sediment per acre, which is the fourth highest in the basin. Most of the sediment is from developing urban lands and stream banks.

There are no major roads providing access to the Kahatchee Creek watershed, although U.S. Highway 280 runs just east of the watershed. The intersection of U.S. Highway 231 and State Highway 76 is located just northeast of the watershed. Traffic volume along this portion of U.S. Highway 231 has maintained a slow growth pattern at an increase of 8.28 percent between 1994 and 2002.

Soils and Species – 040

The Kahatchee Creek watershed is comprised soils in two soil associations: the Chesham-Leesburg Association and the Tallapoosa-Tatum Association. The Cheaha-Leesburg Association is found in the north and central parts of the watershed. The Tallapoosa-Tatum Association is located primarily in the southeastern portion of the watershed. The soil suitability and limitations for selected uses are provided in the table below. For a map of the soil associations in the watershed and in the Lower Coosa River Basin, refer to the Soil Association Map on page 9.

Soil Association Number	**2**	**25**
Soil Association	**Cheaha-Leesburg**	**Tallapoosa-Tatum**
Dominant Slope, %	20 - 50	6 - 50
Soil Suitability and Major Limitations For:		
Cropland	Poor: slope, large stones	Poor: slope, droughty
Pastureland	Poor: slope	Poor: slope
Woodland	Good	Good
Soil Limitations For:		
Septic Systems	Severe: slope, depth to rock	Severe: slope, depth to bedrock
Local Roads and Streets	Severe: slope	Severe: slope
Small Commercial Buildings	Severe: slope	Severe: slope
Dwellings without Basements	Severe: slope	Severe: slope
Camp Areas	Severe: slope, large stones	Severe: slope
Picnic Areas	Severe: slope	Severe: slope
Playgrounds	Severe: slope, large stones	Severe: slope
Paths and Trails	Severe: slope, large stones	Severe: slope

The Kahatchee Creek watershed is located in the Ridge and Valley Level III. The watershed is subdivided two Level IV Ecoregions: the Southern Limestone / Dolomite Valleys and Low Rolling Hills and the Southern Dissected Ridges and Knobs. In addition to the protected species found throughout the Lower Coosa River Basin (listed on page 14), the following protected species are found in the Kahatchee Creek watershed.

Common Name	**Scientific Name**	**Distribution in Lower Coosa River Basin**
Appalachian Bewick's wren	*Thryomanes bewickii altus*	North of the Fall Line, particularly in Ridge and Valley province
Upland Hornsnail	*Pleurocera showalteri*	Shelby and Talladega Counties
Nevius Stonecrop	*Sedum nevii*	Chilton, Coosa, Talladega Counties

Demographics – 040

Population - Urban / Rural	Number	Percent
Total Population	2,704	100.00%
Urban	1,638	60.58%
Rural	1,066	39.42%
Farm	9	0.84%
Nonfarm	1,057	99.16%

Population By Race	Number	Percent
Total Population	2,704	99.30%
White	1,700	62.87%
Black	966	35.71%
American Indian / Alaskan	6	0.22%
Asian	20	0.02%
Native Hawaiian / Pacific Isl.	0	0.00%
Some Other Race	0	0.00%
Two or More Races	13	0.48%

Population By Age	Number	Percent
Total Population	27,086	100.00%
Under 18	6,873	25.38%
18 to 29 Years	4,001	14.77%
30 to 49 Years	7,629	28.17%
50 to 64 Years	4,296	15.86%
65 Years and Older	4,286	15.82%

Population in Households	Number	Percent
Total Population	2,704	100.00%
Population In households	2,704	100.00%
In Family Households	2,378	87.93%
In NonFamily Households	327	12.07%
In Group Quarters	0	0.00%
Institutionalized	0	0.00%
Noninstitutionalized	0	0.00%

Educational Attainment	Number	Percent
Total Population (25 & Over)	1,710	100.00%
No schooling completed	26	1.49%
Some School, No Diploma	493	28.81%
High School Graduate, GED	572	33.46%
Some College, No Degree	412	24.07%
Associate degree	65	3.77%
Bachelor's degree	88	5.15%
Master's degree	47	2.72%
Professional school degree	9	0.53%
Doctorate degree	0	0.00%

Place of Birth	Number	Percent
Total	2,704	100.00%
Native	2,680	99.11%
Born in Alabama	2,352	87.74%
Born in Northeast	58	2.16%
Born in Midwest	42	1.57%
Born in South	204	7.61%
Born in West	25	0.91%
Born outside US	0	0.00%
Foreign Born	24	0.89%
Naturalized citizen	24	100.00%
Not a citizen	0	0.00%

Residence in 1995	Number	Percent
Total Population (5 and Over)	2,461	100.00%
Same house in 1995	1,497	60.84%
Different house in 1995	964	39.16%
In United States in 1995	964	100.00%
Same County	669	69.38%
Different county	295	30.62%
Different county; Same state	198	20.55%
Different state	97	10.07%
Different state; Northeast	11	10.82%
Different state; Midwest	0	0.00%
Different state; South	83	85.57%
Different state; West	4	3.61%
Elsewhere	0	0.00%

Economics and Employment – 040

Median Family Income, 1999	$37,810
Median Household Income, 1999	$30,224
Median Per Capita Income, 1999	$18,793

Employment Status	Number	Percent
Population (16 and over)	2,002	100.00%
In labor force	1,131	56.51%
In Armed Forces	0	0.00%
Civilian	1,131	100.00%
Civilian; Employed	1,022	90.32%
Civilian; Unemployed	110	9.68%
Not in labor force	871	43.49%

Place of Work	Number	Percent
Workers (16 and over)	1,015	100.00%
Worked in Alabama	998	98.33%
In county of residence	675	67.59%
Outside county of residence	324	32.41%
Worked outside Alabama	17	1.67%

Transportation To Work	Number	Percent
Workers (16 and Over)	1,015	100.00%
Car; truck; or van	969	95.42%
Drove alone	871	89.88%
Carpooled	98	10.12%
Public transportation	7	0.69%
Motorcycle	0	0.00%
Bicycle	0	0.00%
Walked	14	1.33%
Other means	9	0.84%
Worked at home	18	1.72%

Travel Time to Work	Number	Percent
Total Workers (16 and over)	1,015	100.00%
Did Not Work at Home	998	98.28%
Less than 5 minutes	21	2.06%
5 to 9 minutes	138	13.83%
10 to 14 minutes	158	15.84%
15 to 19 minutes	161	16.09%
20 to 24 minutes	151	15.14%
25 to 29 minutes	34	3.36%
30 to 34 minutes	79	7.92%
35 to 39 minutes	0	0.00%
40 to 44 minutes	14	1.35%
45 to 59 minutes	80	8.02%
60 to 89 minutes	103	10.33%
90 or more minutes	61	6.07%
Worked at Home	18	1.72%

Employment By Industry	Number	Percent
Employed, 16 and Over	1,022	100.00%
Agri; Forestry; Fish/Hunt	6	0.59%
Mining	40	3.92%
Construction	81	7.88%
Manufacturing	301	29.42%
Wholesale Trade	21	2.06%
Retail Trade	160	15.66%
Transportation/Warehousing	35	3.38%
Utilities	37	3.62%
Information	5	0.49%
Finance and Insurance	62	6.02%
Real Estate	0	0.00%
Prof; Scientific; Tech Svcs	27	2.64%
Mgmt of Companies/Ent	0	0.00%
Admin; Waste Mgmt Svcs	27	2.59%
Educational Services	51	4.99%
Health Care/Social Assist.	35	3.38%
Arts; Entertainment; Rec	12	1.17%
Accommodation/Food Svcs	42	4.06%
Public Administration	46	4.45%
Other Services	38	3.67%

Housing – 040

Median Year Structure Built	1978

Housing	Number	Percent
Total Housing Units	1,195	100.00%
Urban	737	61.70%
Rural	458	38.30%

Housing Occupancy	Number	Percent
Total	1,195	100.00%
Occupied	1,098	91.92%
Owner Occupied	797	72.59%
Renter Occupied	301	27.41%
Vacant	97	8.08%
For Rent	32	33.16%
For Sale Only	25	25.39%
Rented or Sold;	0	0.00%
For Seasonal Use	9	9.33%
For Migrant Workers	0	0.00%
Other vacant	31	32.12%

Household Size	Number	Percent
Total Occupied Housing Units	1,098	100.00%
1-person household	302	27.50%
2-person household	364	33.15%
3-person household	232	21.08%
4-person household	109	9.88%
5-person household	50	4.55%
6-person household	32	2.91%
7-or-more-person household	10	0.91%

Average Household Size	# Persons
All Housing Units	2.49
Owner occupied	2.54
Renter occupied	2.42

Units & Rooms in Structure	Number	Percent
Housing units: Total	1,195	100.00%
1 Unit - Detached	629	52.62%
1 Unit - Attached	16	1.34%
2 units in structure	41	3.43%
3 or 4 units in structure	49	4.06%
5 to 9 units in structure	40	3.31%
10 to 19 units in structure	9	0.75%
20 to 49 units in structure	44	3.64%
50 or more units in structure	22	1.80%
Mobile home	347	29.05%
Boat; RV; van; etc.	0	0.00%
Median number of rooms		5.47

House Heating Fuel	Number	Percent
Total Occupied Housing Units	1,098	100.00%
Utility gas	221	20.13%
Bottled; tank; or LP gas	243	22.13%
Electricity	634	57.74%
Fuel oil; kerosene; etc.	0	0.00%
Coal or coke	0	0.00%
Wood	0	0.00%
Solar energy	0	0.00%
Other fuel	0	0.00%
No fuel used	0	0.00%

Telephone Service	Number	Percent
Total Occupied Housing Units	1,098	100.00%
Telephone Service Available	1,010	91.94%
No Telephone Service Available	89	8.06%

Vehicles Available	Number	Percent
Total Occupied Housing Units	1,098	100.00%
No vehicle available	147	13.34%
1 vehicle available	349	31.74%
2 vehicles available	322	29.33%
3 vehicles available	211	19.17%
4 vehicles available	49	4.42%
5 or more vehicles available	22	2.00%

Plumbing Facilities	Number	Percent
Total Housing Units	1,195	100.00%
Complete plumbing facilities	1,195	100.00%
Lacking complete plumbing facilities	0	0.00%

Kitchen Facilities	Number	Percent
Total Housing Units	1,195	100.00%
Complete kitchen facilities	1,190	99.62%
Lacking complete kitchen facilities	5	0.38%

Rating and Issues – 040

Criteria	Rating
Impaired Water Bodies	5
ADEM Basin Assessment Rating for NPS Potential	5
NRCS Priority Watershed	1
AWW Water Quality Monitoring and Results	5
Use Classification	3
Land Use Character	5
Potential for Silviculture	4
Sediment Loads	5
Animal Density	4
Soil Suitability for Development	5
Growth Rate of County	2
Increase in Traffic Volume	1
Number of Permitted Dischargers	2
Presence of Hydroelectric Dam	1
Housing Density	5
Septic System Density	1
Number of Endangered Species	4
2000 Unemployment Rate	5
Total	**63 High**

With a rating score of 63, the Kahatchee Creek watershed is considered to be a high priority watershed in the Lower Coosa River Basin. For more information on the watershed rating and ranking system, refer to the *Lower Coosa River Basin Management Plan*, Part IV, Chapter 12: Priority Watersheds.

A total of 23 issues were identified in the Lower Coosa River Basin. Of these, 12 are present in the Kahatchee Creek watershed, of which five are basinwide issues and seven are regional issues. The focus of the regional watershed management measures for this watershed is managing urban growth and development and protection of aquatic habitats.

Refer to the Lower Coosa River Basin Management Plan, Part IV, Chapter 14: Water Quality Improvement Strategy for management measures that may be implemented in this watershed.

Basinwide Issues:

- Endangered Species
- Lack of Water Quality Trend Data
- Illegal Dumping
- Lack of Education and Awareness
- FERC Relicensing of Hydroelectric Facilities

Regional Issues:

- Agricultural Runoff
- Silviculture Runoff
- Urban Runoff
- Sedimentation
- Low Dissolved Oxygen
- Priority Organics
- Mining Runoff

Beeswax Creek Watershed
HUC: 03150107-050

Watershed Area:	36,371 ac.
Percent of Basin:	2.92%
Type:	Urban
County-Headwaters:	Shelby
County-Mouth:	Shelby
Municipalities:	Wilsonville Columbiana
Total Population:	5,043
Percent of Basin:	4.60%

Land Use

Lakes and Ponds	800 ac
Cropland	1,000 ac
Pastureland	6,100 ac
Forestland	25,091 ac
Urbanized	3,055 ac
Mined Land	70 ac
Other Land	255 ac

Animal Data

Cattle	2,000
Dairy	0
Swine	0
Broilers	0
Layers	0
Catfish Acres	0

Domestic Water Data

Septic Tanks	3,000
Failing Septic Tanks	90
Alternative Systems	50

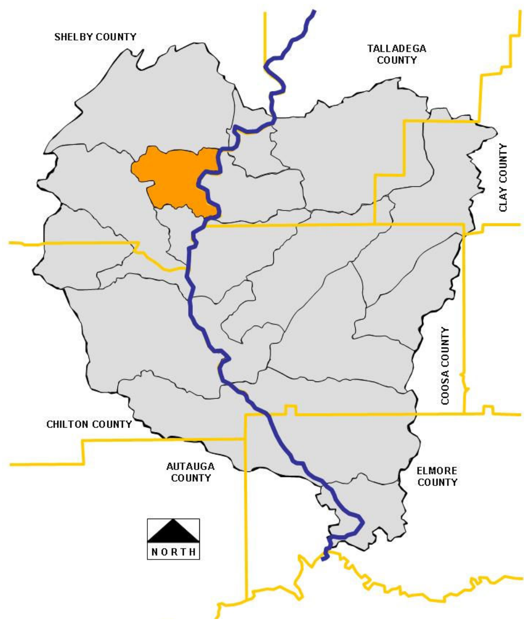
Sediment Loads (in tons)

Total	736,927
Cropland	2,100
Sand & Gravel Pits	17,500
Mined Land	6,000
Developing Urban Land	611,000
Gullies	0
Critical Areas	85,000
Streambanks	300
Dirt Roads and Banks	7,500
Woodland	7,527

Water Users

Public Water Supply	0
Total Permitted Dischargers	1
Municipal	1
Industrial	0
Mining	0

Beeswax Creek Watershed Location Map



Impaired Water Bodies............. Lay Lake and Unnamed Tributary to Dry Branch

Active Water Quality Monitoring Sites........................ 1

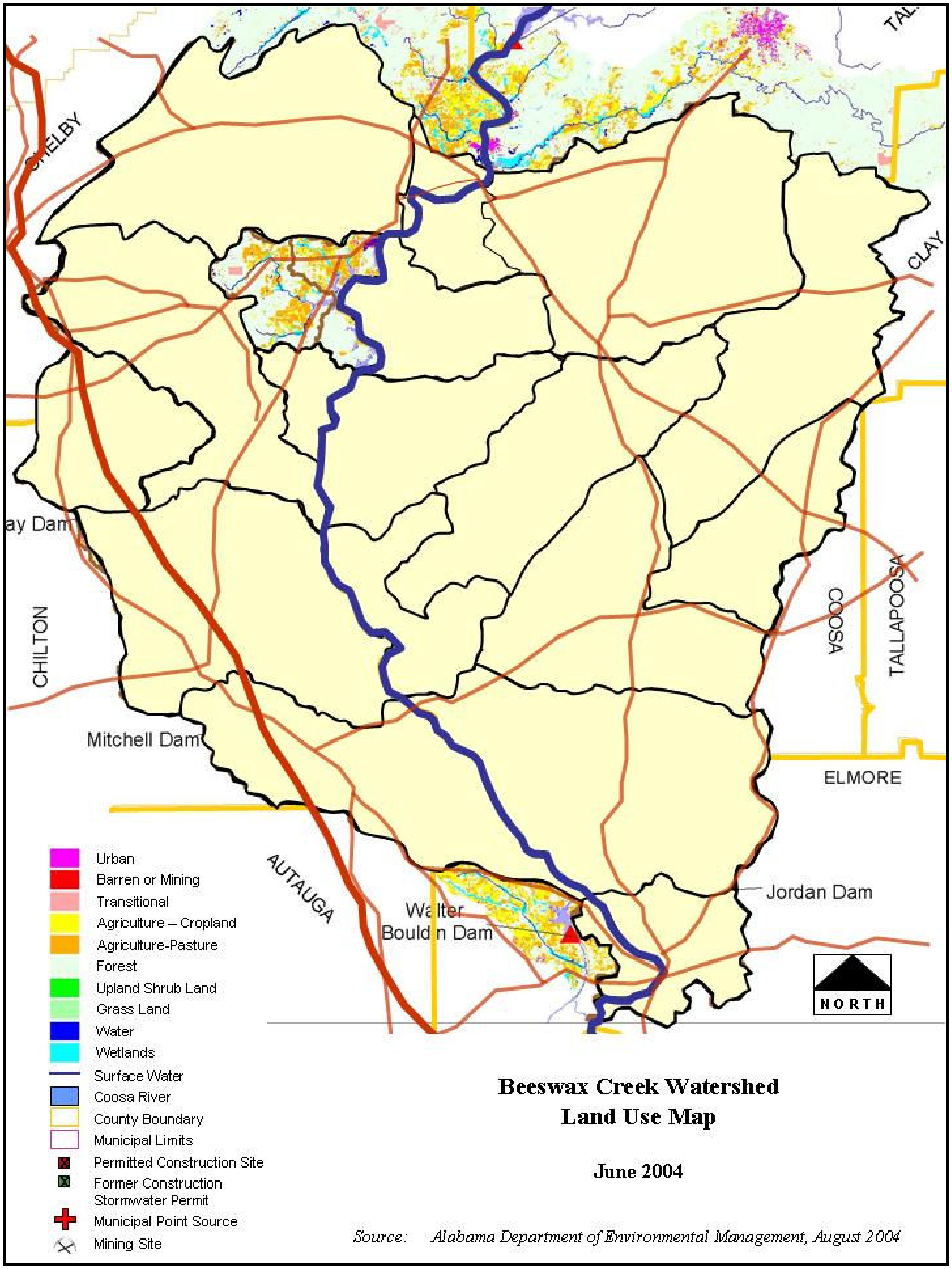
Suitability for Development............................ Moderate

2005 Priority Watershed Rating............................. High

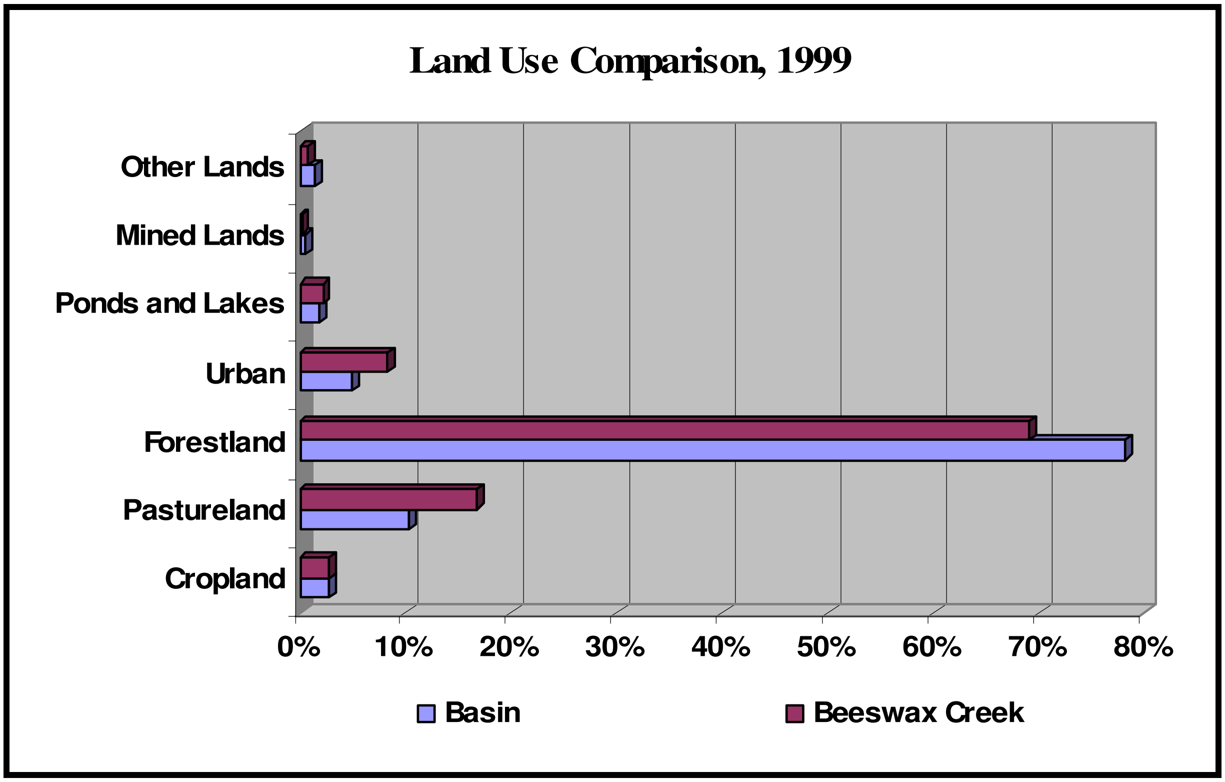
Major Contributing Factors

- Impaired Waterbodies
- ADEM Assessment Rating for Nonpoint Source Pollution
- Alabama Water Watch Water Quality Monitoring and Results
- Urban Land Uses
- Sediment Loads
- Growth Rate of County
- Housing Density
- Septic System Density

Land Use – 050



SHELBY
TAL
CLAY
ay Dam
CHILTON
COOSA
TALLAPOOSA
Mitchell Dam
ELMORE
AUTAUGA
Walter Bouldin Dam
Jordan Dam
NORTH
Urban
Barren or Mining
Transitional
Agriculture – Cropland
Agriculture-Pasture
Forest
Upland Shrub Land
Grass Land
Water
Wetlands
Surface Water
Coosa River
County Boundary
Municipal Limits
Permitted Construction Site
Former Construction Stormwater Permit
Municipal Point Source
Mining Site
Beeswax Creek Watershed
Land Use Map
June 2004
Source: Alabama Department of Environmental Management, August 2004



Land Use Patterns

The Beeswax Creek watershed has an urban character due to the presence of Wilsonville and part of Columbiana in relation to the small size of the watershed. Urban land uses comprise 8 percent of the watershed, compared to 5 percent of the basin, and are located in the northeast corner and the western fourth of the watershed. The watershed produces the second highest amount of sediment of the 20 watersheds in the basin, at 20.26 tons per acre. Sediment from developing urban lands, at 16.80 tons per acre, is the largest part of the sediment produced in the watershed. It is estimated that there are 3,000 septic systems in the watershed, with a 3 percent failure rate. This is fairly high septic system density at 12.12 acres per system. Agricultural land uses comprise 20 percent of the watershed and forest land comprises 69 percent. Concentrations of agricultural land are found in the north and central part of the watershed, while forest land is located in the southeast corner and in the west central part of the watershed between Beeswax Creek and Little Beeswax Creek. Of the agricultural land, 17 percent is in pasture use and 3 percent is used for crop production. It is estimated that there are approximately 2,000 head of cattle in the watershed. Of the total forest land, only 30.83 percent is deciduous forest, compared to 40.58 percent for the basin. The remaining 69.17 percent of forest land is evergreen and mixed forest, indicating a high probability of active silviculture practices in the watershed.

Primary access is provided to the Beeswax Creek watershed via Alabama Highways 25 and 145. Highway 25 has shown a significant increase in traffic volume between 1994 and 2002 with a 16.61 percent increase southwest of Wilsonville and an 18.12 percent increase northeast of Columbiana. Within the watershed, the traffic volume on Highway 145 has only increased 2.70 percent in the same time period.

Soils and Species – 050

The Beeswax Creek watershed is comprised soils in two soil associations: the Decatur-Dewey-Allen Association and the Montevallo-Townley-Enders Association. Most of the eastern portion of the watershed is comprised of soils in the Decatur-Dewey-Allen Association. The southeast corner of the watershed, however, is comprised of soils in the Montevallo-Townley-Enders Association, as is the western half of the watershed. The soil suitability and limitations for selected uses are provided in the table below. For a map of the soil associations in the watershed and in the Lower Coosa River Basin, refer to the Soil Association Map on page 9.

Soil Association Number	6	16
Soil Association	**Decatur-Dewey-Allen**	**Montevallo-Townley-Enders**
Dominant Slope, %	1 - 10	6 - 40
Soil Suitability and Major Limitations For:		
Cropland	Good	Poor: slope, depth to rock
Pastureland	Good	Poor: slope, droughty
Woodland	Good	Poor: depth to rock
Soil Limitations For:		
Septic Systems	Slight	Severe: depth to rock, slope
Local Roads and Streets	Moderate: low strength	Severe: slope
Small Commercial Buildings	Moderate	Severe: slope
Dwellings without Basements	Moderate	Severe: slope
Camp Areas	Slight	Severe: slope
Picnic Areas	Slight	Severe: slope
Playgrounds	Slight	Severe: slope, depth to rock
Paths and Trails	Slight	Severe: slope

The Beeswax Creek watershed is primarily located in Ridge and Valley Level III Ecoregions. A small portion of the watershed along the southwest boundary is located in the Piedmont Level III Ecoregion. The watershed is further subdivided into three Level IV Sub-Ecoregions: the Southern Shale Valleys, the Southern Limestone / Dolomite Valleys and Low Rolling Hills, and the Southern Sandstone Ridges. In addition to the protected species found throughout the Lower Coosa River Basin (listed on page 14), the following protected species are found in the Beeswax Creek watershed.

Common Name	Scientific Name	Distribution in Lower Coosa River
Coldwater Darter	*Etheostoma ditrema*	(1) Spring-dwelling race-Shelby to Coosa Counties (2) Stream race-Waxahatchee Creek tribs, Shelby County; Coosa River tribs, Coosa County
Dusky Gopher Frog	*Rana capito sevosa*	Shelby County
Appalachian Bewick's wren	*Thryomanes bewickii altus*	North of the Fall Line, particularly in Ridge and Valley province
Bachman's Sparrow	*Aimophila aestivalis*	Coastal Plain and Piedmont province
Mud Elimia	*Elimia alabamensis*	Shelby, Talladega, Chilton, Coosa Counties
Upland Hornsnail	*Pleurocera showalteri*	Shelby and Talladega Counties
Knotty Pebblesnail	*Smoatogyrus constrictus*	Wetumpka, Elmore Count; Wilsonville, Shelby County. May be extinct.
Granite Pebblesnail	*Somatogyrus hinkleyi*	Wetumpka, Elmore County; Wilsonville, Shelby County
Shoals Spiderlily	*Hymenoccallis coronaria*	Shelby County
Running Post Oak	*Quercus boyntonii*	Ridge and Valley Province of Shelby County

Demographics – 050

Population - Urban / Rural	Number	Percent
Total Population	5,043	100.00%
Urban	0	0.00%
Rural	5,043	100.00%
Farm	45	0.88%
Nonfarm	4,999	99.12%

Population By Race	Number	Percent
Total Population	5,043	99.49%
White	4,721	93.62%
Black	238	4.72%
American Indian / Alaskan	7	0.14%
Asian	27	0.02%
Native Hawaiian / Pacific Isl.	0	0.00%
Some Other Race	44	0.87%
Two or More Races	6	0.12%

Population By Age	Number	Percent
Total Population	5,043	100.00%
Under 18	1,202	23.82%
18 to 29 Years	698	13.84%
30 to 49 Years	1,504	29.83%
50 to 64 Years	921	18.27%
65 Years and Older	718	14.24%

Population in Households	Number	Percent
Total Population	5,043	100.00%
Population In households	4,998	99.10%
In Family Households	4,506	90.15%
In NonFamily Households	492	9.85%
In Group Quarters	45	0.90%
Institutionalized	45	100.00%
Noninstitutionalized	0	0.00%

Educational Attainment	Number	Percent
Total Population (25 & Over)	3,455	100.00%
No schooling completed	29	0.83%
Some School, No Diploma	687	19.88%
High School Graduate, GED	1,330	38.49%
Some College, No Degree	780	22.59%
Associate degree	130	3.76%
Bachelor's degree	315	9.13%
Master's degree	131	3.78%
Professional school degree	48	1.38%
Doctorate degree	6	0.18%

Place of Birth	Number	Percent
Total	5,043	100.00%
Native	4,950	98.15%
Born in Alabama	3,934	79.48%
Born in Northeast	91	1.83%
Born in Midwest	244	4.93%
Born in South	589	11.90%
Born in West	73	1.48%
Born outside US	19	0.38%
Foreign Born	94	1.85%
Naturalized citizen	32	34.22%
Not a citizen	62	65.78%

Residence in 1995	Number	Percent
Total Population (5 and Over)	4,758	100.00%
Same house in 1995	2,805	58.95%
Different house in 1995	1,953	41.05%
In United States in 1995	1,879	96.21%
Same County	1,152	61.32%
Different county	727	38.68%
Different county; Same state	478	25.45%
Different state	249	13.23%
Different state; Northeast	0	0.00%
Different state; Midwest	61	24.45%
Different state; South	140	56.44%
Different state; West	48	19.11%
Elsewhere	74	3.79%

Economics and Employment – 050

Median Family Income, 1999	$49,417
Median Household Income, 1999	$42,586
Median Per Capita Income, 1999	$20,059

Employment Status	Number	Percent
Population (16 and over)	3,997	100.00%
In labor force	2,348	58.73%
In Armed Forces	0	0.00%
Civilian	2,348	100.00%
Civilian; Employed	2,233	95.11%
Civilian; Unemployed	115	4.89%
Not in labor force	1,650	41.27%

Place of Work	Number	Percent
Workers (16 and over)	2,185	100.00%
Worked in Alabama	2,168	99.22%
In county of residence	1,436	66.22%
Outside county of residence	732	33.78%
Worked outside Alabama	17	0.78%

Transportation To Work	Number	Percent
Workers (16 and Over)	2,185	100.00%
Car; truck; or van	2,093	95.80%
Drove alone	1,789	85.44%
Carpooled	305	14.56%
Public transportation	10	0.46%
Motorcycle	0	0.00%
Bicycle	0	0.00%
Walked	28	1.28%
Other means	12	0.53%
Worked at home	42	1.93%

Travel Time to Work	Number	Percent
Total Workers (16 and over)	2,185	100.00%
Did Not Work at Home	2,143	98.07%
Less than 5 minutes	79	3.70%
5 to 9 minutes	215	10.01%
10 to 14 minutes	205	9.56%
15 to 19 minutes	208	9.72%
20 to 24 minutes	132	6.15%
25 to 29 minutes	75	3.48%
30 to 34 minutes	316	14.74%
35 to 39 minutes	121	5.65%
40 to 44 minutes	101	4.71%
45 to 59 minutes	322	15.00%
60 to 89 minutes	295	13.77%
90 or more minutes	76	3.52%
Worked at Home	42	1.93%

Employment By Industry	Number	Percent
Employed, 16 and Over	2,233	100.00%
Agri; Forestry; Fish/Hunt	22	0.96%
Mining	18	0.78%
Construction	316	14.15%
Manufacturing	379	16.96%
Wholesale Trade	96	4.31%
Retail Trade	238	10.64%
Transportation/Warehousing	77	3.46%
Utilities	104	4.64%
Information	57	2.56%
Finance and Insurance	162	7.23%
Real Estate	52	2.34%
Prof; Scientific; Tech Svcs	83	3.69%
Mgmt of Companies/Ent	0	0.00%
Admin; Waste Mgmt Svcs	51	2.28%
Educational Services	178	7.96%
Health Care/Social Assist.	120	5.35%
Arts; Entertainment; Rec	3	0.13%
Accommodation/Food Svcs	67	2.98%
Public Administration	82	3.66%
Other Services	132	5.89%

Housing – 050

Median Year Structure Built	1980

Housing	Number	Percent
Total Housing Units	2,377	100.00%
Urban	0	0.00%
Rural	2,377	100.00%

Housing Occupancy	Number	Percent
Total	2,377	100.00%
Occupied	1,955	82.25%
Owner Occupied	1,677	85.76%
Renter Occupied	279	14.24%
Vacant	422	17.75%
For Rent	46	10.90%
For Sale Only	60	14.22%
Rented or Sold;	6	1.42%
For Seasonal Use	256	60.66%
For Migrant Workers	0	0.00%
Other vacant	54	12.80%

Household Size	Number	Percent
Total Occupied Housing Units	1,955	100.00%
1-person household	391	20.00%
2-person household	767	39.21%
3-person household	365	18.64%
4-person household	289	14.79%
5-person household	110	5.60%
6-person household	23	1.19%
7-or-more-person household	11	0.56%

Average Household Size	# Persons
All Housing Units	2.53
Owner occupied	2.55
Renter occupied	2.45

Units & Rooms in Structure	Number	Percent
Housing units: Total	2,377	100.00%
1 Unit - Detached	1,460	61.40%
1 Unit - Attached	3	0.14%
2 units in structure	26	1.07%
3 or 4 units in structure	38	1.61%
5 to 9 units in structure	16	0.67%
10 to 19 units in structure	8	0.34%
20 to 49 units in structure	0	0.00%
50 or more units in structure	0	0.00%
Mobile home	819	34.43%
Boat; RV; van; etc.	8	0.34%
Median number of rooms		5.64

House Heating Fuel	Number	Percent
Total Occupied Housing Units	1,955	100.00%
Utility gas	287	14.69%
Bottled; tank; or LP gas	434	22.20%
Electricity	1,184	60.54%
Fuel oil; kerosene; etc.	11	0.56%
Coal or coke	2	0.10%
Wood	22	1.11%
Solar energy	0	0.00%
Other fuel	16	0.79%
No fuel used	0	0.00%

Telephone Service	Number	Percent
Total Occupied Housing Units	1,955	100.00%
Telephone Service Available	1,902	97.29%
No Telephone Service Available	53	2.71%

Vehicles Available	Number	Percent
Total Occupied Housing Units	1,955	100.00%
No vehicle available	100	5.13%
1 vehicle available	445	22.73%
2 vehicles available	854	43.69%
3 vehicles available	390	19.96%
4 vehicles available	110	5.61%
5 or more vehicles available	56	2.88%

Plumbing Facilities	Number	Percent
Total Housing Units	2,377	100.00%
Complete plumbing facilities	2,370	99.71%
Lacking complete plumbing facilities	7	0.29%

Kitchen Facilities	Number	Percent
Total Housing Units	2,377	100.00%
Complete kitchen facilities	2,359	99.24%
Lacking complete kitchen facilities	18	0.76%

Rating and Issues – 050

Criteria	Rating
Impaired Water Bodies	5
ADEM Basin Assessment Rating for NPS Potential	5
NRCS Priority Watershed	3
AWW Water Quality Monitoring and Results	5
Use Classification	1
Land Use Character	5
Potential for Silviculture	
Sediment Loads	5
Animal Density	4
Soil Suitability for Development	3
Growth Rate of County	5
Increase in Traffic Volume	3
Number of Permitted Dischargers	2
Presence of Hydroelectric Dam	1
Housing Density	5
Septic System Density	5
Number of Endangered Species	4
2000 Unemployment Rate	3
Total	**68 High**

With a rating score of 68, the Beeswax Creek watershed is considered to be a high priority watershed in the Lower Coosa River Basin. For more information on the watershed rating and ranking system, refer to the *Lower Coosa River Basin Management Plan*, Part IV, Chapter 12: Priority Watersheds.

A total of 23 issues were identified in the Lower Coosa River Basin. Of these, 15 are present in the Beeswax Creek watershed, of which five are basinwide issues, eight are regional issues, and two are local concerns. The focus of the regional watershed management measures for this watershed is managing urban growth, mitigation of stormwater runoff and water quality improvement.

Refer to the Lower Coosa River Basin Management Plan, Part IV, Chapter 14: Water Quality Improvement Strategy for management measures that may be implemented in this watershed.

Basinwide Issues:
- Endangered Species
- Lack of Water Quality Trend Data
- Illegal Dumping
- Lack of Education and Awareness
- FERC Relicensing of Hydroelectric Facilities

Regional Issues:
- Growth Rate and Urban Development
- Agricultural Runoff
- Urban Runoff
- Sedimentation
- Nutrients, Algae and Invasive Species
- Low Dissolved Oxygen
- Upstream Contamination
- Priority Organics

Local Concerns:
- Point Source Discharges
- Low Flow

Cedar Creek Watershed
HUC: 03150107-060

Watershed Area:	41,594 ac.
Percent of Basin:	3.33%
Type:	Agricultural
County-Headwaters:	Talladega
County-Mouth:	Talladega
Municipalities:	None
Total Population:	3,234
Percent of Basin:	2.95%

Land Use

Lakes and Ponds	2,912 ac
Cropland	1,664 ac
Pastureland	10,399 ac
Forestland	24955 ac
Urbanized	1,248 ac
Mined Land	0 ac
Other Land	416 ac

Animal Data

Cattle	1,080
Dairy	0
Swine	80
Broilers	0
Layers	0
Catfish Acres	300

Domestic Water Data

Septic Tanks	0
Failing Septic Tanks	0
Alternative Systems	0

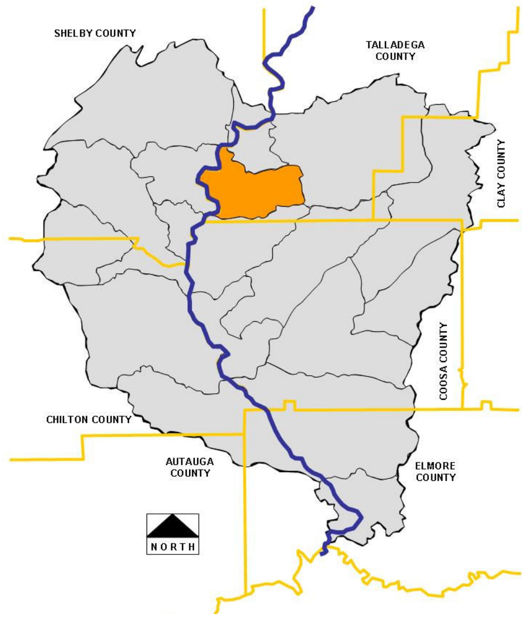
Sediment Loads (in tons)

Total	200,820
Cropland	10,481
Sand & Gravel Pits	28,000
Mined Land	60,000
Developing Urban Land	40,000
Gullies	0
Critical Areas	9,000
Streambanks	43,500
Dirt Roads and Banks	3,600
Woodland	6,39

Water Users

Public Water Supply	0
Total Permitted Dischargers	5
Municipal	0
Industrial	4
Mining	1

Cedar Creek Watershed Location Map



Impaired Water Bodies.................................. Lay Lake

Active Water Quality Monitoring Sites........................ 2

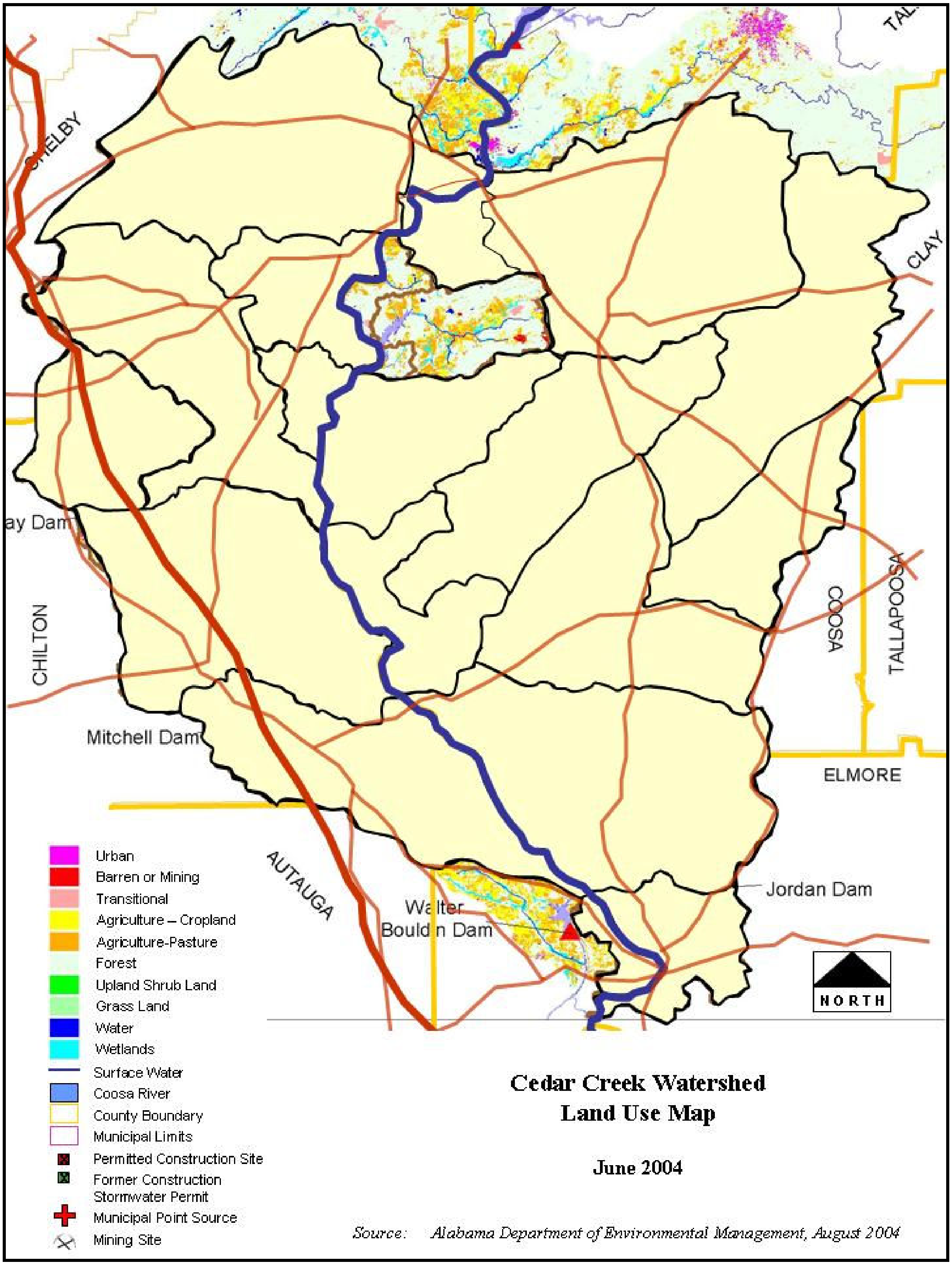
Suitability for Development................................. Good

2005 Priority Watershed Rating..............................Low

Major Contributing Factors

- Impaired Waterbodies
- ADEM Assessment Rating for Nonpoint Source Pollution
- Housing Density
- Potential for Silviculture
- Number of Endangered Species

Land Use – 060



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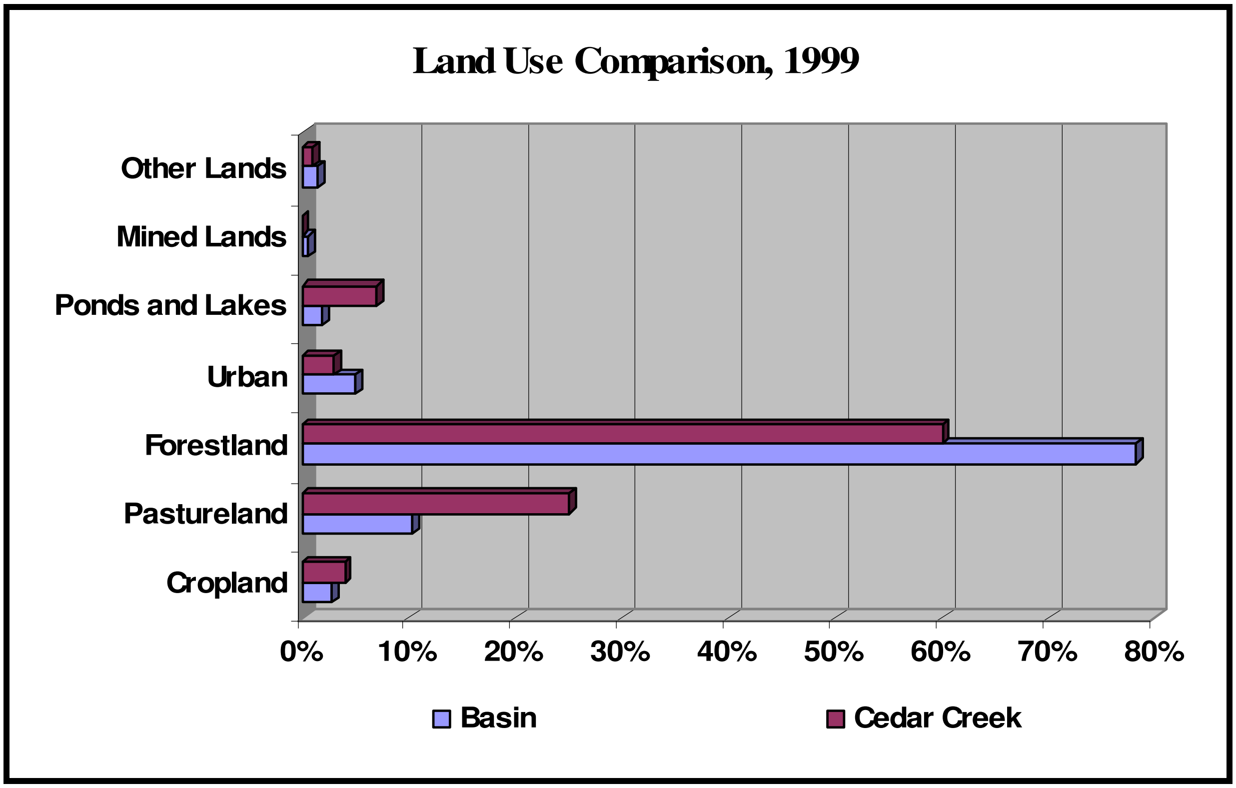
COOSA
TALLAPOOSA
Mitchell Dam
ELMORE
AUTAUGA
Jordan Dam
Walter
Bouldin Dam
NORTH
Urban
Barren or Mining
Transitional
Agriculture – Cropland
Agriculture-Pasture
Forest
Upland Shrub Land
Grass Land
Water
Wetlands
Surface Water
Coosa River
County Boundary
Municipal Limits
Permitted Construction Site
Former Construction Stormwater Permit
Municipal Point Source
Mining Site
Cedar Creek Watershed
Land Use Map
June 2004
Source: Alabama Department of Environmental Management, August 2004



Land Use Patterns

The Cedar Creek watershed is agricultural in character, with 29 percent of the land in agricultural use, as compared with 13 percent of the land in the Lower Coosa River Basin. Only 4 percent of the agricultural land is used for crop production, while the remaining 25 percent is pasture land. It is estimated that there are 1,080 head of cattle and 80 swine in the watershed, along with 300 acres that are used for catfish farming. Agricultural uses are located in the south central part of the basin, with forested land located around the west, east, and northern perimeter of the watershed. It is estimated that the Cedar Creek watershed produces 4.71 tons of sediment per acre, which is comparable to the basin overall, at 4.25 tons per acre. The watershed does, however, have the second highest output of cropland sediment in the basin. Other major sediment contributors are mined lands and streambanks. One mining operation, Alabama Marble Company, Inc. is located in the central part of the watershed, just south of Cedar Creek. The ratio of urban and forest land uses in the watershed are considerably less than in the basin overall. Only 3 percent of the watershed is used for urban purposes, most of which are located along the eastern boundary on the west side of Sylacauga. There are some industrial uses found in the central part of the watershed. Forest land uses comprise 60 percent of the basin, as compared with 78 percent for the basin overall. Approximately one-third of the forested land use is deciduous forest, while the remaining 66 percent is evergreen and mixed forest, lending itself to a considerable amount of active timber production in the watershed.

There are no major roads located in the watershed. U.S. Highway 280/231 does run north-south just east of the watershed boundary. The Coosa River forms the western boundary and there are no bridges across the river to provide access to the watershed.

Soils and Species – 060

The Cedar Creek watershed is comprised of soils in three soil associations: the Decatur-Dewey-Allen Association, the Montevallo-Townley-Enders Association and the Tallapoosa-Tatum Association. The predominant soils group is the Decatur-Dewey-Allen Association. A small amount of the Montevallo-Townley-Enders Association is found along the western boundary and a small amount of the Tallapoosa-Tatum Association is found the along the northeastern and southeastern boundaries. The soil suitability and limitations for selected uses are provided in the table below. For a map of the soil associations in the watershed and in the Lower Coosa River Basin, refer to the Soil Association Map on page 9.

Soil Association Number	**6**	**16**	**25**
Soil Association	**Decatur-Dewey-Allen**	**Montevallo-Townley-Enders**	**Tallapoosa-Tatum**
Dominant Slope, %	1 - 10	6 - 40	6 - 50
Soil Suitability and Major Limitations For:			
Cropland	Good	Poor: slope, depth to rock	Poor: slope, droughty
Pastureland	Good	Poor: slope, droughty	Poor: slope
Woodland	Good	Poor: depth to rock	Good
Soil Limitations For:			
Septic Systems	Slight	Severe: depth to rock, slope	Severe: slope, depth to bedrock
Local Roads and Streets	Moderate: low strength	Severe: slope	Severe: slope
Small Commercial Buildings	Moderate	Severe: slope	Severe: slope
Dwellings without Basements	Moderate	Severe: slope	Severe: slope
Camp Areas	Slight	Severe: slope	Severe: slope
Picnic Areas	Slight	Severe: slope	Severe: slope
Playgrounds	Slight	Severe: slope, depth to rock	Severe: slope
Paths and Trails	Slight	Severe: slope	Severe: slope

The Cedar Creek watershed is located in two Level III Ecoregions. The largest portion of the watershed is in the Ridge and Valley and a small portion along the southeastern boundary is the Piedmont. The watershed is further subdivided into three Level IV Ecoregions of the Ridge and Valley: the Southern Shale Valleys, the Southern Limestone / Dolomite Valleys and Low Rolling Hills and the Southern Dissected Ridges and Knobs. In addition to the protected species found throughout the Lower Coosa River Basin (listed on page 14), the following protected species are found in the Cedar Creek watershed.

Common Name	Scientific Name	Distribution in Lower Coosa River Basin
Appalachian Bewick's wren	*Thryomanes bewickii altus*	North of the Fall Line, particularly in Ridge and Valley province
Bald Eagle	*Haliaeetus leucocephalus*	Coastal Plain and Piedmont province
Bachman's Sparrow	*Aimophila aestivalis*	Coastal Plain and Piedmont province
Mud Elimia	*Elimia alabamensis*	Shelby, Talladega, Chilton, Coosa Counties
Upland Hornsnail	*Pleurocera showalteri*	Shelby and Talladega Counties
Nevius Stonecrop	*Sedum nevii*	Chilton, Coosa, Talladega Counties

Demographics – 060

Population - Urban / Rural	Number	Percent
Total Population	3,234	100.00%
Urban	497	15.38%
Rural	2,737	84.62%
Farm	12	0.43%
Nonfarm	2,725	99.57%

Population By Race	Number	Percent
Total Population	3,234	99.90%
White	2,830	87.52%
Black	366	11.32%
American Indian / Alaskan	10	0.29%
Asian	3	0.00%
Native Hawaiian / Pacific Isl.	0	0.00%
Some Other Race	5	0.15%
Two or More Races	20	0.62%

Population By Age	Number	Percent
Total Population	3,234	100.00%
Under 18	777	24.04%
18 to 29 Years	425	13.13%
30 to 49 Years	963	29.78%
50 to 64 Years	616	19.04%
65 Years and Older	453	14.01%

Population in Households	Number	Percent
Total Population	3,234	100.00%
Population In households	3,224	99.70%
In Family Households	2,875	89.16%
In NonFamily Households	349	10.84%
In Group Quarters	10	0.30%
Institutionalized	10	100.00%
Noninstitutionalized	0	0.00%

Educational Attainment	Number	Percent
Total Population (25 & Over)	2,201	100.00%
No schooling completed	27	1.22%
Some School, No Diploma	455	20.68%
High School Graduate, GED	905	41.12%
Some College, No Degree	481	21.84%
Associate degree	149	6.76%
Bachelor's degree	128	5.84%
Master's degree	36	1.64%
Professional school degree	18	0.81%
Doctorate degree	2	0.09%

Place of Birth	Number	Percent
Total	3,234	100.00%
Native	3,220	99.57%
Born in Alabama	2,752	85.46%
Born in Northeast	43	1.32%
Born in Midwest	79	2.47%
Born in South	303	9.40%
Born in West	41	1.28%
Born outside US	3	0.08%
Foreign Born	14	0.43%
Naturalized citizen	3	20.00%
Not a citizen	11	80.00%

Residence in 1995	Number	Percent
Total Population (5 and Over)	3,050	100.00%
Same house in 1995	1,930	63.28%
Different house in 1995	1,120	36.72%
In United States in 1995	1,111	99.20%
Same County	692	62.24%
Different county	420	37.76%
Different county; Same state	305	27.42%
Different state	115	10.34%
Different state; Northeast	2	1.74%
Different state; Midwest	3	2.61%
Different state; South	106	91.91%
Different state; West	4	3.74%
Elsewhere	9	0.80%

Economics and Employment – 060

Median Family Income, 1999	$41,867
Median Household Income, 1999	$32,260
Median Per Capita Income, 1999	$17,585

Employment Status	Number	Percent
Population (16 and over)	2,548	100.00%
In labor force	1,491	58.52%
In Armed Forces	2	0.10%
Civilian	1,490	99.90%
Civilian; Employed	1,410	94.68%
Civilian; Unemployed	79	5.32%
Not in labor force	1,057	41.48%

Place of Work	Number	Percent
Workers (16 and over)	1,386	100.00%
Worked in Alabama	1,373	99.01%
In county of residence	1,004	73.13%
Outside county of residence	369	26.87%
Worked outside Alabama	14	0.99%

Transportation To Work	Number	Percent
Workers (16 and Over)	1,386	100.00%
Car; truck; or van	1,335	96.30%
Drove alone	1,194	89.45%
Carpooled	141	10.55%
Public transportation	3	0.22%
Motorcycle	0	0.00%
Bicycle	0	0.00%
Walked	6	0.42%
Other means	17	1.23%
Worked at home	25	1.84%

Travel Time to Work	Number	Percent
Total Workers (16 and over)	1,386	100.00%
Did Not Work at Home	1,361	98.16%
Less than 5 minutes	35	2.59%
5 to 9 minutes	115	8.44%
10 to 14 minutes	174	12.82%
15 to 19 minutes	262	19.22%
20 to 24 minutes	146	10.74%
25 to 29 minutes	59	4.36%
30 to 34 minutes	170	12.48%
35 to 39 minutes	14	1.01%
40 to 44 minutes	37	2.73%
45 to 59 minutes	96	7.02%
60 to 89 minutes	196	14.42%
90 or more minutes	57	4.17%
Worked at Home	25	1.84%

Employment By Industry	Number	Percent
Employed, 16 and Over	1,410	100.00%
Agri; Forestry; Fish/Hunt	16	1.12%
Mining	51	3.60%
Construction	125	8.83%
Manufacturing	305	21.61%
Wholesale Trade	66	4.68%
Retail Trade	197	13.97%
Transportation/Warehousing	63	4.44%
Utilities	19	1.34%
Information	25	1.78%
Finance and Insurance	43	3.06%
Real Estate	11	0.78%
Prof; Scientific; Tech Svcs	38	2.71%
Mgmt of Companies/Ent	0	0.00%
Admin; Waste Mgmt Svcs	23	1.65%
Educational Services	78	5.51%
Health Care/Social Assist.	163	11.59%
Arts; Entertainment; Rec	6	0.41%
Accommodation/Food Svcs	56	3.94%
Public Administration	57	4.03%
Other Services	70	4.96%

Housing – 060

Median Year Structure Built	1980

Housing	Number	Percent
Total Housing Units	1,431	100.00%
Urban	228	15.96%
Rural	1,203	84.04%

Housing Occupancy	Number	Percent
Total	1,431	100.00%
Occupied	1,264	88.35%
Owner Occupied	1,120	88.60%
Renter Occupied	144	11.40%
Vacant	167	11.65%
For Rent	25	14.93%
For Sale Only	13	7.53%
Rented or Sold;	2	1.20%
For Seasonal Use	76	45.52%
For Migrant Workers	0	0.00%
Other vacant	51	30.82%

Household Size	Number	Percent
Total Occupied Housing Units	1,264	100.00%
1-person household	269	21.27%
2-person household	475	37.54%
3-person household	236	18.67%
4-person household	192	15.15%
5-person household	63	5.00%
6-person household	19	1.53%
7-or-more-person household	11	0.84%

Average Household Size	# Persons
All Housing Units	2.58
Owner occupied	2.58
Renter occupied	2.70

Units & Rooms in Structure	Number	Percent
Housing units: Total	1,431	100.00%
1 Unit - Detached	911	63.64%
1 Unit - Attached	1	0.05%
2 units in structure	2	0.14%
3 or 4 units in structure	5	0.32%
5 to 9 units in structure	0	0.00%
10 to 19 units in structure	0	0.00%
20 to 49 units in structure	0	0.00%
50 or more units in structure	0	0.00%
Mobile home	513	35.82%
Boat; RV; van; etc.	1	0.03%
Median number of rooms		5.63

House Heating Fuel	Number	Percent
Total Occupied Housing Units	1,264	100.00%
Utility gas	162	12.82%
Bottled; tank; or LP gas	373	29.48%
Electricity	702	55.51%
Fuel oil; kerosene; etc.	0	0.00%
Coal or coke	0	0.00%
Wood	28	2.19%
Solar energy	0	0.00%
Other fuel	0	0.00%
No fuel used	0	0.00%

Telephone Service	Number	Percent
Total Occupied Housing Units	1,264	100.00%
Telephone Service Available	1,226	96.97%
No Telephone Service Available	38	3.03%

Vehicles Available	Number	Percent
Total Occupied Housing Units	1,264	100.00%
No vehicle available	66	5.22%
1 vehicle available	329	26.00%
2 vehicles available	508	40.16%
3 vehicles available	255	20.16%
4 vehicles available	59	4.70%
5 or more vehicles available	48	3.76%

Plumbing Facilities	Number	Percent
Total Housing Units	1,431	100.00%
Complete plumbing facilities	1,406	98.23%
Lacking complete plumbing facilities	25	1.77%

Kitchen Facilities	Number	Percent
Total Housing Units	1,431	100.00%
Complete kitchen facilities	1,417	99.05%
Lacking complete kitchen facilities	14	0.95%

Rating and Issues – 060

Criteria	Rating
Impaired Water Bodies	5
ADEM Basin Assessment Rating for NPS Potential	5
NRCS Priority Watershed	1
AWW Water Quality Monitoring and Results	3
Use Classification	1
Land Use Character	3
Potential for Silviculture	4
Sediment Loads	3
Animal Density	3
Soil Suitability for Development	2
Growth Rate of County	2
Increase in Traffic Volume	1
Number of Permitted Dischargers	2
Presence of Hydroelectric Dam	1
Housing Density	5
Septic System Density	1
Number of Endangered Species	4
2000 Unemployment Rate	3
Total	**49 Low**

With a rating score of 49, the Cedar Creek watershed is considered to be a low priority watershed in the Lower Coosa River Basin. For more information on the watershed rating and ranking system, refer to the *Lower Coosa River Basin Management Plan*, Part IV, Chapter 12: Priority Watersheds.

A total of 23 issues were identified in the Lower Coosa River Basin. Of these, 13 are present in the Cedar Creek watershed, of which five are basinwide issues and eight are regional issues. The focus of the regional watershed management measures for this watershed is mitigation of stormwater runoff and water quality improvement.

Refer to the Lower Coosa River Basin Management Plan, Part IV, Chapter 14: Water Quality Improvement Strategy for management measures that may be implemented in this watershed.

Basinwide Issues:

- Endangered Species
- Lack of Water Quality Trend Data
- Illegal Dumping
- Lack of Education and Awareness
- FERC Relicensing of Hydroelectric Facilities

Regional Issues:

- Agricultural Runoff
- Silviculture Runoff
- Sedimentation
- Nutrients, Algae and Invasive Species
- Low Dissolved Oxygen
- Upstream Contamination
- Priority Organics
- Mining Runoff

Peckerwood Creek Watershed

HUC: 03150107-070

Watershed Area:	53,130 ac.
Percent of Basin:	4.27%
Type:	Forest
County-Headwaters:	Talladega
County-Mouth:	Coosa
Municipalities:	None
Total Population:	881
Percent of Basin:	0.80%

Land Use

Lakes and Ponds	3,101 ac
Cropland	162 ac
Pastureland	2,450 ac
Forestland	46,848 ac
Urbanized	73 ac
Mined Land	108 ac
Other Land	388 ac

Animal Data

Cattle	660
Dairy	0
Swine	8
Broilers	0
Layers	0
Catfish Acres	170

Domestic Water Data

Septic Tanks	150
Failing Septic Tanks	5
Alternative Systems	0

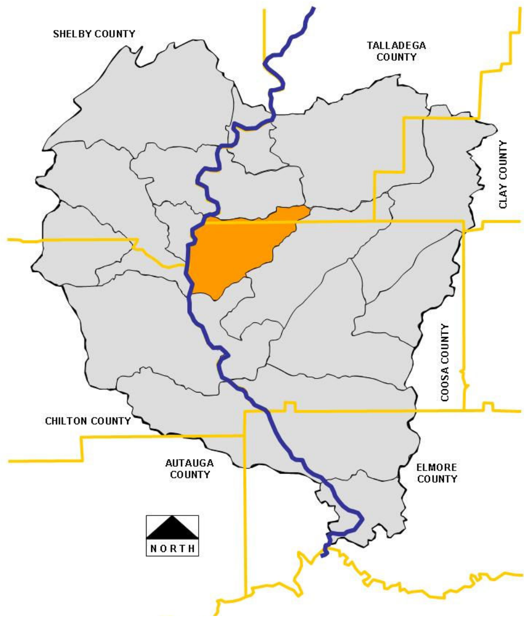
Sediment Loads (in tons)

Total	96,114
Cropland	388
Sand & Gravel Pits	7,000
Mined Land	18,000
Developing Urban Land	4,000
Gullies	3,640
Critical Areas	7,250
Streambanks	25,440
Dirt Roads and Banks	9,780
Woodland	20,616

Water Users

Public Water Supply	0
Total Permitted Dischargers	0
Municipal	0
Industrial	0
Mining	0

Peckerwood Creek Watershed Location Map



Impaired Water Bodies .... Lay Lake

Active Water Quality Monitoring Sites........................ 0

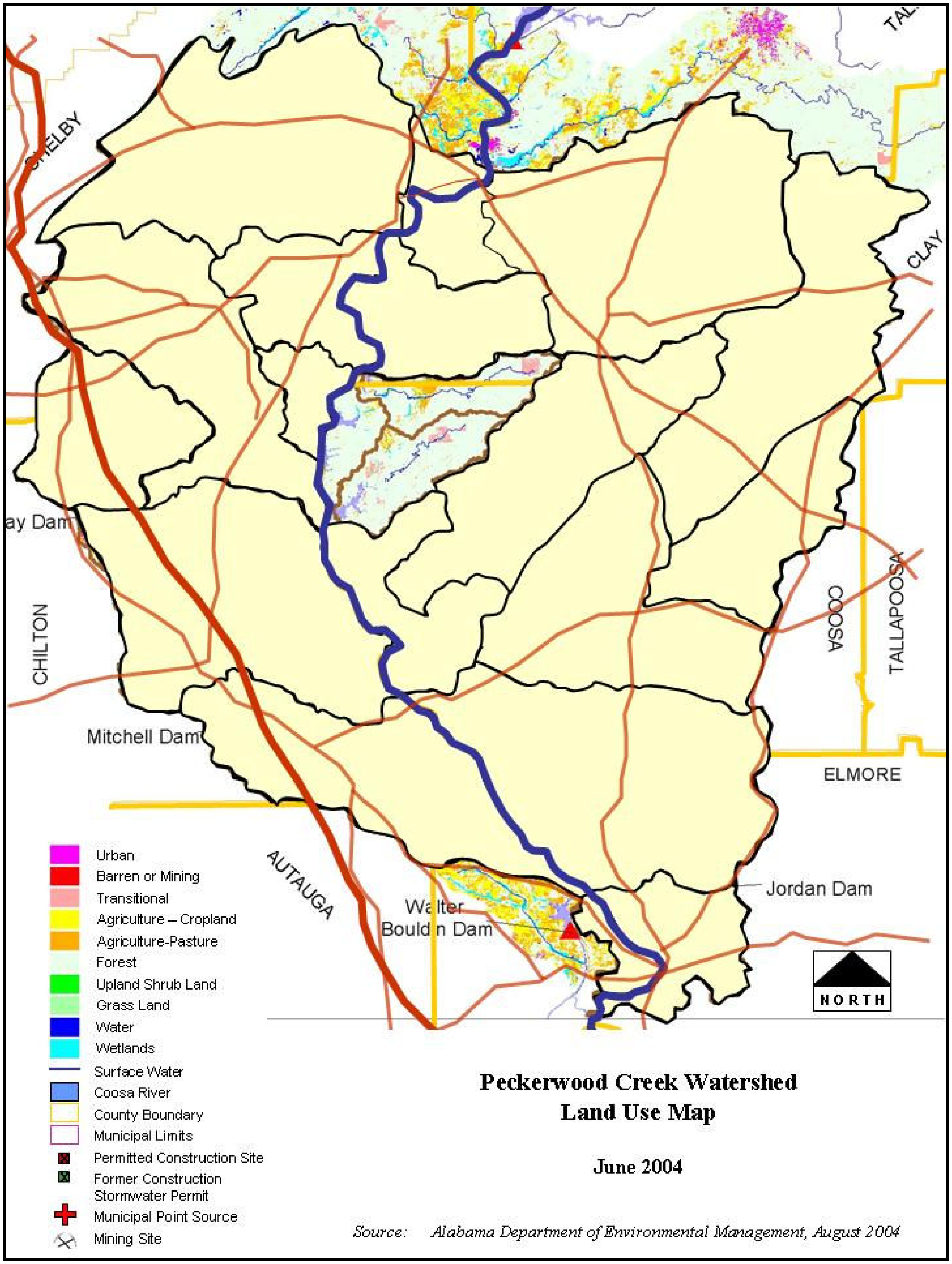
Suitability for Development...................................Poor

2005 Priority Watershed Rating.............................Low

Major Contributing Factors

- Impaired Waterbodies
- Alabama Water Watch Water Quality Monitoring and Results
- Presence of a Hydroelectric Dam
- Potential for Silviculture
- Soil Suitability for Development
- Septic System Density
- Number of Endangered Species
- 2000 Unemployment Rate

Land Use – 070



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Municipal Point Source
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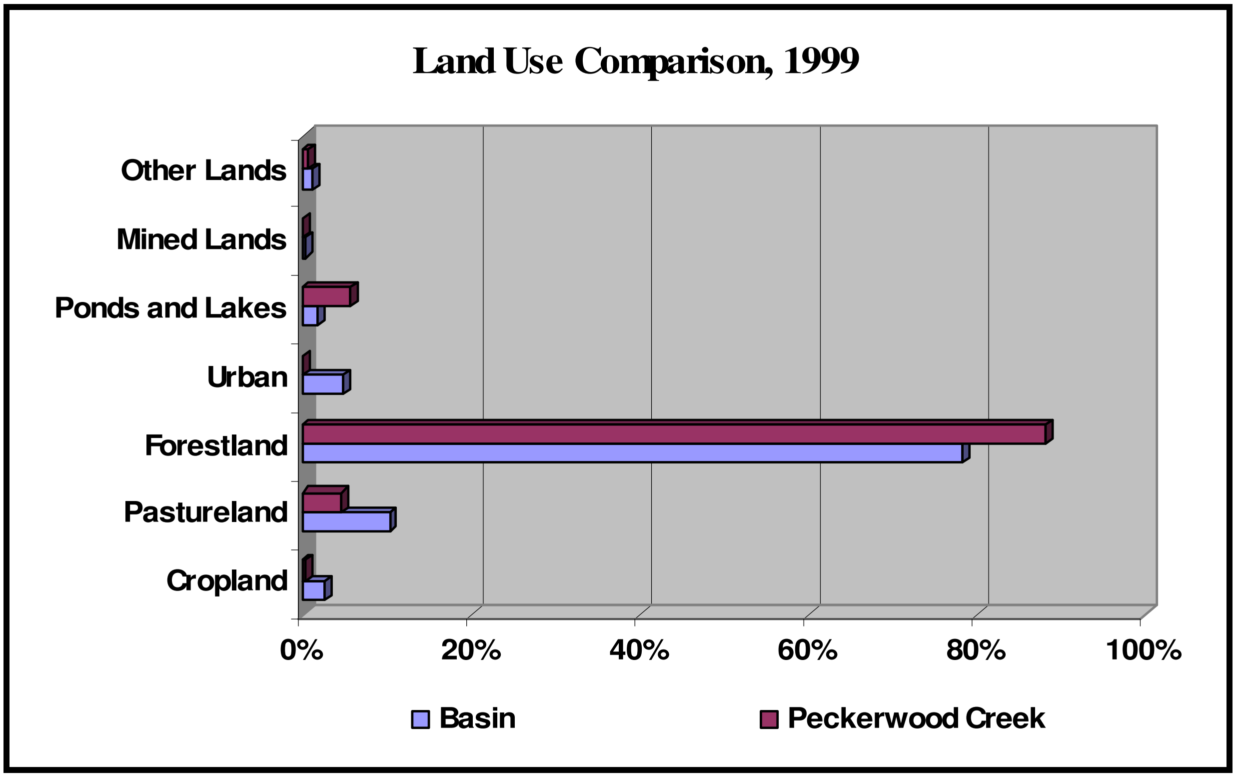
Peckerwood Creek Watershed
Land Use Map
June 2004
Source: Alabama Department of Environmental Management, August 2004



Land Use Patterns

The Peckerwood Creek watershed has a forestland character, with 88 percent of the land in forest land uses, as compared to 78 percent of the basin overall. There is essentially no urban or crop land uses within the watershed at only 73 acres and 162 acres, respectively. There is a small degree of pasture land uses which comprise 5 percent of the total land use in the watershed. These agricultural uses are found in the north central part of the basin. It is estimated that there are 660 head of cattle, eight swine and 170 acres of catfish farms in the watershed. The remainder of the watershed is essentially wooded land. Of the total amount of forested land in the watershed, deciduous forest comprises 39.71 percent, which is comparable with the entire basin, at 40.58 percent. There is high probability that there is active silviculture in the basin due to a high percentage of evergreen and mixed forest, which accounts for the remaining 60.29 percent of the forest land

The Peckerwood Creek watershed has a relatively low production of sediment, estimated at 1.81 tons per acre. The source of the greatest amount of sediment is from streambanks. It is also estimated that there are 150 septic systems in the watershed, with a failure rate of approximately 3.3 percent.

There are no major roads providing direct access to the Peckerwood Creek watershed, however, U.S. Highway 280 and U.S. Highway 231 are located northeast of the watershed. The only direct access into and around the watershed is by local county roads.

Soils and Species – 070

The Peckerwood Creek watershed is comprised of soils in three soil associations: the Decatur-Dewey-Allen Association, the Montevallo-Townley-Enders and the Tallapoosa-Tatum Association. The Montevallo-Townley-Enders soils are located along the Coosa River in the northwestern part of the watershed. The Decatur-Dewey-Allen soils are located in the north central part of the watershed. The Tallapoosa-Tatum soils, the predominant soil association, is located in the eastern half of the watershed. The soil suitability and limitations for selected uses are provided in the table below. For a map of the soil associations in the watershed and in the Lower Coosa River Basin, refer to the Soil Association Map on page 9.

Soil Association Number	6	16	25
Soil Association	**Decatur-Dewey-Allen**	**Montevallo-Townley-Enders**	**Tallapoosa-Tatum**
Dominant Slope, %	1 - 10	6 - 40	6 - 50
Soil Suitability and Major Limitations For:			
Cropland	Good	Poor: slope, depth to rock	Poor: slope, droughty
Pastureland	Good	Poor: slope, droughty	Poor: slope
Woodland	Good	Poor: depth to rock	Good
Soil Limitations For:			
Septic Systems	Slight	Severe: slope, depth to rock	Severe: slope, depth to bedrock
Local Roads and Streets	Moderate: low strength	Severe: slope	Severe: slope
Small Commercial Buildings	Moderate	Severe: slope	Severe: slope
Dwellings without Basements	Moderate	Severe: slope	Severe: slope
Camp Areas	Slight	Severe: slope	Severe: slope
Picnic Areas	Slight	Severe: slope	Severe: slope
Playgrounds	Slight	Severe: slope, depth to rock	Severe: slope
Paths and Trails	Slight	Severe: slope	Severe: slope

The Peckerwood Creek watershed is located in two Level III Ecoregions. The northwestern corner of the watershed is in the Ridge and Valley and the remainder of the watershed is in the Piedmont. The Ridge and Valley Ecoregion is further divided into three sub-ecoregions with the watershed: the Southern Shale Valleys, the Southern Dissected Ridges and Knobs, and the Southern Limestone / Dolomite Valleys and Low Rolling Hills. In addition to the protected species found throughout the Lower Coosa River Basin (listed on page 14), the following protected species are found in the Peckerwood Creek watershed.

Common Name	Scientific Name	Distribution in Lower Coosa River Basin
Coldwater Darter	*Etheostoma ditrema*	(1) Spring-dwelling race-Shelby to Coosa Counties (2) Stream race-Waxahatchee Creek tribs, Shelby County; Coosa River tribs, Coosa County
Bachman's Sparrow	*Aimophila aestivalis*	Coastal Plain and Piedmont province
Bald Eagle	*Haliaeetus leucocephalus*	Coastal Plain and Piedmont province
Meadow Jumping Mouse	*Zapus hudsonius*	Chilton, Coosa and Elmore Counties
Mud Elimia	*Elimia alabamensis*	Shelby, Talladega, Chilton, Coosa Counties
Stocky Pebblesnail	*Somatogyrus crassus*	Main stem - Elmore, Chilton, Coosa Counties. May be extinct.
Hidden Pebblesnail	*Somatogyrus decipiens*	Chilton, Coosa Counties. May be extinct.
Fluted Pebblesnail	*Somatogyrus hendersoni*	Main stem, Coosa, Chilton Counties. May be extinct.
Moon Pebblesnail	*Somatogyrus obtusus*	Chilton-Coosa County shoals
Nevius Stonecrop	*Sedum nevii*	Chilton, Coosa, Talladega Counties
Horse-nettle	*Solanum carolinense* var. *hirsutum*	Chilton, Coosa Counties

Demographics – 070

Population - Urban / Rural	Number	Percent
Total Population	881	100.00%
Urban	5	0.60%
Rural	875	99.40%
Farm	25	2.88%
Nonfarm	850	97.12%

Population By Race	Number	Percent
Total Population	881	100.00%
White	814	92.39%
Black	49	5.55%
American Indian / Alaskan	13	1.52%
Asian	0	0.00%
Native Hawaiian / Pacific Isl.	0	0.00%
Some Other Race	5	0.54%
Two or More Races	0	0.00%

Population By Age	Number	Percent
Total Population	881	100.00%
Under 18	214	24.25%
18 to 29 Years	128	14.56%
30 to 49 Years	251	28.45%
50 to 64 Years	176	19.96%
65 Years and Older	113	12.77%

Population in Households	Number	Percent
Total Population	881	100.00%
Population In households	878	99.64%
In Family Households	805	91.76%
In NonFamily Households	72	8.24%
In Group Quarters	3	0.36%
Institutionalized	3	100.00%
Noninstitutionalized	0	0.00%

Educational Attainment	Number	Percent
Total Population (25 & Over)	614	100.00%
No schooling completed	6	0.92%
Some School, No Diploma	176	28.60%
High School Graduate, GED	262	42.73%
Some College, No Degree	101	16.45%
Associate degree	19	3.14%
Bachelor's degree	39	6.31%
Master's degree	8	1.37%
Professional school degree	1	0.12%
Doctorate degree	2	0.34%

Place of Birth	Number	Percent
Total	881	100.00%
Native	877	99.55%
Born in Alabama	756	86.18%
Born in Northeast	2	0.28%
Born in Midwest	25	2.87%
Born in South	81	9.29%
Born in West	10	1.10%
Born outside US	3	0.29%
Foreign Born	4	0.45%
Naturalized citizen	3	68.75%
Not a citizen	1	31.25%

Residence in 1995	Number	Percent
Total Population (5 and Over)	819	100.00%
Same house in 1995	534	65.18%
Different house in 1995	285	34.82%
In United States in 1995	285	99.82%
Same County	133	46.66%
Different county	152	53.34%
Different county; Same state	131	46.01%
Different state	21	7.34%
Different state; Northeast	0	0.00%
Different state; Midwest	3	14.35%
Different state; South	18	85.65%
Different state; West	0	0.00%
Elsewhere	1	0.18%

Economics and Employment – 070

Median Family Income, 1999	$34,111
Median Household Income, 1999	$30,136
Median Per Capita Income, 1999	$16,611

Employment Status	Number	Percent
Population (16 and over)	683	100.00%
In labor force	388	56.75%
In Armed Forces	4	1.11%
Civilian	383	98.89%
Civilian; Employed	360	93.75%
Civilian; Unemployed	24	6.25%
Not in labor force	295	43.25%

Place of Work	Number	Percent
Workers (16 and over)	347	100.00%
Worked in Alabama	347	100.00%
In county of residence	168	48.45%
Outside county of residence	179	51.55%
Worked outside Alabama	0	0.00%

Transportation To Work	Number	Percent
Workers (16 and Over)	347	100.00%
Car; truck; or van	341	98.40%
Drove alone	307	90.08%
Carpooled	34	9.92%
Public transportation	0	0.00%
Motorcycle	0	0.00%
Bicycle	0	0.00%
Walked	3	0.81%
Other means	0	0.00%
Worked at home	3	0.79%

Travel Time to Work	Number	Percent
Total Workers (16 and over)	347	100.00%
Did Not Work at Home	344	99.21%
Less than 5 minutes	3	0.81%
5 to 9 minutes	26	7.48%
10 to 14 minutes	41	11.97%
15 to 19 minutes	75	21.83%
20 to 24 minutes	62	17.96%
25 to 29 minutes	10	3.04%
30 to 34 minutes	55	15.88%
35 to 39 minutes	16	4.50%
40 to 44 minutes	9	2.60%
45 to 59 minutes	16	4.65%
60 to 89 minutes	25	7.29%
90 or more minutes	7	1.98%
Worked at Home	3	0.79%

Employment By Industry	Number	Percent
Employed, 16 and Over	360	100.00%
Agri; Forestry; Fish/Hunt	3	0.72%
Mining	12	3.37%
Construction	32	8.87%
Manufacturing	85	23.64%
Wholesale Trade	22	6.02%
Retail Trade	48	13.34%
Transportation/Warehousing	17	4.85%
Utilities	4	1.17%
Information	3	0.70%
Finance and Insurance	3	0.86%
Real Estate	0	0.00%
Prof; Scientific; Tech Svcs	13	3.64%
Mgmt of Companies/Ent	0	0.00%
Admin; Waste Mgmt Svcs	3	0.70%
Educational Services	23	6.47%
Health Care/Social Assist.	32	8.83%
Arts; Entertainment; Rec	4	1.04%
Accommodation/Food Svcs	27	7.55%
Public Administration	15	4.26%
Other Services	14	3.96%

Housing – 070

Median Year Structure Built	1978

Housing	Number	Percent
Total Housing Units	479	100.00%
Urban	2	0.42%
Rural	477	99.58%

Housing Occupancy	Number	Percent
Total	479	100.00%
Occupied	354	73.86%
Owner Occupied	316	89.40%
Renter Occupied	38	10.60%
Vacant	6	4.39%
For Rent	1	1.00%
For Sale Only	2	1.60%
Rented or Sold;	92	73.21%
For Seasonal Use	0	0.00%
For Migrant Workers	25	19.80%
Other vacant	6	4.39%

Household Size	Number	Percent
Total Occupied Housing Units	354	100.00%
1-person household	65	18.31%
2-person household	133	37.55%
3-person household	76	21.35%
4-person household	57	16.16%
5-person household	19	5.40%
6-person household	1	0.14%
7-or-more-person household	4	1.09%

Average Household Size	# Persons
All Housing Units	2.50
Owner occupied	2.54
Renter occupied	2.13

Units & Rooms in Structure	Number	Percent
Housing units: Total	479	100.00%
1 Unit - Detached	308	64.22%
1 Unit - Attached	1	0.16%
2 units in structure	0	0.00%
3 or 4 units in structure	0	0.00%
5 to 9 units in structure	0	0.00%
10 to 19 units in structure	0	0.00%
20 to 49 units in structure	0	0.00%
50 or more units in structure	0	0.00%
Mobile home	170	35.52%
Boat; RV; van; etc.	1	0.10%
Median number of rooms		5.35

House Heating Fuel	Number	Percent
Total Occupied Housing Units	354	100.00%
Utility gas	25	7.08%
Bottled; tank; or LP gas	174	49.12%
Electricity	144	40.82%
Fuel oil; kerosene; etc.	0	0.00%
Coal or coke	0	0.00%
Wood	11	2.98%
Solar energy	0	0.00%
Other fuel	0	0.00%
No fuel used	0	0.00%

Telephone Service	Number	Percent
Total Occupied Housing Units	354	100.00%
Telephone Service Available	344	97.10%
No Telephone Service Available	10	2.90%

Vehicles Available	Number	Percent
Total Occupied Housing Units	354	100.00%
No vehicle available	28	7.78%
1 vehicle available	68	19.34%
2 vehicles available	147	41.48%
3 vehicles available	83	23.38%
4 vehicles available	14	3.83%
5 or more vehicles available	15	4.18%

Plumbing Facilities	Number	Percent
Total Housing Units	479	100.00%
Complete plumbing facilities	476	99.37%
Lacking complete plumbing facilities	3	0.63%

Kitchen Facilities	Number	Percent
Total Housing Units	479	100.00%
Complete kitchen facilities	477	99.48%
Lacking complete kitchen facilities	3	0.52%

Rating and Issues – 070

Criteria	Rating
Impaired Water Bodies	5
ADEM Basin Assessment Rating for NPS Potential	1
NRCS Priority Watershed	3
AWW Water Quality Monitoring and Results	5
Use Classification	1
Land Use Character	1
Potential for Silviculture	4
Sediment Loads	1
Animal Density	1
Soil Suitability for Development	4
Growth Rate of County	2
Increase in Traffic Volume	1
Number of Permitted Dischargers	1
Presence of Hydroelectric Dam	5
Housing Density	2
Septic System Density	4
Number of Endangered Species	4
2000 Unemployment Rate	4
Total	**49 Low**

With a rating score of 49, the Beeswax Creek watershed is considered to be a low priority watershed in the Lower Coosa River Basin. For more information on the watershed rating and ranking system, refer to the *Lower Coosa River Basin Management Plan*, Part IV, Chapter 12: Priority Watersheds.

A total of 23 issues were identified in the Lower Coosa River Basin. Of these, 12 are present in the Peckerwood Creek watershed, of which five are basinwide issues, and seven are regional issues. The focus of the regional watershed management measures for this watershed is water quality improvement and mitigation of silviculture runoff.

Refer to the Lower Coosa River Basin Management Plan, Part IV, Chapter 14: Water Quality Improvement Strategy for management measures that may be implemented in this watershed.

Basinwide Issues:
- Endangered Species
- Lack of Water Quality Trend Data
- Illegal Dumping
- Lack of Education and Awareness
- FERC Relicensing of Hydroelectric Facilities

Regional Issues:
- Sivlicuture Runoff
- Nutrients, Algae and Invasive Species
- Low Dissolved Oxygen
- Upstream Contamination
- Temperature and Thermal Stress
- Priority Organics
- Mining Runoff

Spring Creek Watershed
HUC: 03150107-080

Watershed Area:	14,511 ac.
Percent of Basin:	1.16%
Type:	Urban
County-Headwaters:	Shelby
County-Mouth:	Shelby
Municipalities:	None
Total Population:	1,911
Percent of Basin:	1.74%

Land Use

Lakes and Ponds	380 ac
Cropland	350 ac
Pastureland	2,800 ac
Forestland	8,781 ac
Urbanized	2,200 ac
Mined Land	0 ac
Other Land	0 ac

Animal Data

Cattle	700
Dairy	0
Swine	0
Broilers	0
Layers	0
Catfish Acres	5

Domestic Water Data

Septic Tanks	1,000
Failing Septic Tanks	30
Alternative Systems	15

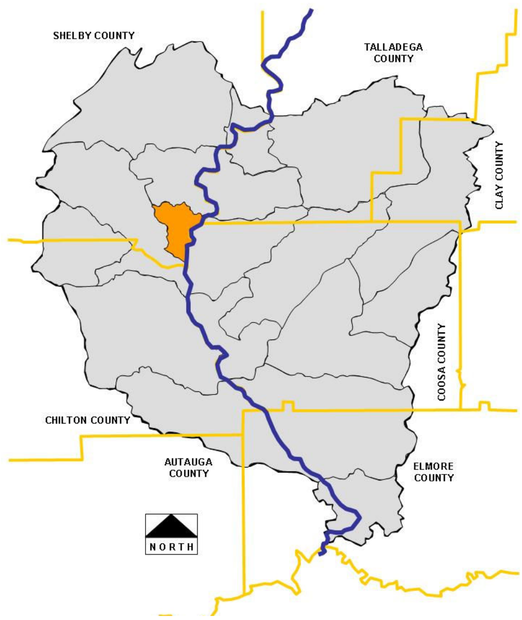
Sediment Loads (in tons)

Total	202,388
Cropland	945
Sand & Gravel Pits	0
Mined Land	0
Developing Urban Land	132,000
Gullies	0
Critical Areas	25,500
Streambanks	1,100
Dirt Roads and Banks	12,000
Woodland	30,843

Water Users

Public Water Supply	0
Total Permitted Dischargers	1
Municipal	0
Industrial	1
Mining	0

Spring Creek Watershed Location Map



Impaired Water Bodies.................................. Lay Lake

Active Water Quality Monitoring Sites........................ 0

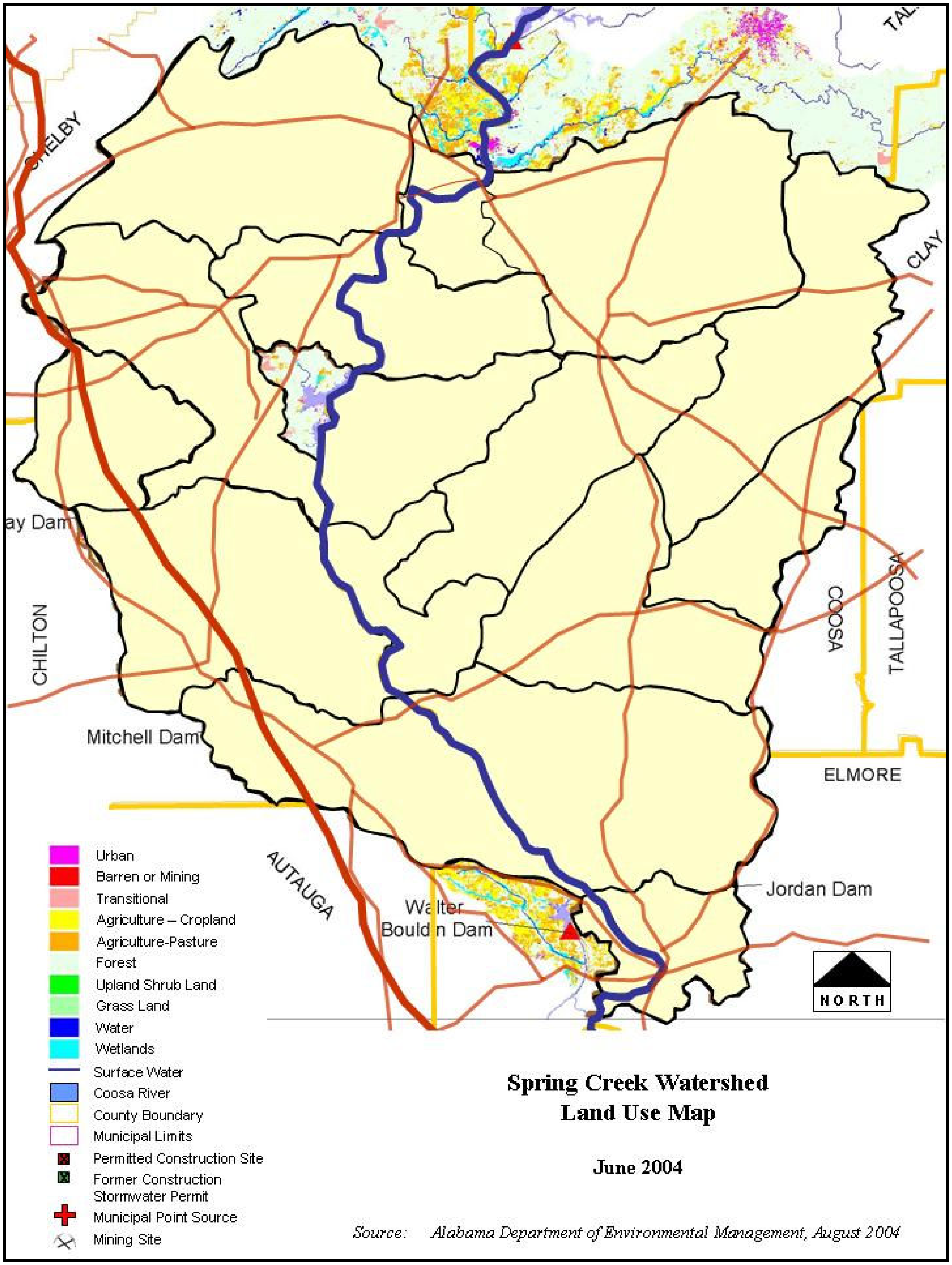
Suitability for Development........................... Moderate

2005 Priority Watershed Rating............................ High

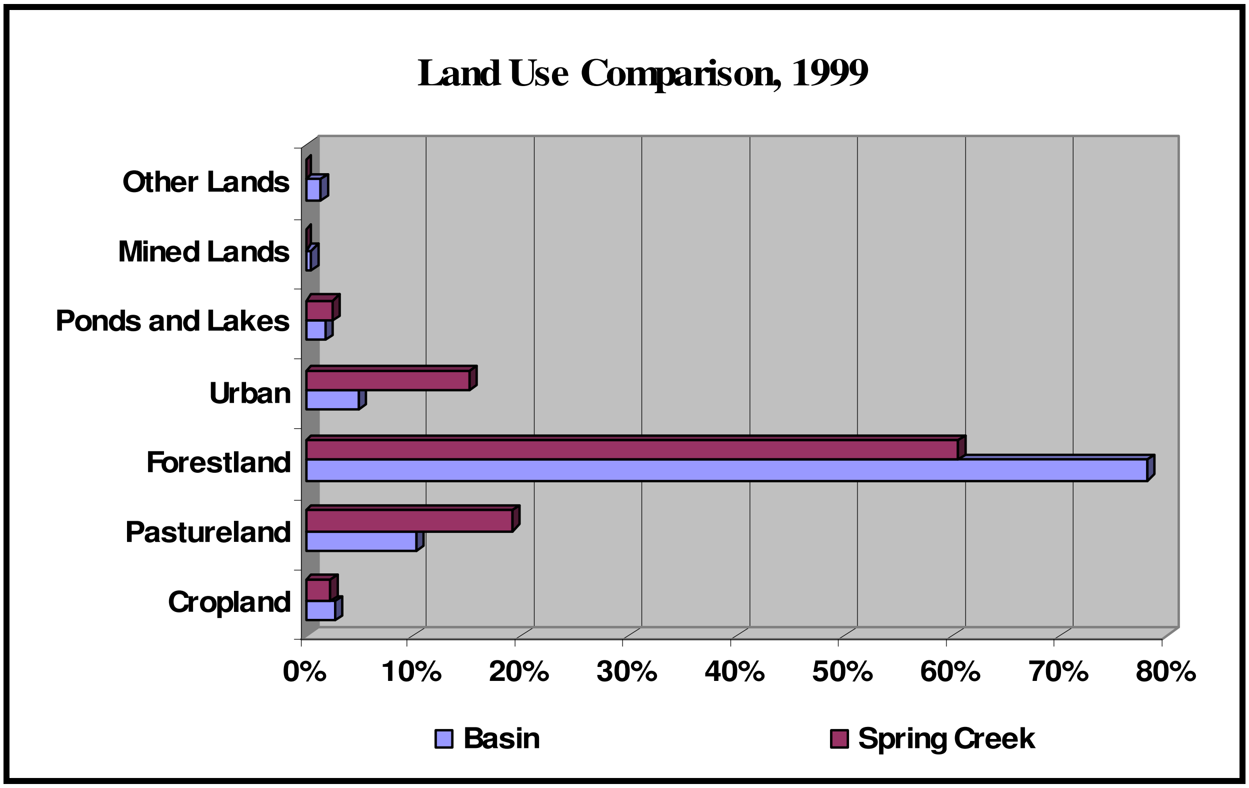
Major Contributing Factors

- Impaired Waterbodies
- Alabama Water Watch Water Quality Monitoring and Results
- Urban Land Uses
- Potential for Silviculture
- Growth Rate of County
- Housing Density
- Septic System Density
- High 2000 Unemployment Rate

Land Use – 080



SHELBY
CLAY
CHILTON
COOSA
TALLAPOOSA
ELMORE
AUTAUGA
ay Dam
Mitchell Dam
Jordan Dam
Walter Bouldin Dam
NORTH
Urban
Barren or Mining
Transitional
Agriculture – Cropland
Agriculture-Pasture
Forest
Upland Shrub Land
Grass Land
Water
Wetlands
Surface Water
Coosa River
County Boundary
Municipal Limits
Permitted Construction Site
Former Construction Stormwater Permit
Municipal Point Source
Mining Site
Spring Creek Watershed
Land Use Map
June 2004
Source: Alabama Department of Environmental Management, August 2004



Land Use Patterns

The Spring Creek watershed is urban in character, with 15 percent of the land in urban land uses, as compared with 5 percent of the land in the Lower Coosa River Basin in urban use. Urban land uses are primarily concentrated along the western boundary as well as residential uses around Lake Mitchell. Additionally, there are four marinas in the watershed, of which three are active. There are approximately 1,000 septic systems in the watershed, with a 3 percent failure rate. Agricultural land uses comprise 21 percent of the watershed, of which 2 percent is crop land. The remaining 19 percent of the agricultural land use is pasture land. It is estimated that there are 700 head of cattle and five acres of catfish ponds in the watershed. These land uses are found sporadically throughout the basin and do not provide a defined pattern of land use. The amount of land used for forest purposes in the watershed is relatively low, at 61 percent, as compared to 78 percent for the basin overall. The percentage of deciduous forest in the watershed, at 29.07 percent of the total forest land, is the fourth lowest of the 20 watersheds. The remaining 70.93 percent of the forest land is comprised on evergreen and mixed forests, indicating a high probability of active silviculture throughout the watershed. The Spring Creek watershed has the third highest production of sediment of the 20 watersheds in the basin, at 13.95 tons per acre. The greatest source of sediment is developing land uses which accounts for 9.10 tons per acre.

Access through the watershed is available via State Highway 145, which runs north-south in the western half of the watershed. Significant traffic increases south of the watershed and moderate traffic increases north of the watershed indicate a strong possibility that the Spring Creek watershed has experienced a substantial increase in traffic as well, especially given the urban character of the watershed.

Soils and Species – 080

The Spring Creek watershed is comprised of soils in two soil associations: the Decatur-Dewey-Allen Association and the Montevallo-Townley-Enders Association. Soils in the Decatur-Dewey-Allen Association are found in the northwestern corner of the watershed. The remaining eastern and southern portion of the watershed is comprised of soils in the Montevallo-Townley-Enders Association. The soil suitability and limitations for selected uses are provided in the table below. For a map of the soil associations in the watershed and in the Lower Coosa River Basin, refer to the Soil Association Map on page 9.

Soil Association Number	6	16
Soil Association	**Decatur-Dewey-Allen**	**Montevallo-Townley-Enders**
Dominant Slope, %	1 - 10	6 - 40
Soil Suitability and Major Limitations For:		
Cropland	Good	Poor: slope, depth to rock
Pastureland	Good	Poor: slope, droughty
Woodland	Good	Poor: depth to rock
Soil Limitations For:		
Septic Systems	Slight	Severe: depth to rock, slope
Local Roads and Streets	Moderate: low strength	Severe: slope
Small Commercial Buildings	Moderate	Severe: slope
Dwellings without Basements	Moderate	Severe: slope
Camp Areas	Slight	Severe: slope
Picnic Areas	Slight	Severe: slope
Playgrounds	Slight	Severe: slope, depth to rock
Paths and Trails	Slight	Severe: slope

The Spring Creek watershed is located in two Level III Ecoregions. The northern two-thirds of the watershed is in the Ridge and Valley and the southern tip of the watershed is in the Piedmont. There are two Level IV Sub-Ecoregions located in the watershed: the Southern Shale Valleys and the Southern Limestone / Dolomite Valleys and Low Rolling Hills. In addition to the protected species found throughout the Lower Coosa River Basin (listed on page 14), the following protected species are found in the Spring Creek watershed.

Common Name	Scientific Name	Distribution in Lower Coosa River Basin
Coldwater Darter	*Etheostoma ditrema*	(1) Spring-dwelling race-Shelby to Coosa Counties (2) Stream race-Waxahatchee Creek tribs, Shelby County; Coosa River tribs, Coosa County
Dusky Gopher Frog	*Rana capito sevosa*	Shelby County
Bald Eagle	*Haliaeetus leucocephalus*	Coastal Plain and Piedmont province
Bachman's Sparrow	*Aimophila aestivalis*	Coastal Plain and Piedmont province
Appalachian Bewick's wren	*Thryomanes bewickii altus*	North of the Fall Line, particularly in Ridge and Valley province
Mud Elimia	*Elimia alabamensis*	Shelby, Talladega, Chilton, Coosa Counties
Shoals Spiderlily	*Hymenoccallis coronaria*	Shelby County
Running Post Oak	*Quercus boyntonii*	Ridge and Valley Province of Shelby County

Demographics – 080

Population - Urban / Rural	Number	Percent
Total Population	1,911	100.00%
Urban	0	0.00%
Rural	1,911	100.00%
Farm	32	1.66%
Nonfarm	1,880	98.34%

Population By Race	Number	Percent
Total Population	1,911	100.00%
White	1,821	95.26%
Black	78	4.07%
American Indian / Alaskan	5	0.25%
Asian	0	0.00%
Native Hawaiian / Pacific Isl.	0	0.00%
Some Other Race	8	0.42%
Two or More Races	0	0.00%

Population By Age	Number	Percent
Total Population	1,911	100.00%
Under 18	406	21.25%
18 to 29 Years	282	14.74%
30 to 49 Years	585	30.61%
50 to 64 Years	422	22.06%
65 Years and Older	217	11.36%

Population in Households	Number	Percent
Total Population	1,911	100.00%
Population In households	1,911	100.00%
In Family Households	1,695	88.68%
In NonFamily Households	216	11.32%
In Group Quarters	0	0.00%
Institutionalized	0	0.00%
Noninstitutionalized	0	0.00%

Educational Attainment	Number	Percent
Total Population (25 & Over)	1,345	100.00%
No schooling completed	11	0.78%
Some School, No Diploma	213	15.87%
High School Graduate, GED	550	40.87%
Some College, No Degree	337	25.05%
Associate degree	50	3.69%
Bachelor's degree	123	9.13%
Master's degree	50	3.74%
Professional school degree	11	0.81%
Doctorate degree	1	0.07%

Place of Birth	Number	Percent
Total	1,911	100.00%
Native	1,903	99.54%
Born in Alabama	1,487	78.17%
Born in Northeast	40	2.10%
Born in Midwest	60	3.13%
Born in South	283	14.88%
Born in West	19	1.00%
Born outside US	14	0.72%
Foreign Born	9	0.46%
Naturalized citizen	0	0.00%
Not a citizen	9	100.00%

Residence in 1995	Number	Percent
Total Population (5 and Over)	1,816	100.00%
Same house in 1995	1,182	65.10%
Different house in 1995	634	34.90%
In United States in 1995	628	99.13%
Same County	355	56.53%
Different county	273	43.47%
Different county; Same state	181	28.86%
Different state	92	14.61%
Different state; Northeast	10	11.12%
Different state; Midwest	11	11.44%
Different state; South	65	70.90%
Different state; West	6	6.54%
Elsewhere	6	0.87%

Economics and Employment – 080

Median Family Income, 1999	$48,949
Median Household Income, 1999	$41,747
Median Per Capita Income, 1999	$20,258

Employment Status	Number	Percent
Population (16 and over)	1,550	100.00%
In labor force	987	63.70%
In Armed Forces	0	0.00%
Civilian	987	100.00%
Civilian; Employed	905	91.67%
Civilian; Unemployed	82	8.33%
Not in labor force	563	36.30%

Place of Work	Number	Percent
Workers (16 and over)	877	100.00%
Worked in Alabama	867	98.79%
In county of residence	525	60.54%
Outside county of residence	342	39.46%
Worked outside Alabama	11	1.21%

Transportation To Work	Number	Percent
Workers (16 and Over)	877	100.00%
Car; truck; or van	841	95.89%
Drove alone	748	88.96%
Carpooled	93	11.04%
Public transportation	0	0.00%
Motorcycle	0	0.00%
Bicycle	0	0.00%
Walked	3	0.37%
Other means	6	0.63%
Worked at home	27	3.11%

Travel Time to Work	Number	Percent
Total Workers (16 and over)	877	100.00%
Did Not Work at Home	850	96.89%
Less than 5 minutes	7	0.79%
5 to 9 minutes	66	7.80%
10 to 14 minutes	38	4.46%
15 to 19 minutes	32	3.75%
20 to 24 minutes	69	8.15%
25 to 29 minutes	48	5.68%
30 to 34 minutes	100	11.74%
35 to 39 minutes	45	5.25%
40 to 44 minutes	53	6.19%
45 to 59 minutes	120	14.09%
60 to 89 minutes	230	27.00%
90 or more minutes	43	5.10%
Worked at Home	27	3.11%

Employment By Industry	Number	Percent
Employed, 16 and Over	905	100.00%
Agri; Forestry; Fish/Hunt	8	0.84%
Mining	5	0.53%
Construction	137	15.08%
Manufacturing	181	20.05%
Wholesale Trade	37	4.07%
Retail Trade	90	9.99%
Transportation/Warehousing	39	4.36%
Utilities	18	2.01%
Information	26	2.87%
Finance and Insurance	47	5.22%
Real Estate	11	1.26%
Prof; Scientific; Tech Svcs	33	3.62%
Mgmt of Companies/Ent	0	0.00%
Admin; Waste Mgmt Svcs	26	2.83%
Educational Services	89	9.79%
Health Care/Social Assist.	63	6.92%
Arts; Entertainment; Rec	5	0.53%
Accommodation/Food Svcs	18	2.02%
Public Administration	38	4.19%
Other Services	35	3.83%

Housing – 080

Median Year Structure Built	1981

Housing	Number	Percent
Total Housing Units	1,226	100.00%
Urban	0	0.00%
Rural	1,226	100.00%

Housing Occupancy	Number	Percent
Total	1,226	100.00%
Occupied	765	62.40%
Owner Occupied	681	89.03%
Renter Occupied	84	10.97%
Vacant	461	37.06%
For Rent	14	3.01%
For Sale Only	21	4.55%
Rented or Sold;	5	1.13%
For Seasonal Use	389	84.46%
For Migrant Workers	0	0.00%
Other vacant	32	6.86%

Household Size	Number	Percent
Total Occupied Housing Units	765	100.00%
1-person household	160	20.87%
2-person household	321	42.02%
3-person household	138	18.09%
4-person household	80	10.40%
5-person household	48	6.24%
6-person household	10	1.32%
7-or-more-person household	8	1.06%

Average Household Size	# Persons
All Housing Units	2.52
Owner occupied	2.53
Renter occupied	2.55

Units & Rooms in Structure	Number	Percent
Housing units: Total	1,226	100.00%
1 Unit - Detached	612	49.95%
1 Unit - Attached	0	0.00%
2 units in structure	7	0.57%
3 or 4 units in structure	21	1.67%
5 to 9 units in structure	2	0.16%
10 to 19 units in structure	2	0.16%
20 to 49 units in structure	0	0.00%
50 or more units in structure	0	0.00%
Mobile home	573	46.75%
Boat; RV; van; etc.	9	0.73%
Median number of rooms		5.37

House Heating Fuel	Number	Percent
Total Occupied Housing Units	765	100.00%
Utility gas	85	11.05%
Bottled; tank; or LP gas	197	25.81%
Electricity	468	61.19%
Fuel oil; kerosene; etc.	0	0.00%
Coal or coke	1	0.13%
Wood	3	0.39%
Solar energy	0	0.00%
Other fuel	11	1.43%
No fuel used	0	0.00%

Telephone Service	Number	Percent
Total Occupied Housing Units	765	100.00%
Telephone Service Available	740	96.79%
No Telephone Service Available	25	3.21%

Vehicles Available	Number	Percent
Total Occupied Housing Units	765	100.00%
No vehicle available	26	3.37%
1 vehicle available	172	22.45%
2 vehicles available	377	49.31%
3 vehicles available	135	17.66%
4 vehicles available	42	5.45%
5 or more vehicles available	13	1.75%

Plumbing Facilities	Number	Percent
Total Housing Units	1,226	100.00%
Complete plumbing facilities	1,215	99.17%
Lacking complete plumbing facilities	10	0.83%

Kitchen Facilities	Number	Percent
Total Housing Units	1,226	100.00%
Complete kitchen facilities	1,215	99.17%
Lacking complete kitchen facilities	10	0.83%

Rating and Issues – 080

Criteria	Rating
Impaired Water Bodies	5
ADEM Basin Assessment Rating for NPS Potential	1
NRCS Priority Watershed	1
AWW Water Quality Monitoring and Results	5
Use Classification	1
Land Use Character	
Potential for Silviculture	5
Sediment Loads	5
Animal Density	4
Soil Suitability for Development	3
Growth Rate of County	5
Increase in Traffic Volume	3
Number of Permitted Dischargers	2
Presence of Hydroelectric Dam	1
Housing Density	5
Septic System Density	5
Number of Endangered Species	4
2000 Unemployment Rate	5
Total	**65 High**

With a rating score of 65, the Spring Creek watershed is considered to be a high priority watershed in the Lower Coosa River Basin. For more information on the watershed rating and ranking system, refer to the *Lower Coosa River Basin Management Plan*, Part IV, Chapter 12: Priority Watersheds.

A total of 23 issues were identified in the Lower Coosa River Basin. Of these, 14 are present in the Spring Creek watershed, of which five are basinwide issues, and nine are regional issues. The focus of the regional watershed management measures for this watershed is managing growth and development pressures, mitigating stormwater runoff and water quality improvement.

Refer to the Lower Coosa River Basin Management Plan, Part IV, Chapter 14: Water Quality Improvement Strategy for management measures that may be implemented in this watershed.

Basinwide Issues:

- Endangered Species
- Lack of Water Quality Trend Data
- Illegal Dumping
- Lack of Education and Awareness
- FERC Relicensing of Hydroelectric Facilities

Regional Issues:

- Growth Rate and Urban Development
- Agricultural Runoff
- Sivlículture Runoff
- Urban Runoff
- Sedimentation
- Nutrients, Algae and Invasive Species
- Low Dissolved Oxygen
- Upstream Contamination
- Priority Organics

Buxahatchee Creek Watershed

HUC: 03150107-090

Watershed Area:	44,551 ac.
Percent of Basin:	3.56%
Type:	Forest
County-Headwaters:	Chilton
County-Mouth:	Shelby
Municipalities:	Calera
Total Population:	4,118
Percent of Basin:	3.75%

Land Use

Lakes and Ponds	282 ac
Cropland	1,050 ac
Pastureland	4,200 ac
Forestland	37,040 ac
Urbanized	890 ac
Mined Land	180 ac
Other Land	909 ac

Animal Data

Cattle	1,150
Dairy	0
Swine	0
Broilers	0
Layers	0
Catfish Acres	12

Domestic Water Data

Septic Tanks	700
Failing Septic Tanks	206
Alternative Systems	10

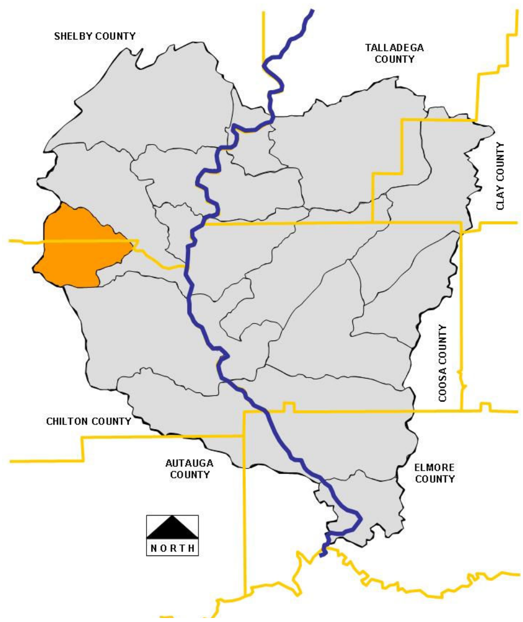
Sediment Loads (in tons)

Total	358,579
Cropland	3,555
Sand & Gravel Pits	15,750
Mined Land	45,000
Developing Urban Land	169,500
Gullies	51,800
Critical Areas	21,500
Streambanks	5,750
Dirt Roads and Banks	24,000
Woodland	21,724

Water Users

Public Water Supply	0
Total Permitted Dischargers	10
Municipal	1
Industrial	9
Mining	0

Buxahatchee Creek Watershed Location Map



Impaired Water Bodies....................Buxahatchee Creek

Active Water Quality Monitoring Sites........................0

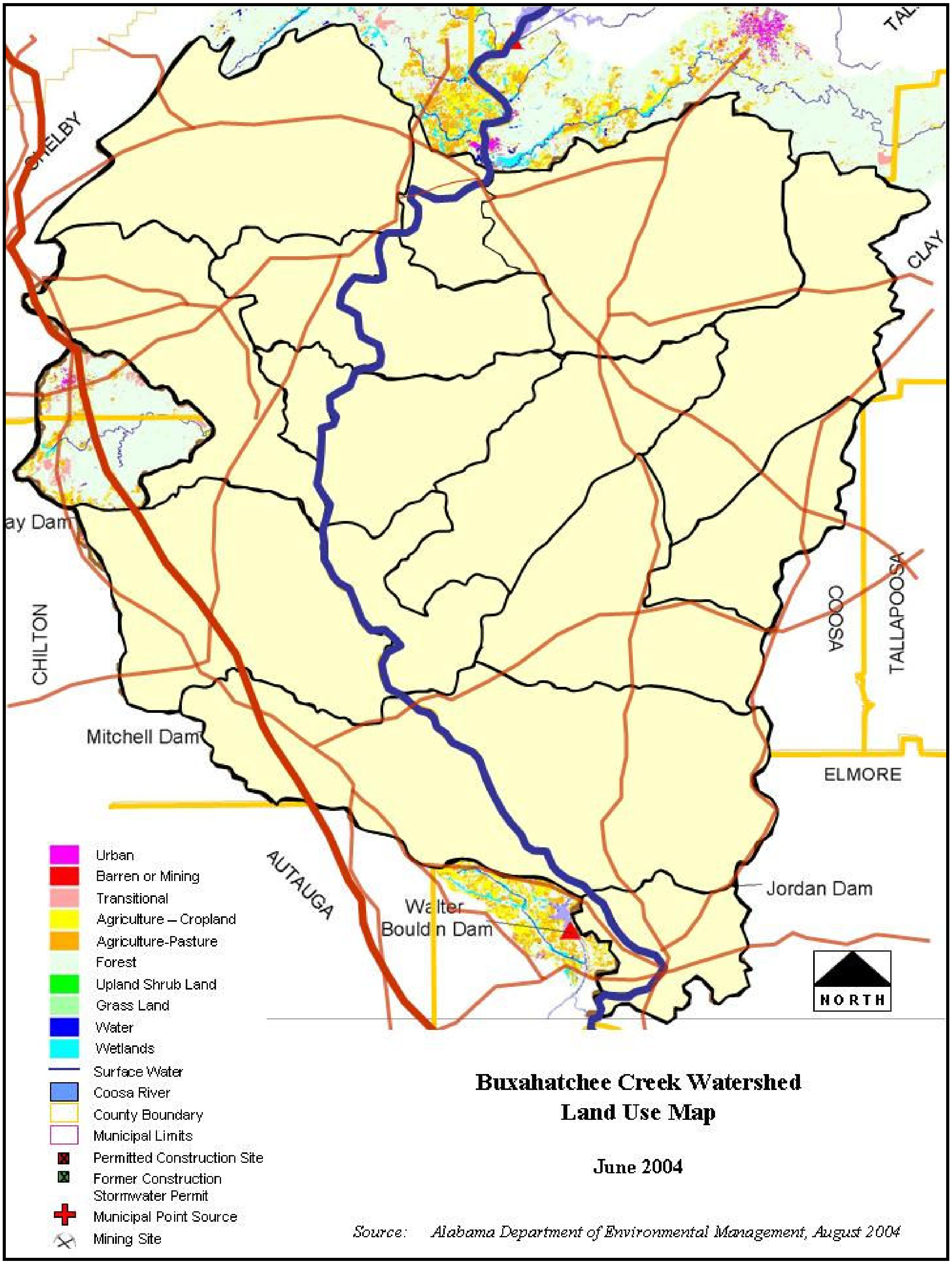
Suitability for Development...................................Poor

2005 Priority Watershed Rating............................. High

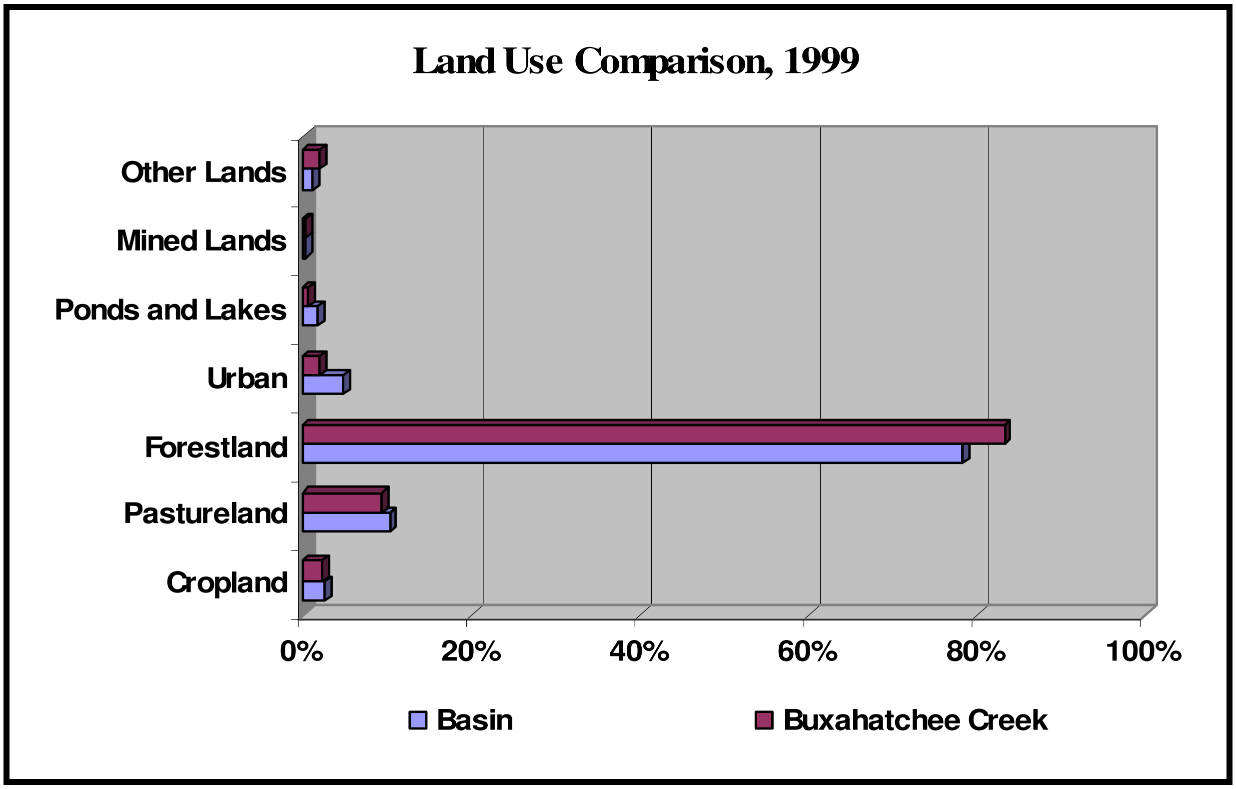
Major Contributing Factors

- Impaired Waterbodies
- Alabama Water Watch Water Quality Monitoring and Results
- Potential for Silviculture
- Increase in Traffic Volume
- Housing Density
- Septic System Density
- High 2000 Unemployment Rate

Land Use – 090



SHELBY
CLAY
COOSA
TALLAPOOSA
CHILTON
ELMORE
AUTAUGA
Mitchell Dam
Jordan Dam
Walter Bouldin Dam
NORTH
Urban
Barren or Mining
Transitional
Agriculture – Cropland
Agriculture-Pasture
Forest
Upland Shrub Land
Grass Land
Water
Wetlands
Surface Water
Coosa River
County Boundary
Municipal Limits
Permitted Construction Site
Former Construction Stormwater Permit
Municipal Point Source
Mining Site
Buxahatchee Creek Watershed
Land Use Map
June 2004
Source: Alabama Department of Environmental Management, August 2004



Land Use Patterns

The only land use category in which the Buxahatchee Creek watershed has a higher percentage than the basin, overall, is forestland giving the watershed a forestry character. Only 2 percent of the land in the watershed is utilized for urban purposes and only 11 percent is utilized for agricultural purposes, of which 2 percent is crop land. Urban land uses are concentrated in the northwest corner of the watershed around the Town of Calera and agricultural land uses are concentrated in the south and southwest portion of the watershed. It is estimated that there are 700 septic systems in the watershed, of which 29.43 percent are failing. It is also estimated that there are 1,150 head of cattle and 12 acres of catfish farms in the watershed. The remaining central and eastern parts of the watershed are primarily in forest land uses which comprise 83 percent of the total land in the watershed. Only 25.60 percent of the total forest land is a deciduous type forest, which is the third lowest in the basin. The remaining 74.4 percent of the forest land is made up of evergreen and mixed forest, indicating a high probability of active silviculture within the watershed. The watershed produces a relatively high amount of sediment, at 8.05 tons per acre. The primary source of sediment is developing urban lands.

The watershed is traversed by three major roads. Interstate 65 and U.S. Highway 31 run north-south in the central part of the watershed, and State Highway 25 provides east-west access across the northern portion of the watershed. All of these roads experienced significant traffic volume increases between 1994 and 2002. Traffic increases on Interstate 65 ranged between 27.76 percent north of the Highway 25 exit to 28.23 percent south of the same exit. Traffic on Highway 31 increased by 9.84 percent south of Highway 25 and by 39.84 north of Highway 25 and south of Interstate 65. Traffic on Highway 25 increased by 27.96 just east of the watershed.

Soils and Species – 090

The Buxahatchee Creek watershed is comprised mostly of soils in two soil associations: the Montevallo-Townley-Enders Association and the Tallapoosa-Tatum Association. In addition, soils from two other soil associations are present in smaller quantities. The north central portion of the watershed is comprised, primarily, of soils in the Decatur-Dewey-Allen Association, while soils in the eastern half of the watershed are in the Tallapoosa-Tatum Association. Soils in the Minvale-Bodine-Fullerton Association are present in the northwestern corner of the watershed and soils in the Savannah-Ruston-Stough Association are present along the southwestern boundary. The soil suitability and limitations for selected uses are provided in the table below. For a map of the soil associations in the watershed and in the Lower Coosa River Basin, refer to the Soil Association Map on page 9.

Association Number	10	16	25	41
Soil Association	Minvale-Bodine-Fullerton	Montevallo-Townley-Enders	Tallapoosa-Tatum	Savannah-Ruston-Stough
Dominant Slope, %	6 - 35	6 - 40	6 - 50	0 - 6
Soil Suitability and Major Limitations For:				
Cropland	Poor: slope, small stones, droughty	Poor: slope, depth to rock	Poor: slope, drought	Good
Pastureland	Fair: slope, droughty	Poor: slope, droughty	Poor: slope	Good
Woodland	Good	Poor: depth to rock	Good	Good
Soil Limitations For:				
Septic Systems	Severe: slope	Severe: depth to rock, slope	Severe: slope, depth to bedrock	Severe: percs slowly
Local Roads / Streets	Severe: slope	Severe: slope	Severe: slope	Moderate: low strength
Small Commercial Bldgs	Severe: slope	Severe: slope	Severe: slope	Moderate: wetness
Dwellings w/o Basements	Severe: slope	Severe: slope	Severe: slope	Moderate: wetness
Camp Areas	Severe: slope	Severe: slope	Severe: slope	Slight
Picnic Areas	Severe: slope	Severe: slope	Severe: slope	Moderate: slope
Playgrounds	Severe: slope	Severe: slope, depth to rock	Severe: slope	Moderate: slope
Paths and Trails	Moderate: slope	Severe: slope	Severe: slope	Slight

The Buxahatchee Creek watershed is located in two Level III Ecoregions. The west part of the watershed is in the Ridge and Valley and the eastern part of the watershed is in the Piedmont. In addition to the protected species found throughout the Lower Coosa River Basin (listed on page 14), the following protected species are found in the Buxahatchee Creek watershed.

Common Name	Scientific Name	Distribution in Lower Coosa River Basin
Coldwater Darter	*Etheostoma ditrema*	(1) Spring-dwelling race-Shelby to Coosa Counties (2) Stream race-Waxahatchee Creek tribs, Shelby County; Coosa River tribs, Coosa County
Dusky Gopher Frog	*Rana capito sevosa*	Shelby County
Bachman's Sparrow	*Aimophila aestivalis*	Coastal Plain and Piedmont province
Bald Eagle	*Haliaeetus leucocephalus*	Coastal Plain and Piedmont province
Appalachian Bewick's wren	*Thryomanes bewickii altus*	North of the Fall Line, particularly in Ridge and Valley province
Meadow Jumping Mouse	*Zapus hudsonius*	Chilton, Coosa and Elmore Counties
Mud Elimia	*Elimia alabamensis*	Shelby, Talladega, Chilton, Coosa Counties
Painted Rocksnail	*Leptoxis tainiata*	Near Wetumpka, Elmore Co; Buxahatchee Creek, Shelby Co.
Upland Hornsnail	*Pleurocera showalteri*	Shelby and Talladega Counties
Hidden Pebblesnail	*Somatogyrus decipiens*	Chilton, Coosa Counties. May be extinct.
Pygmy Pebblesnail	*Somatogyrus pygmaeus*	Chilton County. May be extinct.
Shoals Spiderlily	*Hymenoccallis coronaria*	Shelby County
Running Post Oak	*Quercus boyntonii*	Ridge and Valley Province of Shelby County
AL Canebrake Pitcherplant	*Sarracenia rubra*	Autauga, Chilton, Elmore Counties
Nevius Stonecrop	*Sedum nevii*	Chilton, Coosa, Talladega Counties
Horse-nettle	*Solanum carolinense* var. *hirsutum*	Chilton, Coosa Counties

Demographics – 090

Population - Urban / Rural	Number	Percent
Total Population	4,118	100.00%
Urban	0	0.00%
Rural	4,118	100.00%
Farm	89	2.17%
Nonfarm	4,029	97.83%

Population By Race	Number	Percent
Total Population	4,118	99.92%
White	3,592	87.21%
Black	383	9.29%
American Indian / Alaskan	22	0.53%
Asian	3	0.00%
Native Hawaiian / Pacific Isl.	0	0.00%
Some Other Race	45	1.08%
Two or More Races	75	1.81%

Population By Age	Number	Percent
Total Population	4,118	100.00%
Under 18	1,124	27.28%
18 to 29 Years	601	14.60%
30 to 49 Years	1,269	30.81%
50 to 64 Years	702	17.04%
65 Years and Older	423	10.27%

Population in Households	Number	Percent
Total Population	4,118	100.00%
Population In households	4,106	99.69%
In Family Households	3,714	90.46%
In NonFamily Households	392	9.54%
In Group Quarters	13	0.31%
Institutionalized	8	60.32%
Noninstitutionalized	5	39.68%

Educational Attainment	Number	Percent
Total Population (25 & Over)	2,678	100.00%
No schooling completed	28	1.06%
Some School, No Diploma	701	26.18%
High School Graduate, GED	1,039	38.79%
Some College, No Degree	465	17.37%
Associate degree	98	3.66%
Bachelor's degree	231	8.62%
Master's degree	68	2.53%
Professional school degree	33	1.22%
Doctorate degree	15	0.56%

Place of Birth	Number	Percent
Total	4,118	100.00%
Native	4,042	98.14%
Born in Alabama	3,290	81.40%
Born in Northeast	66	1.62%
Born in Midwest	155	3.83%
Born in South	469	11.59%
Born in West	49	1.20%
Born outside US	14	0.36%
Foreign Born	77	1.86%
Naturalized citizen	23	29.36%
Not a citizen	54	70.64%

Residence in 1995	Number	Percent
Total Population (5 and Over)	3,824	100.00%
Same house in 1995	2,216	57.96%
Different house in 1995	1,607	42.04%
In United States in 1995	1,574	97.93%
Same County	766	48.69%
Different county	808	51.31%
Different county; Same state	593	37.70%
Different state	214	13.62%
Different state; Northeast	21	9.59%
Different state; Midwest	32	14.79%
Different state; South	141	65.63%
Different state; West	21	9.99%
Elsewhere	33	2.07%

Economics and Employment – 090

Median Family Income, 1999	$46,426
Median Household Income, 1999	$38,280
Median Per Capita Income, 1999	$17,807

Employment Status	Number	Percent
Population (16 and over)	3,127	100.00%
In labor force	2,005	64.14%
In Armed Forces	6	0.27%
Civilian	2,000	99.73%
Civilian; Employed	1,907	95.34%
Civilian; Unemployed	93	4.66%
Not in labor force	1,121	35.86%

Place of Work	Number	Percent
Workers (16 and over)	1,866	100.00%
Worked in Alabama	1,853	99.33%
In county of residence	824	44.44%
Outside county of residence	1,030	55.56%
Worked outside Alabama	13	0.67%

Transportation To Work	Number	Percent
Workers (16 and Over)	1,866	100.00%
Car; truck; or van	1,821	97.60%
Drove alone	1,488	81.70%
Carpooled	333	18.30%
Public transportation	0	0.00%
Motorcycle	0	0.00%
Bicycle	0	0.00%
Walked	13	0.69%
Other means	6	0.32%
Worked at home	26	1.40%

Travel Time to Work	Number	Percent
Total Workers (16 and over)	1,866	100.00%
Did Not Work at Home	1,840	98.60%
Less than 5 minutes	66	3.57%
5 to 9 minutes	166	9.01%
10 to 14 minutes	169	9.16%
15 to 19 minutes	185	10.04%
20 to 24 minutes	230	12.49%
25 to 29 minutes	70	3.78%
30 to 34 minutes	271	14.72%
35 to 39 minutes	67	3.65%
40 to 44 minutes	104	5.66%
45 to 59 minutes	317	17.26%
60 to 89 minutes	156	8.45%
90 or more minutes	41	2.22%
Worked at Home	26	1.40%

Employment By Industry	Number	Percent
Employed, 16 and Over	1,907	100.00%
Agri; Forestry; Fish/Hunt	32	1.68%
Mining	19	1.00%
Construction	270	14.16%
Manufacturing	250	13.11%
Wholesale Trade	93	4.88%
Retail Trade	199	10.45%
Transportation/Warehousing	74	3.89%
Utilities	36	1.89%
Information	48	2.49%
Finance and Insurance	139	7.31%
Real Estate	24	1.28%
Prof; Scientific; Tech Svcs	74	3.89%
Mgmt of Companies/Ent	0	0.00%
Admin; Waste Mgmt Svcs	73	3.82%
Educational Services	152	8.00%
Health Care/Social Assist.	184	9.66%
Arts; Entertainment; Rec	24	1.26%
Accommodation/Food Svcs	78	4.06%
Public Administration	43	2.24%
Other Services	94	4.94%

Housing – 090

Median Year Structure Built	1980

Housing	Number	Percent
Total Housing Units	1,683	100.00%
Urban	0	0.00%
Rural	1,683	100.00%

Housing Occupancy	Number	Percent
Total	1,683	100.00%
Occupied	1,545	91.80%
Owner Occupied	1,321	85.47%
Renter Occupied	225	14.53%
Vacant	138	8.20%
For Rent	17	12.17%
For Sale Only	15	11.05%
Rented or Sold;	19	14.05%
For Seasonal Use	28	19.92%
For Migrant Workers	0	0.00%
Other vacant	59	42.81%

Household Size	Number	Percent
Total Occupied Housing Units	1,545	100.00%
1-person household	324	20.95%
2-person household	517	33.45%
3-person household	299	19.34%
4-person household	265	17.13%
5-person household	97	6.24%
6-person household	35	2.27%
7-or-more-person household	9	0.61%

Average Household Size	# Persons
All Housing Units	2.66
Owner occupied	2.73
Renter occupied	2.33

Units & Rooms in Structure	Number	Percent
Housing units: Total	1,683	100.00%
1 Unit - Detached	1,025	60.89%
1 Unit - Attached	4	0.24%
2 units in structure	36	2.16%
3 or 4 units in structure	16	0.98%
5 to 9 units in structure	13	0.74%
10 to 19 units in structure	1	0.06%
20 to 49 units in structure	5	0.31%
50 or more units in structure	0	0.00%
Mobile home	583	34.62%
Boat; RV; van; etc.	0	0.00%
Median number of rooms		5.48

House Heating Fuel	Number	Percent
Total Occupied Housing Units	1,545	100.00%
Utility gas	276	17.84%
Bottled; tank; or LP gas	440	28.49%
Electricity	801	51.86%
Fuel oil; kerosene; etc.	10	0.67%
Coal or coke	0	0.00%
Wood	13	0.86%
Solar energy	0	0.00%
Other fuel	0	0.00%
No fuel used	4	0.28%

Telephone Service	Number	Percent
Total Occupied Housing Units	1,545	100.00%
Telephone Service Available	1,492	96.54%
No Telephone Service Available	54	3.46%

Vehicles Available	Number	Percent
Total Occupied Housing Units	1,545	100.00%
No vehicle available	109	7.04%
1 vehicle available	397	25.69%
2 vehicles available	649	42.02%
3 vehicles available	290	18.75%
4 vehicles available	69	4.46%
5 or more vehicles available	31	2.03%

Plumbing Facilities	Number	Percent
Total Housing Units	1,683	100.00%
Complete plumbing facilities	1,655	98.34%
Lacking complete plumbing facilities	28	1.66%

Kitchen Facilities	Number	Percent
Total Housing Units	1,683	100.00%
Complete kitchen facilities	1,660	98.58%
Lacking complete kitchen facilities	24	1.42%

Rating and Issues – 090

Criteria	Rating
Impaired Water Bodies	5
ADEM Basin Assessment Rating for NPS Potential	1
NRCS Priority Watershed	1
AWW Water Quality Monitoring and Results	5
Use Classification	3
Land Use Character	1
Potential for Silviculture	5
Sediment Loads	4
Animal Density	3
Soil Suitability for Development	4
Growth Rate of County	3
Increase in Traffic Volume	5
Number of Permitted Dischargers	2
Presence of Hydroelectric Dam	1
Housing Density	5
Septic System Density	5
Number of Endangered Species	4
2000 Unemployment Rate	3
Total	**60 High**

With a rating score of 60, the Buxahatchee Creek watershed is considered to be a high priority watershed in the Lower Coosa River Basin. For more information on the watershed rating and ranking system, refer to the *Lower Coosa River Basin Management Plan*, Part IV, Chapter 12: Priority Watersheds.

A total of 23 issues were identified in the Lower Coosa River Basin. Of these, 13 are present in the Spring Creek watershed, of which five are basinwide issues, seven are regional issues, and one is a local concern. The focus of the regional watershed management measures for this watershed is managing growth and development pressures, mitigating stormwater runoff and protection of aquatic habitat.

Refer to the Lower Coosa River Basin Management Plan, Part IV, Chapter 14: Water Quality Improvement Strategy for management measures that may be implemented in this watershed.

Basinwide Issues:
- Endangered Species
- Lack of Water Quality Trend Data
- Illegal Dumping
- Lack of Education and Awareness
- FERC Relicensing of Hydroelectric Facilities

Regional Issues:
- Compliance with the *Recovery Plan for the Mobile River Basin Aquatic Ecosystem*
- Growth Rate and Urban Development
- Sivliculture Runoff
- Urban Runoff
- Sedimentation
- Nutrients, Algae and Invasive Species
- Mining Runoff

Local Concerns:
- Point Source Discharges

Waxahatchee Creek Watershed
HUC: 03150107-100

Watershed Area:	87,372 ac.
Percent of Basin:	6.99%
Type:	Forest
County-Headwaters:	Shelby
County-Mouth:	Chilton
Municipalities:	Columbiana
Total Population:	6,009
Percent of Basin:	5.48%

Land Use	
Lakes and Ponds	580 ac
Cropland	1,000 ac
Pastureland	6,700 ac
Forestland	74,421 ac
Urbanized	2,310 ac
Mined Land	1,080 ac
Other Land	1,281 ac

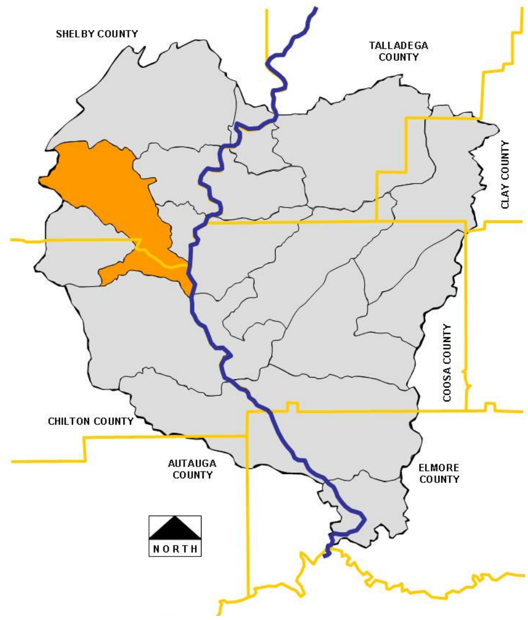
Animal Data	
Cattle	2,310
Dairy	0
Swine	0
Broilers	0
Layers	0
Catfish Acres	9

Domestic Water Data	
Septic Tanks	1,650
Failing Septic Tanks	51
Alternative Systems	30

Sediment Loads (in tons)	
Total	527,515
Cropland	3,000
Sand & Gravel Pits	205,450
Mined Land	90,000
Developing Urban Land	136,800
Gullies	24,150
Critical Areas	8,625
Streambanks	4,500
Dirt Roads and Banks	23,100
Woodland	31,890

Water Users	
Public Water Supply	0
Total Permitted Dischargers	25
Municipal	2
Industrial	22
Mining	1

Waxahatchee Creek Watershed Location Map



Impaired Water Bodies................................. Lay Lake

Active Water Quality Monitoring Sites........................0

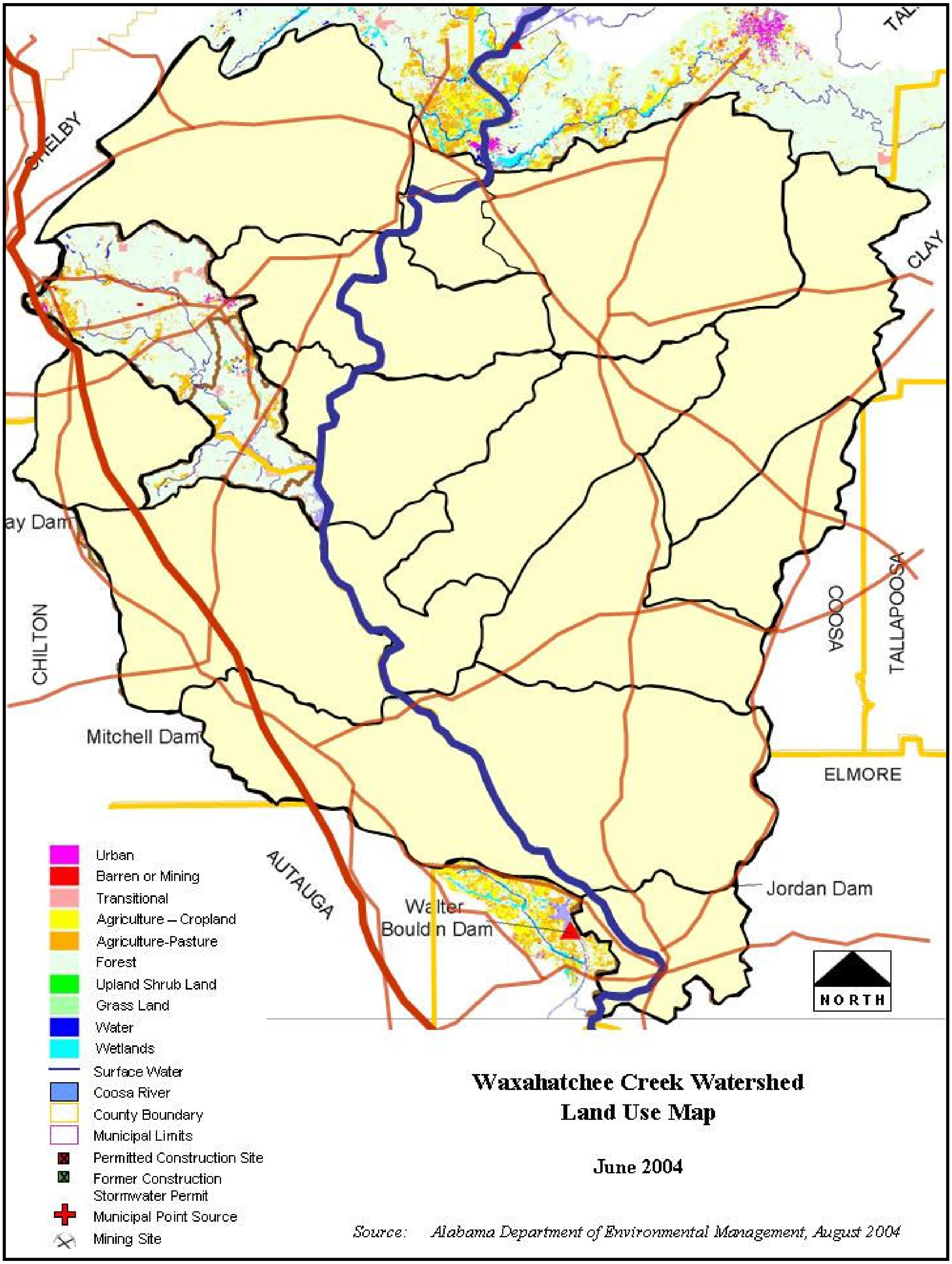
Suitability for Development...................................Poor

2005 Priority Watershed Rating............................ High

<u>Major Contributing Factors</u>

- Impaired Waterbodies
- Alabama Water Watch Water Quality Monitoring and Results
- Soil Suitability for Development
- Growth Rate of County
- Presence of a Hydroelectric Dam
- Number of Endangered Species

Land Use – 100



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Former Construction Stormwater Permit
Municipal Point Source
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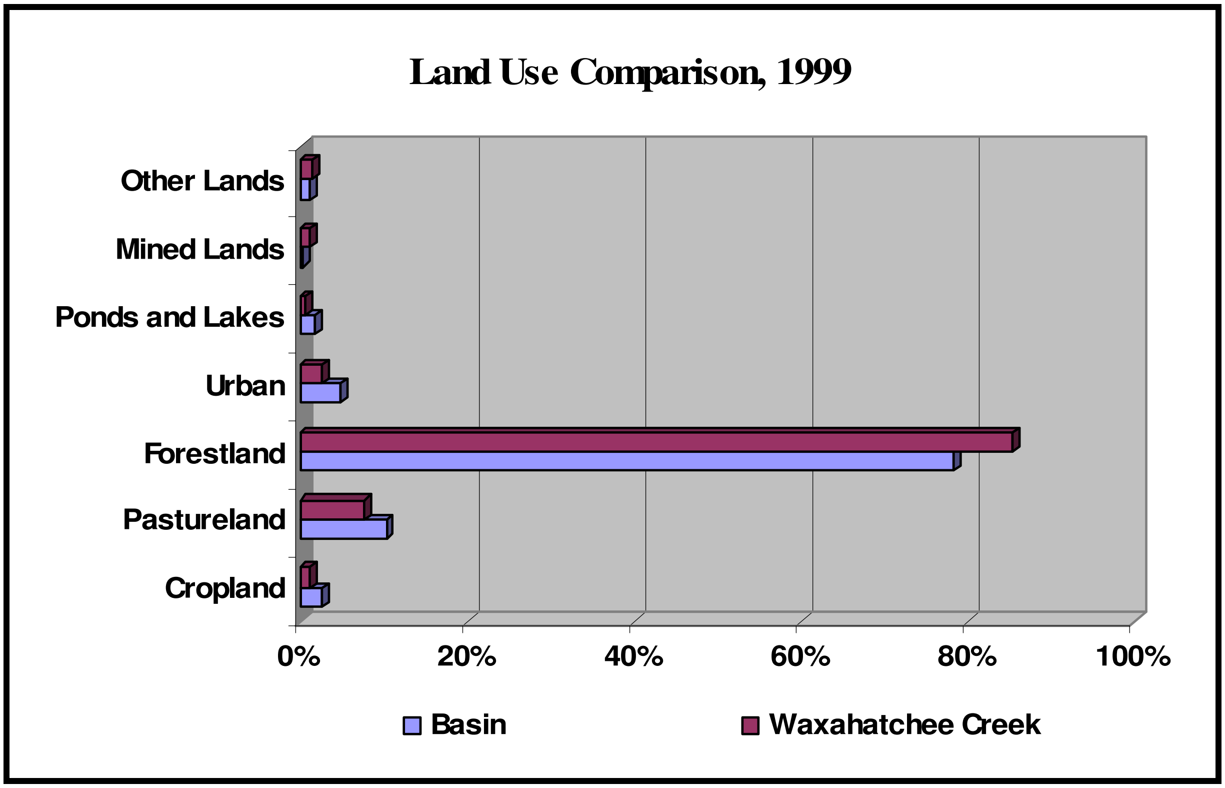
Waxahatchee Creek Watershed
Land Use Map
June 2004
Source: Alabama Department of Environmental Management, August 2004



Land Use Patterns

Overall, the Waxahatchee Creek watershed has a forest character, with 85 percent of the land in forest land uses, as compared with 78 percent of the land in the Lower Coosa River Basin in forest use. Of the total forest land, 30.02 percent is of a deciduous type forest and 69.99 percent is evergreen and mixed forest, indicating a high probability of active silviculture in the watershed. Forest land uses are located in the north central and entire southern parts of the watershed. Only 3 percent of the watershed is utilized for urban land uses and 9 percent is utilized for agricultural purposes. The urban land uses are primarily concentrated along the northeastern boundary as part of Columbiana is located there and along the northeastern boundary where several industrial uses are located. There are 1,650 septic systems in the watershed, of which 3.09 percent are estimated to be failing. Agricultural land uses are located sporadically throughout the watershed with moderate concentrations along the western boundary. It is estimated that there are 2,310 head of cattle and 9 acres of catfish ponds in the watershed. One mining operation is also located in the northwest part of the watershed. The watershed produces a relatively high amount of sediment, at 6.04 tons per acre. The primary sources of sediment are sand and gravel pits, at 2.35 tons per acre, and developing urban lands, at 1.57 tons per acre. There is a substantial road network within the watershed, with Interstate 65 and U.S. Highway 231 running north-south in the northwestern corner; State Highway 25 and 70 running east-west in the northern part; and State Highway 145 running north-south in the southern part o the watershed. All of these roads experienced significant increases in traffic volume between 1994 and 2002, ranging between an 11.42 percent increase on Highway 25 south of the intersection with Highway 70 and a 63.34 percent increase on Highway 70, just east of U.S. Highway 31.

Soils and Species – 100

The Waxahatchee Creek watershed is comprised of soils in three soil associations: the Minvale-Bodine-Fullerton Association, the Montevallo-Townley-Enders Association, and the Tallapoosa-Tatum Association. A small portion of the watershed along the western edge is comprised of soils in the Minvale-Bodine-Fullerton Association. The predominant soil group is the Montevallo-Townley-Enders Association which is found throughout the central part of the watershed. The southeast corner of the watershed is comprised of soils in the Tallapoosa-Tatum Association. The soil suitability and limitations for selected uses are provided in the table below. For a map of the soil associations in the watershed and in the Lower Coosa River Basin, refer to the Soil Association Map on page 9.

Soil Association Number	**10**	**16**	**25**
Soil Association	**Minvale-Bodine-Fullerton**	**Montevallo-Townley-Enders**	**Tallapoosa-Tatum**
Dominant Slope, %	6 - 35	6 - 40	6 - 50
Soil Suitability and Major Limitations For:			
Cropland	Poor: slope, small stones, droughty	Poor: slope, depth to rock	Poor: slope, drought
Pastureland	Fair: slope, droughty	Poor: slope, droughty	Poor: slope
Woodland	Good	Poor: depth to rock	Good
Soil Limitations For:			
Septic Systems	Severe: slope	Severe: depth to rock, slope	Severe: slope, depth to rock
Local Roads and Streets	Severe: slope	Severe: slope	Severe: slope
Small Commercial Buildings	Severe: slope	Severe: slope	Severe: slope
Dwellings without Basements	Severe: slope	Severe: slope	Severe: slope
Camp Areas	Severe: slope	Severe: slope	Severe: slope
Picnic Areas	Severe: slope	Severe: slope	Severe: slope
Playgrounds	Severe: slope	Severe: slope, depth to rock	Severe: slope
Paths and Trails	Moderate: slope	Severe: slope	Severe: slope

The Waxahatchee Creek watershed is located in two Level III Ecoregions. The northwestern part of the watershed is in the Ridge and Valley and the southeastern part is in the Piedmont. The Ridge and Valley is divided into three sub-ecoregions: the Southern Sandstone Ridges, the Southern Limestone/Dolomite Valleys and Low Rolling Hills and the Southern Shale Valleys. In addition to the protected species found throughout the Lower Coosa River Basin (listed on page 14), the following protected species are found in the Waxahatchee Creek watershed.

Common Name	**Scientific Name**	**Distribution in Lower Coosa River Basin**
Coldwater Darter	*Etheostoma ditrema*	(1) Spring-dwelling race-Shelby to Coosa Counties (2) Stream race-Waxahatchee Creek tribs, Shelby Co; Coosa River tribs, Coosa Co
Dusky Gopher Frog	*Rana capito sevosa*	Shelby County
Bachman's Sparrow	*Aimophila aestivalis*	Coastal Plain and Piedmont province
Bald Eagle	*Haliaeetus leucocephalus*	Coastal Plain and Piedmont province
Appalachian Bewick's wren	*Thryomanes bewickii altus*	North of the Fall Line, particularly in Ridge and Valley province
Meadow Jumping Mouse	*Zapus hudsonius*	Chilton, Coosa and Elmore Counties
Mud Elimia	*Elimia alabamensis*	Shelby, Talladega, Chilton, Coosa Counties
Upland Hornsnail	*Pleurocera showalteri*	Shelby and Talladega Counties
Stocky Pebblesnail	*Somatogyrus crassus*	Main stem in Elmore, Chilton, Coosa Counties. May be extinct.
Hidden Pebblesnail	*Somatogyrus decipiens*	Chilton, Coosa Counties. May be extinct.
Fluted Pebblesnail	*Somatogyrus hendersoni*	Main stem, Coosa, Chilton Counties. May be extinct.
Moon Pebblesnail	*Somatogyrus obtusus*	Chilton-Coosa County shoals
Pygmy Pebblesnail	*Somatogyrus pygmaeus*	Chilton County. May be extinct.
Shoals Spiderlily	*Hymenoccallis coronaria*	Shelby County
Running Post Oak	*Quercus boyntonii*	Ridge and Valley Province of Shelby County
AL Canebrake Pitcherplant	*Sarracenia rubra*	Autauga, Chilton, Elmore Counties
Nevius Stonecrop	*Sedum nevii*	Chilton, Coosa, Talladega Counties
Horse-nettle	*Solanum carolinense* var. *hirsutum*	Chilton, Coosa Counties

Demographics – 100

Population - Urban / Rural	Number	Percent
Total Population	6,009	100.00%
Urban	0	0.00%
Rural	6,009	100.00%
Farm	83	1.37%
Nonfarm	5,927	98.63%

Population By Race	Number	Percent
Total Population	6,009	100.00%
White	4,994	83.11%
Black	855	14.23%
American Indian / Alaskan	45	0.75%
Asian	0	0.00%
Native Hawaiian / Pacific Isl.	0	0.00%
Some Other Race	29	0.48%
Two or More Races	86	1.43%

Population By Age	Number	Percent
Total Population	6,009	100.00%
Under 18	1,629	27.11%
18 to 29 Years	979	16.29%
30 to 49 Years	1,835	30.53%
50 to 64 Years	971	16.16%
65 Years and Older	595	9.91%

Population in Households	Number	Percent
Total Population	6,009	100.00%
Population In households	5,951	99.04%
In Family Households	5,218	87.68%
In NonFamily Households	733	12.32%
In Group Quarters	58	0.96%
Institutionalized	58	100.00%
Noninstitutionalized	0	0.00%

Educational Attainment	Number	Percent
Total Population (25 & Over)	3,862	100.00%
No schooling completed	50	1.31%
Some School, No Diploma	1,170	30.30%
High School Graduate, GED	1,319	34.14%
Some College, No Degree	694	17.96%
Associate degree	177	4.58%
Bachelor's degree	296	7.66%
Master's degree	90	2.32%
Professional school degree	50	1.29%
Doctorate degree	17	0.45%

Place of Birth	Number	Percent
Total	6,009	100.00%
Native	5,985	99.60%
Born in Alabama	4,811	80.39%
Born in Northeast	106	1.77%
Born in Midwest	252	4.20%
Born in South	733	12.25%
Born in West	53	0.88%
Born outside US	30	0.50%
Foreign Born	24	0.40%
Naturalized citizen	7	30.35%
Not a citizen	17	69.65%

Residence in 1995	Number	Percent
Total Population (5 and Over)	5,588	100.00%
Same house in 1995	3,276	58.62%
Different house in 1995	2,312	41.38%
In United States in 1995	2,274	98.34%
Same County	1,447	63.64%
Different county	827	36.36%
Different county; Same state	522	22.95%
Different state	305	13.42%
Different state; Northeast	39	12.92%
Different state; Midwest	48	15.88%
Different state; South	200	65.69%
Different state; West	17	5.51%
Elsewhere	38	1.66%

Economics and Employment – 100

Median Family Income, 1999	$46,439
Median Household Income, 1999	$38,739
Median Per Capita Income, 1999	$18,035

Employment Status	Number	Percent
Population (16 and over)	4,559	100.00%
In labor force	2,921	64.07%
In Armed Forces	4	0.14%
Civilian	2,917	99.86%
Civilian; Employed	2,761	94.67%
Civilian; Unemployed	156	5.33%
Not in labor force	1,638	35.93%

Place of Work	Number	Percent
Workers (16 and over)	2,698	100.00%
Worked in Alabama	2,676	99.21%
In county of residence	1,776	66.38%
Outside county of residence	900	33.62%
Worked outside Alabama	21	0.79%

Transportation To Work	Number	Percent
Workers (16 and Over)	2,698	100.00%
Car; truck; or van	2,610	96.76%
Drove alone	2,267	86.85%
Carpooled	343	13.15%
Public transportation	0	0.00%
Motorcycle	0	0.00%
Bicycle	0	0.00%
Walked	19	0.70%
Other means	12	0.43%
Worked at home	57	2.11%

Travel Time to Work	Number	Percent
Total Workers (16 and over)	2,698	100.00%
Did Not Work at Home	2,641	97.89%
Less than 5 minutes	86	3.26%
5 to 9 minutes	258	9.77%
10 to 14 minutes	225	8.50%
15 to 19 minutes	279	10.55%
20 to 24 minutes	322	12.19%
25 to 29 minutes	104	3.94%
30 to 34 minutes	508	19.25%
35 to 39 minutes	88	3.33%
40 to 44 minutes	132	4.99%
45 to 59 minutes	323	12.24%
60 to 89 minutes	232	8.77%
90 or more minutes	85	3.22%
Worked at Home	57	2.11%

Employment By Industry	Number	Percent
Employed, 16 and Over	2,761	100.00%
Agri; Forestry; Fish/Hunt	39	1.41%
Mining	26	0.96%
Construction	410	14.86%
Manufacturing	422	15.29%
Wholesale Trade	107	3.88%
Retail Trade	297	10.74%
Transportation/Warehousing	131	4.75%
Utilities	38	1.38%
Information	67	2.43%
Finance and Insurance	155	5.60%
Real Estate	50	1.79%
Prof; Scientific; Tech Svcs	98	3.53%
Mgmt of Companies/Ent	8	0.29%
Admin; Waste Mgmt Svcs	101	3.66%
Educational Services	185	6.68%
Health Care/Social Assist.	188	6.80%
Arts; Entertainment; Rec	52	1.90%
Accommodation/Food Svcs	129	4.66%
Public Administration	140	5.07%
Other Services	119	4.31%

Median Year Structure Built	1980

Housing	Number	Percent
Total Housing Units	2,758	100.00%
Urban	0	0.00%
Rural	2,758	100.00%

Housing Occupancy	Number	Percent
Total	2,758	100.00%
Occupied	2,323	84.21%
Owner Occupied	1,797	77.37%
Renter Occupied	526	22.63%
Vacant	435	15.79%
For Rent	62	14.27%
For Sale Only	18	4.08%
Rented or Sold;	25	5.63%
For Seasonal Use	220	50.48%
For Migrant Workers	0	0.00%
Other vacant	111	25.54%

Household Size	Number	Percent
Total Occupied Housing Units	2,323	100.00%
1-person household	592	25.50%
2-person household	684	29.45%
3-person household	447	19.26%
4-person household	382	16.47%
5-person household	156	6.71%
6-person household	44	1.90%
7-or-more-person household	17	0.71%

Average Household Size	# Persons
All Housing Units	2.56
Owner occupied	2.62
Renter occupied	2.35

Units & Rooms in Structure	Number	Percent
Housing units: Total	2,758	100.00%
1 Unit - Detached	1,412	51.20%
1 Unit - Attached	9	0.34%
2 units in structure	17	0.60%
3 or 4 units in structure	63	2.28%
5 to 9 units in structure	48	1.74%
10 to 19 units in structure	84	3.06%
20 to 49 units in structure	30	1.09%
50 or more units in structure	8	0.30%
Mobile home	1,071	38.82%
Boat; RV; van; etc.	16	0.57%
Median number of rooms		5.34

House Heating Fuel	Number	Percent
Total Occupied Housing Units	2,323	100.00%
Utility gas	342	14.74%
Bottled; tank; or LP gas	639	27.52%
Electricity	1,295	55.75%
Fuel oil; kerosene; etc.	14	0.58%
Coal or coke	1	0.04%
Wood	22	0.95%
Solar energy	0	0.00%
Other fuel	5	0.20%
No fuel used	5	0.21%

Telephone Service	Number	Percent
Total Occupied Housing Units	2,323	100.00%
Telephone Service Available	2,222	95.68%
No Telephone Service Available	100	4.32%

Vehicles Available	Number	Percent
Total Occupied Housing Units	2,323	100.00%
No vehicle available	171	7.38%
1 vehicle available	667	28.73%
2 vehicles available	943	40.61%
3 vehicles available	364	15.67%
4 vehicles available	107	4.59%
5 or more vehicles available	70	3.02%

Plumbing Facilities	Number	Percent
Total Housing Units	2,758	100.00%
Complete plumbing facilities	2,720	98.61%
Lacking complete plumbing facilities	38	1.39%

Kitchen Facilities	Number	Percent
Total Housing Units	2,758	100.00%
Complete kitchen facilities	2,723	98.73%
Lacking complete kitchen facilities	35	1.27%

Rating and Issues – 100

Criteria	Rating
Impaired Water Bodies	5
ADEM Basin Assessment Rating for NPS Potential	1
NRCS Priority Watershed	1
AWW Water Quality Monitoring and Results	5
Use Classification	3
Land Use Character	1
Potential for Silviculture	
Sediment Loads	4
Animal Density	3
Soil Suitability for Development	5
Growth Rate of County	5
Increase in Traffic Volume	4
Number of Permitted Dischargers	4
Presence of Hydroelectric Dam	5
Housing Density	4
Septic System Density	5
Number of Endangered Species	5
2000 Unemployment Rate	3
Total	**67 High**

With a rating score of 67, the Waxahatchee Creek watershed is considered to be a high priority watershed in the Lower Coosa River Basin. For more information on the watershed rating and ranking system, refer to the *Lower Coosa River Basin Management Plan*, Part IV, Chapter 12: Priority Watersheds.

A total of 23 issues were identified in the Lower Coosa River Basin. Of these, 13 are present in the Spring Creek watershed, of which five are basinwide issues and eight are regional issues. The focus of the regional watershed management measures for this watershed is managing growth and development pressures, mitigating stormwater runoff and water quality improvement.

Refer to the Lower Coosa River Basin Management Plan, Part IV, Chapter 14: Water Quality Improvement Strategy for management measures that may be implemented in this watershed.

Basinwide Issues:
- Endangered Species
- Lack of Water Quality Trend Data
- Illegal Dumping
- Lack of Education and Awareness
- FERC Relicensing of Hydroelectric Facilities

Regional Issues:
- Growth Rate and Urban Development
- Sivliculture Runoff
- Urban Runoff
- Sedimentation
- Nutrients, Algae and Invasive Species
- Low Dissolved Oxygen
- Temperature and Thermal Stress
- Mining Runoff

Upper Hatchet Creek Watershed
HUC: 03150107-110

Watershed Area:	96,450 ac.
Percent of Basin:	7.71%
Type:	Forest
County-Headwaters:	Clay
County-Mouth:	Coosa
Municipalities:	Goodwater
Total Population:	3021
Percent of Basin:	2.75%

Land Use

Lakes and Ponds	265 ac
Cropland	75 ac
Pastureland	6,803 ac
Forestland	88,000 ac
Urbanized	194 ac
Mined Land	10 ac
Other Land	1,103 ac

Animal Data

Cattle	885
Dairy	0
Swine	0
Broilers	0
Layers	0
Catfish Acres	78

Domestic Water Data

Septic Tanks	450
Failing Septic Tanks	32
Alternative Systems	0

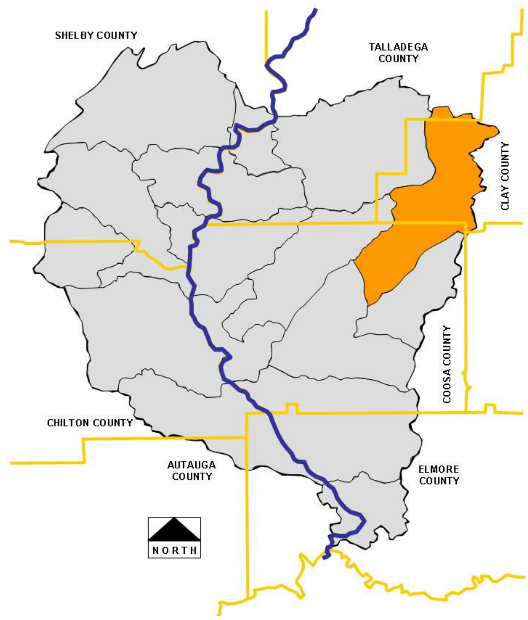
Sediment Loads (in tons)

Total	164,993
Cropland	68
Sand & Gravel Pits	0
Mined Land	18
Developing Urban Land	2,000
Gullies	2,520
Critical Areas	23,600
Streambanks	42,300
Dirt Roads and Banks	45,360
Woodland	49,127

Water Users

Public Water Supply	0
Total Permitted Dischargers	1
Municipal	1
Industrial	0
Mining	0

Upper Hatchet Creek Watershed Location Map



Impaired Water Bodies..None

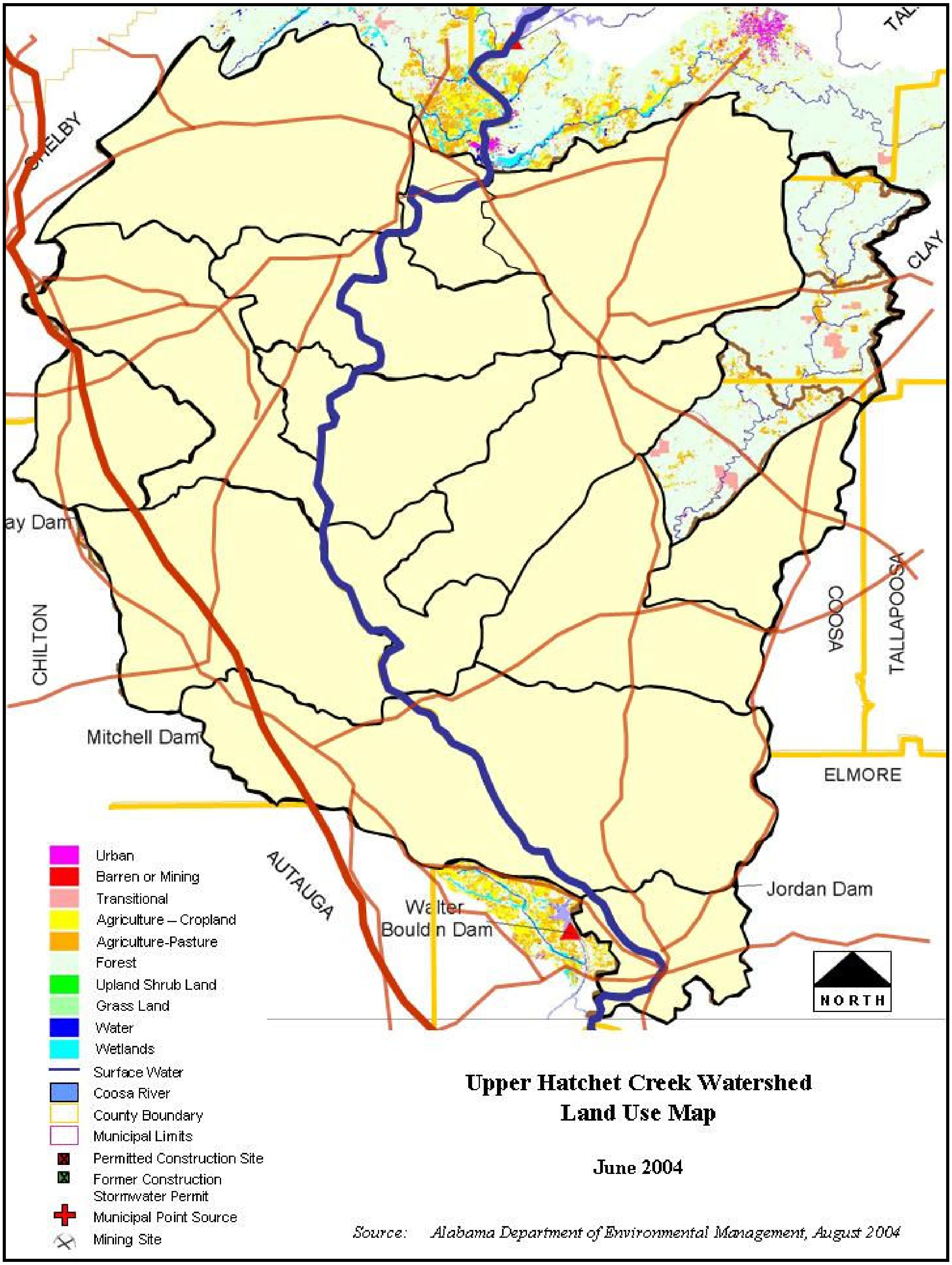
Active Water Quality Monitoring Sites........................0

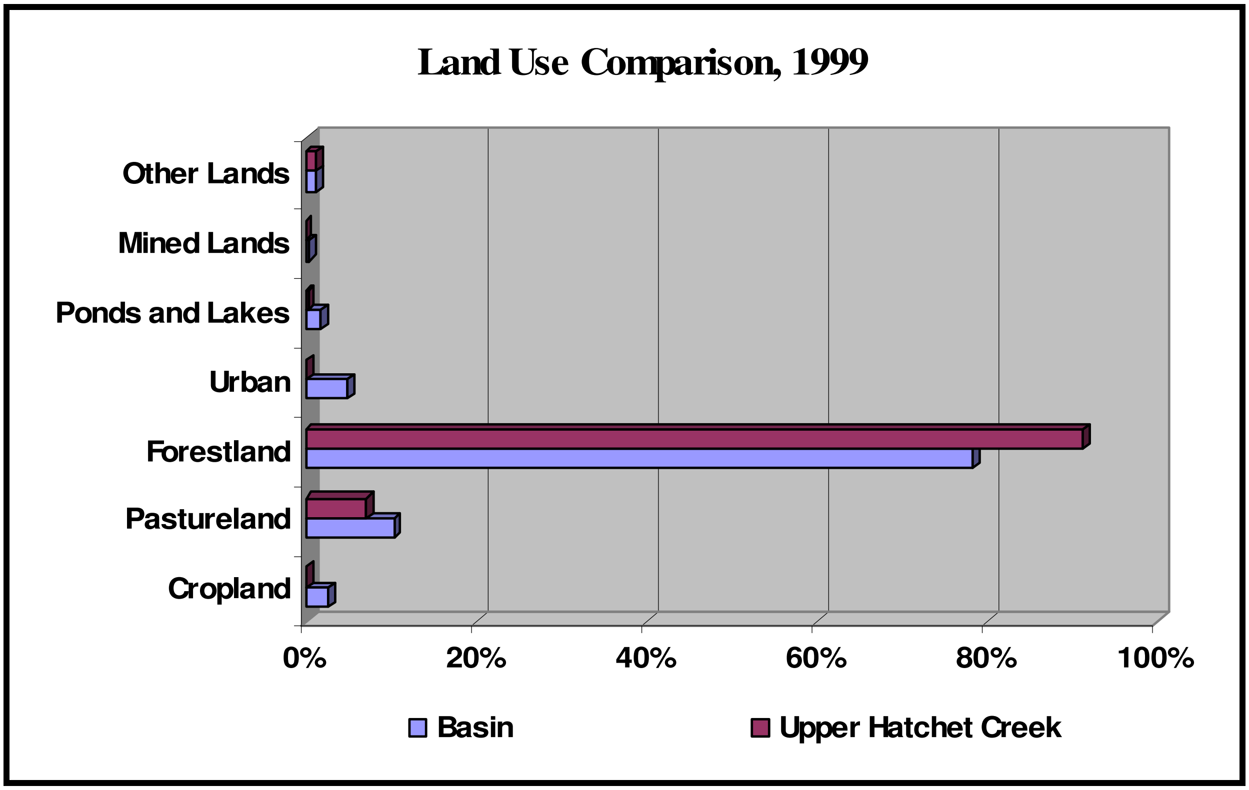
Suitability for Development...................................Poor

2005 Priority Watershed Rating..............................Low

Major Contributing Factors

- Alabama Water Watch Water Quality Monitoring and Results
- Use Classification
- Septic System Density
- High 2000 Unemployment Rate
- Soil Suitability for Development
- Number of Endangered Species


TAL
SHELBY
CLAY
ay Dam
CHILTON
COOSA
TALLAPOOSA
Mitchell Dam
ELMORE
AUTAUGA
Walter Bouldin Dam
Jordan Dam
NORTH
Urban
Barren or Mining
Transitional
Agriculture – Cropland
Agriculture-Pasture
Forest
Upland Shrub Land
Grass Land
Water
Wetlands
Surface Water
Coosa River
County Boundary
Municipal Limits
Permitted Construction Site
Former Construction Stormwater Permit
Municipal Point Source
Mining Site
Upper Hatchet Creek Watershed
Land Use Map
June 2004
Source: Alabama Department of Environmental Management, August 2004



Land Use Patterns

The Upper Hatchet Creek watershed has an overwhelming forest character, with 91 percent of the land in forested land uses. This watershed has the highest percentage of deciduous forest in the entire basin area, at 57.39 percent of the forest land use, which equates to 50,507 acres. This high percentage can be attributed, in large part, to the presence of the Talladega National Forest in the northern part of the watershed. The remaining 42.61 percent of the forest land is in evergreen or mixed forest land uses. The only other measurable land use in the watershed is pasture land, which accounts for 7 percent of the total land in the watershed. Pasture land uses are found sporadically through the central portion of the watershed. It is estimated that there are 885 head of cattle and 78 acres of catfish ponds in the watershed. Urban land is virtually nonexistent in the watershed, with only 194 acres of a total of 96,450 acres in urban land uses. It is estimated that there are 450 septic systems in the watershed, of which 7.1 percent are failing. Sediment production in the watershed is estimated at 1.67 tons per acre, which is fairly low in comparison to the other 19 watersheds in the basin. The majority of the sediment comes from woodlands, at 0.5 tons per acre; dirt roads and road banks, at 0.46 tons per acre; and stream banks, at 0.43 tons per acre. There are four major roads providing access to the watershed. U.S. Highway runs north-south at the southwest boundary of the watershed and U.S. Highway 280 runs east-west through the southern half. Alabama Highway 148 runs east-west through the northern part of the watershed and Alabama Highway 9 runs north-south along the eastern boundary. Traffic volume increased significantly in the watershed between 1994 and 2002. The greatest increases were seen at the intersection of Alabama Highways 9 and 63, at 32.87 percent increase, in the east; on Highway 148, at 24.68 percent increase in the north; and on U.S. Highway 280 near Mt. Olive, at 22.10 percent increase, in the southern part of the watershed.

Soils and Species – 110

The Upper Hatchet Creek watershed is comprised of soils in five soil associations: the Cheaha-Leesburg, the Cecil-Grover-Madison, the Iredell-Mecklenburg, the Madison-Tallapoosa, and the Tallapoosa-Tatum. The Cheaha-Leesburg, Iredell-Mecklenburg and the Madison-Tallapoosa Associations are found in small quantities in the northern part of the watershed. The central part is made up of soils in the Tallapoosa-Tatum Association and the Cecil-Grover-Madison is found to a lesser degree in the southern part of the watershed. The soil suitability and limitations for selected uses are provided in the table below. For a map of the soil associations in the watershed and in the Lower Coosa River Basin, refer to the Soil Association Map on page 9.

Association Number	2	18	20	23	25
Soil Association	**Cheaha-Leesburg**	**Cecil-Grover-Madison**	**Iredell- Mecklenburg**	**Madison-Tallapoosa**	**Tallapoosa-Tatum**
Dominant Slope, %	20 - 50	2 - 25	2 - 10	2 - 25	6 – 50
Soil Suitability and Major Limitations For:					
Cropland	Poor: slope, large stones	Poor: slope	Fair: too clayey	Poor: slope	Poor: slope, droughty
Pastureland	Poor: slope	Good	Good	Fair-Slope	Poor: slope
Woodland	Good	Good	Fair: too clayey	Good	Good
Soil Limitations For:					
Septic Systems	Severe: slope, depth to rock	Moderate: percs slowly	Severe: percs slowly	Moderate: slope, percs slowly	Severe: slope, depth to bedrock
Local Roads and Streets	Severe: slope	Moderate: low strength	Severe: low strength, shrink-swell	Severe: slope, low strength	Severe: slope
Small Commercial Buildings	Severe: slope	Severe: slope	Severe: shrink-swell	Severe: slope, low strength	Severe: slope
Dwellings without Basements	Severe: slope	Moderate: slope	Severe: shrink-swell	Severe: low strength	Severe: slope
Camp Areas	Severe: slope, large stones	Moderate: slope	Moderate: percs slowly, too clayey	Moderate: slope	Severe: slope
Picnic Areas	Severe: slope	Moderate: slope	Moderate: too clayey	Moderate: slope	Severe: slope
Playgrounds	Severe: slope, large stones	Severe: slope	Moderate: percs slowly, too clayey	Severe: slope	Severe: slope
Paths and Trails	Severe: slope, large stones	Slight	Moderate: too clayey, slope	Moderate: slope	Severe: slope

The Upper Hatchet Creek watershed is located in the Piedmont Level III Ecoregion. It is further subdivided into two Level IV sub-ecoregions: the Talladega Upland and the Southern Inner Piedmont. In addition to the protected species found throughout the Lower Coosa River Basin (listed on page 14), the following protected species are found in the Upper Hatchet Creek watershed.

Common Name	Scientific Name	Distribution in Lower Coosa River Basin
Coldwater Darter	*Etheostoma ditrema*	(1) Spring-dwelling race-Shelby to Coosa Co (2) Stream race-Waxahatchee Creek tribs, Shelby Co; Coosa River tribs, Coosa Co
Coal Darter	*Percina brevicauda*	Coosa River and Hatchet Creek
Bachman's Sparrow	*Aimophila aestivalis*	Coastal Plain and Piedmont province
Bald Eagle	*Haliaeetus leucocephalus*	Coastal Plain and Piedmont province
Meadow Jumping Mouse	*Zapus hudsonius*	Chilton, Coosa and Elmore Counties
Mud Elimia	*Elimia alabamensis*	Shelby, Talladega, Chilton, Coosa Counties
Hidden Pebblesnail	*Somatogyrus decipiens*	Chilton, Coosa Counties. May be extinct.
Tulotoma Snail	*Tulotoma magnifica*	Near Wetumpka, Elmore County; Weogufka Creek, Hatchet Creek, Coosa County.
Nevius Stonecrop	*Sedum nevii*	Chilton, Coosa, Talladega Counties
Horse-nettle	*Solanum carolinense* var. *hirsutum*	Chilton, Coosa Counties
Roundleaf Meadowrue	*Thalictrum subrotundum*	Autauga, Clay Counties

Population - Urban / Rural	Number	Percent
Total Population	3,021	100.00%
Urban	4	0.12%
Rural	3,018	99.88%
Farm	122	4.04%
Nonfarm	2,896	95.96%

Population By Race	Number	Percent
Total Population	3,021	100.00%
White	1,652	54.68%
Black	1,320	43.70%
American Indian / Alaskan	10	0.35%
Asian	0	0.00%
Native Hawaiian / Pacific Isl.	0	0.00%
Some Other Race	23	0.76%
Two or More Races	15	0.51%

Population By Age	Number	Percent
Total Population	3,021	100.00%
Under 18	748	24.76%
18 to 29 Years	409	13.52%
30 to 49 Years	904	29.92%
50 to 64 Years	513	16.99%
65 Years and Older	447	14.81%

Population in Households	Number	Percent
Total Population	3,021	100.00%
Population In households	3,011	99.67%
In Family Households	2,698	89.58%
In NonFamily Households	314	10.42%
In Group Quarters	10	0.33%
Institutionalized	10	100.00%
Noninstitutionalized	0	0.00%

Educational Attainment	Number	Percent
Total Population (25 & Over)	2,026	100.00%
No schooling completed	50	2.45%
Some School, No Diploma	672	33.15%
High School Graduate, GED	794	39.19%
Some College, No Degree	348	17.16%
Associate degree	70	3.44%
Bachelor's degree	45	2.21%
Master's degree	31	1.52%
Professional school degree	14	0.68%
Doctorate degree	4	0.21%

Place of Birth	Number	Percent
Total	3,021	100.00%
Native	3,009	99.60%
Born in Alabama	2,758	91.67%
Born in Northeast	28	0.93%
Born in Midwest	35	1.17%
Born in South	130	4.30%
Born in West	38	1.27%
Born outside US	20	0.65%
Foreign Born	12	0.40%
Naturalized citizen	0	0.00%
Not a citizen	12	100.00%

Residence in 1995	Number	Percent
Total Population (5 and Over)	2,874	100.00%
Same house in 1995	2,140	74.46%
Different house in 1995	734	25.54%
In United States in 1995	719	98.04%
Same County	356	49.48%
Different county	364	50.52%
Different county; Same state	302	42.00%
Different state	61	8.53%
Different state; Northeast	1	1.63%
Different state; Midwest	11	17.52%
Different state; South	45	72.86%
Different state; West	5	7.99%
Elsewhere	14	1.96%

Median Family Income, 1999	$33,211
Median Household Income, 1999	$27,567
Median Per Capita Income, 1999	$11,224

Employment Status	Number	Percent
Population (16 and over)	2,374	100.00%
In labor force	1,316	55.44%
In Armed Forces	0	0.00%
Civilian	1,316	100.00%
Civilian; Employed	1,206	91.64%
Civilian; Unemployed	110	8.36%
Not in labor force	1,058	44.56%

Place of Work	Number	Percent
Workers (16 and over)	1,170	100.00%
Worked in Alabama	1,151	98.33%
In county of residence	312	27.15%
Outside county of residence	838	72.85%
Worked outside Alabama	20	1.67%

Transportation To Work	Number	Percent
Workers (16 and Over)	1,170	100.00%
Car; truck; or van	1,145	97.83%
Drove alone	962	84.06%
Carpooled	183	15.94%
Public transportation	3	0.26%
Motorcycle	0	0.00%
Bicycle	0	0.00%
Walked	6	0.51%
Other means	7	0.57%
Worked at home	10	0.83%

Travel Time to Work	Number	Percent
Total Workers (16 and over)	1,170	100.00%
Did Not Work at Home	1,161	99.17%
Less than 5 minutes	24	2.06%
5 to 9 minutes	78	6.75%
10 to 14 minutes	97	8.36%
15 to 19 minutes	201	17.33%
20 to 24 minutes	256	22.05%
25 to 29 minutes	87	7.46%
30 to 34 minutes	220	18.98%
35 to 39 minutes	16	1.35%
40 to 44 minutes	29	2.51%
45 to 59 minutes	48	4.12%
60 to 89 minutes	60	5.13%
90 or more minutes	45	3.89%
Worked at Home	10	0.83%

Employment By Industry	Number	Percent
Employed, 16 and Over	1,206	100.00%
Agri; Forestry; Fish/Hunt	20	1.67%
Mining	9	0.73%
Construction	87	7.24%
Manufacturing	521	43.17%
Wholesale Trade	20	1.63%
Retail Trade	84	6.95%
Transportation/Warehousing	28	2.35%
Utilities	26	2.12%
Information	2	0.17%
Finance and Insurance	17	1.37%
Real Estate	1	0.08%
Prof; Scientific; Tech Svcs	8	0.70%
Mgmt of Companies/Ent	3	0.23%
Admin; Waste Mgmt Svcs	16	1.32%
Educational Services	81	6.68%
Health Care/Social Assist.	109	9.06%
Arts; Entertainment; Rec	4	0.35%
Accommodation/Food Svcs	73	6.05%
Public Administration	44	3.63%
Other Services	54	4.50%

Median Year Structure Built	1972

Housing	Number	Percent
Total Housing Units	1,340	100.00%
Urban	2	0.11%
Rural	1,338	99.89%

Housing Occupancy	Number	Percent
Total	1,340	100.00%
Occupied	1,162	86.76%
Owner Occupied	1,009	86.85%
Renter Occupied	153	13.15%
Vacant	177	13.24%
For Rent	20	11.36%
For Sale Only	18	9.92%
Rented or Sold;	5	2.82%
For Seasonal Use	40	22.78%
For Migrant Workers	2	0.99%
Other vacant	92	52.13%

Household Size	Number	Percent
Total Occupied Housing Units	1,162	100.00%
1-person household	283	24.36%
2-person household	355	30.53%
3-person household	269	23.17%
4-person household	141	12.11%
5-person household	72	6.20%
6-person household	23	2.01%
7-or-more-person household	19	1.63%

Average Household Size	# Persons
All Housing Units	2.61
Owner occupied	2.64
Renter occupied	2.33

Units & Rooms in Structure	Number	Percent
Housing units: Total	1,340	100.00%
1 Unit - Detached	941	70.22%
1 Unit - Attached	3	0.23%
2 units in structure	12	0.87%
3 or 4 units in structure	25	1.83%
5 to 9 units in structure	1	0.07%
10 to 19 units in structure	0	0.00%
20 to 49 units in structure	1	0.06%
50 or more units in structure	0	0.00%
Mobile home	356	26.59%
Boat; RV; van; etc.	2	0.13%
Median number of rooms		5.52

House Heating Fuel	Number	Percent
Total Occupied Housing Units	1,162	100.00%
Utility gas	249	21.41%
Bottled; tank; or LP gas	431	37.11%
Electricity	396	34.04%
Fuel oil; kerosene; etc.	2	0.13%
Coal or coke	0	0.00%
Wood	84	7.24%
Solar energy	0	0.00%
Other fuel	0	0.00%
No fuel used	1	0.08%

Telephone Service	Number	Percent
Total Occupied Housing Units	1,162	100.00%
Telephone Service Available	1,074	92.39%
No Telephone Service Available	88	7.61%

Vehicles Available	Number	Percent
Total Occupied Housing Units	1,162	100.00%
No vehicle available	116	9.95%
1 vehicle available	308	26.51%
2 vehicles available	442	38.05%
3 vehicles available	218	18.78%
4 vehicles available	55	4.77%
5 or more vehicles available	23	1.95%

Plumbing Facilities	Number	Percent
Total Housing Units	1,340	100.00%
Complete plumbing facilities	1,305	97.44%
Lacking complete plumbing facilities	34	2.56%

Kitchen Facilities	Number	Percent
Total Housing Units	1,340	100.00%
Complete kitchen facilities	1,290	96.33%
Lacking complete kitchen facilities	49	3.67%

Rating and Issues – 110

Criteria	Rating
Impaired Water Bodies	1
ADEM Basin Assessment Rating for NPS Potential	1
NRCS Priority Watershed	1
AWW Water Quality Monitoring and Results	5
Use Classification	5
Land Use Character	1
Potential for Silviculture	2
Sediment Loads	1
Animal Density	1
Soil Suitability for Development	4
Growth Rate of County	1
Increase in Traffic Volume	3
Number of Permitted Dischargers	2
Presence of Hydroelectric Dam	1
Housing Density	3
Septic System Density	5
Number of Endangered Species	4
2000 Unemployment Rate	5
Total	**46 Low**

With a rating score of 46, the Upper Hatchet Creek watershed is considered to be a low priority watershed in the Lower Coosa River Basin. For more information on the watershed rating and ranking system, refer to the *Lower Coosa River Basin Management Plan*, Part IV, Chapter 12: Priority Watersheds.

A total of 23 issues were identified in the Lower Coosa River Basin. Of these, 8 are present in the Upper Hatchet Creek watershed, of which five are basinwide issues and three are regional issues. The focus of the regional watershed management measures for this watershed is mitigation of silviculture and woodland runoff and protection of aquatic habitat.

Refer to the Lower Coosa River Basin Management Plan, Part IV, Chapter 14: Water Quality Improvement Strategy for management measures that may be implemented in this watershed.

Basinwide Issues:
- Endangered Species
- Lack of Water Quality Trend Data
- Illegal Dumping
- Lack of Education and Awareness
- FERC Relicensing of Hydroelectric Facilities

Regional Issues:
- Compliance with the *Recovery Plan for the Mobile River Basin Aquatic Ecosystem*
- Designation as a Critical Habitat
- Sivliculture Runoff

Socapatoy Creek Watershed
HUC: 03150107-120

Watershed Area:	48,708 ac.
Percent of Basin:	3.89%
Type:	Forest
County-Headwaters:	Coosa
County-Mouth:	Coosa
Municipalities:	Goodwater Rockford
Total Population:	1,656
Percent of Basin:	1.51%

Land Use

Lakes and Ponds	127 ac
Cropland	0 ac
Pastureland	2,922 ac
Forestland	44,539 ac
Urbanized	779 ac
Mined Land	0 ac
Other Land	341 ac

Animal Data

Cattle	600
Dairy	0
Swine	0
Broilers	0
Layers	0
Catfish Acres	64

Domestic Water Data

Septic Tanks	450
Failing Septic Tanks	32
Alternative Systems	0

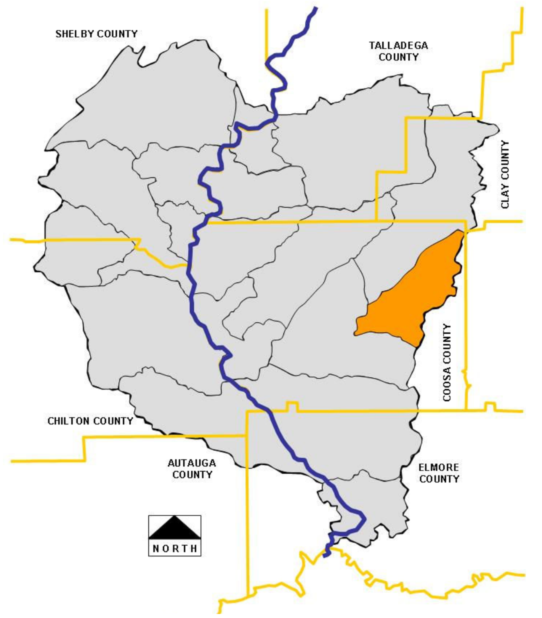
Sediment Loads (in tons)

Total	46,910
Cropland	0
Sand & Gravel Pits	0
Mined Land	0
Developing Urban Land	4,000
Gullies	2,520
Critical Areas	2,500
Streambanks	19,200
Dirt Roads and Banks	2,940
Woodland	15,750

Water Users

Public Water Supply	1
Total Permitted Dischargers	7
Municipal	1
Industrial	6
Mining	0

Socapatoy Creek Watershed Location Map



Impaired Water Bodies..None

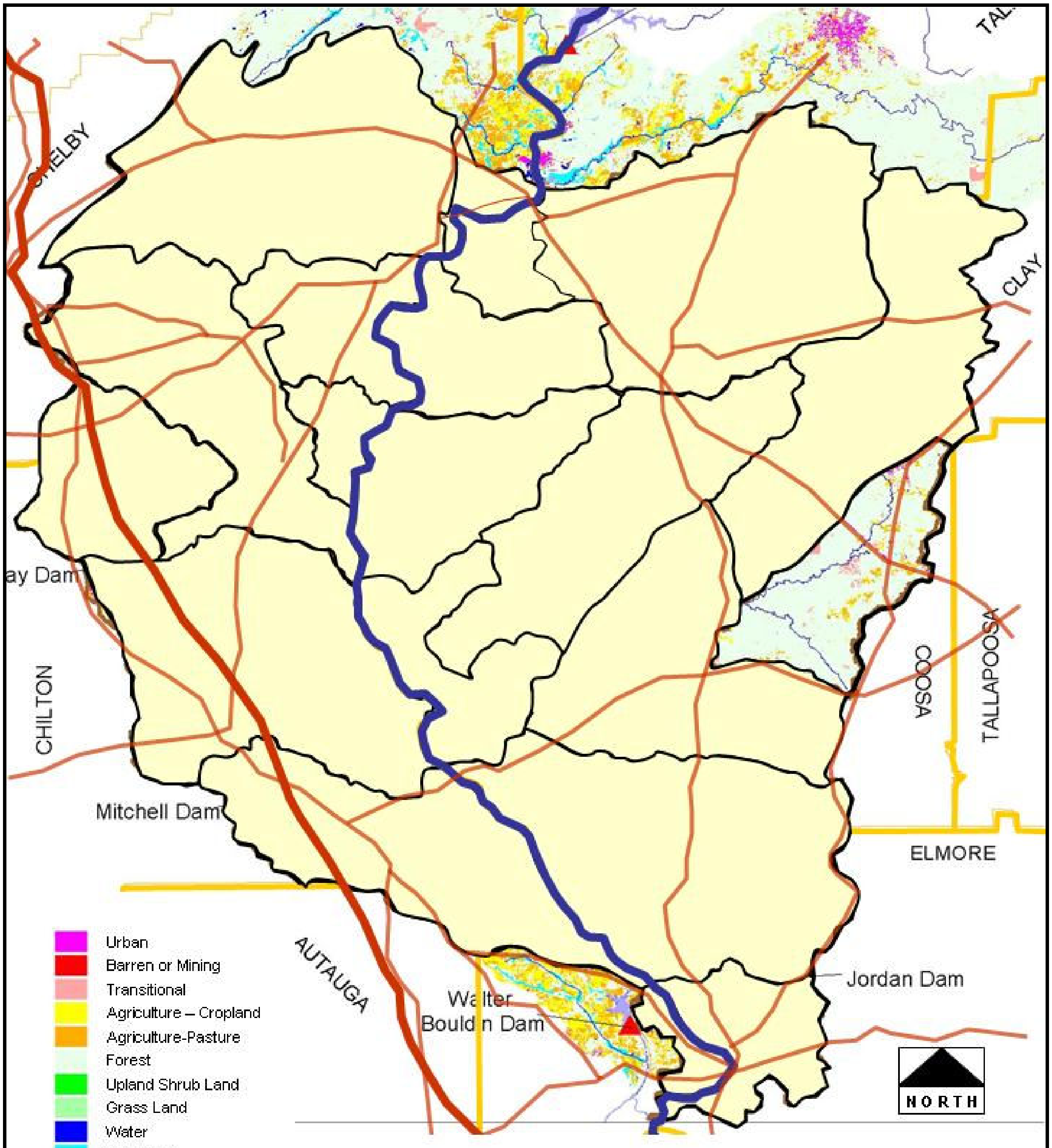
Active Water Quality Monitoring Sites........................0

Suitability for Development............................Moderate

2005 Priority Watershed Rating..............................Low

Major Contributing Factors

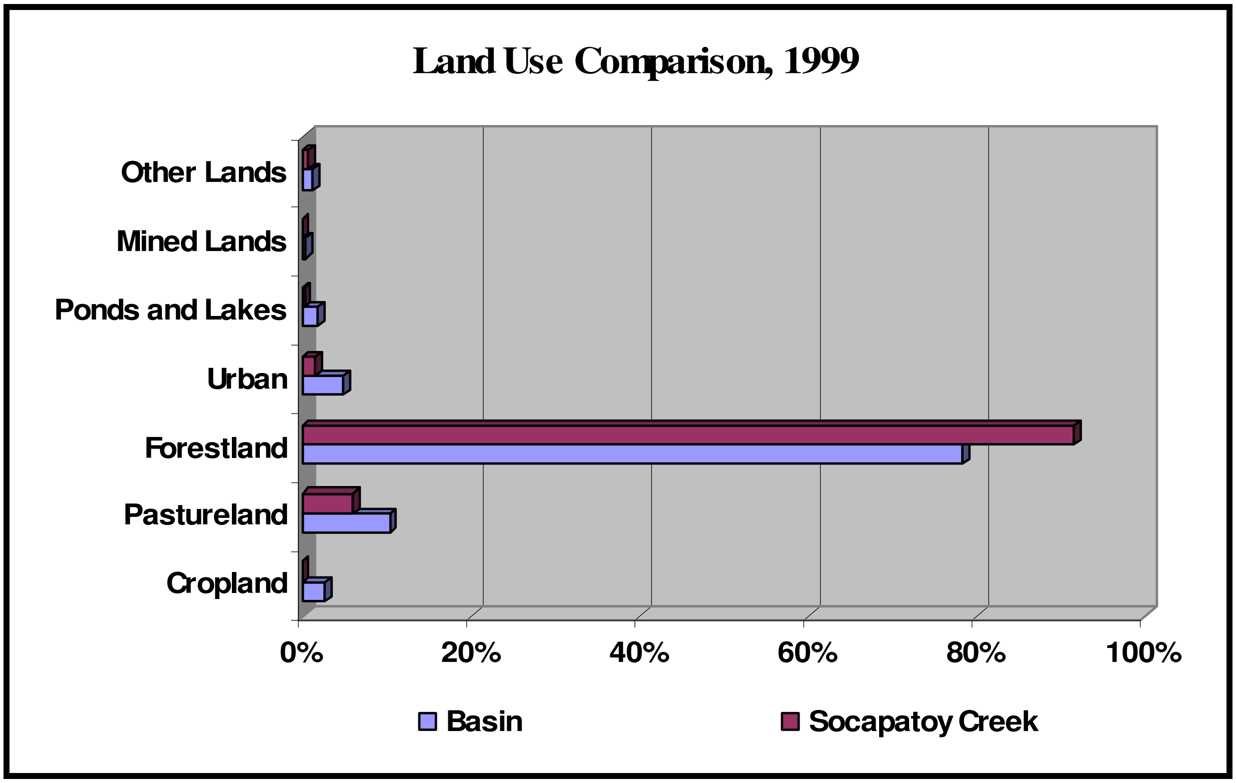
- Alabama Water Watch Water Quality Monitoring and Results
- Septic System Density
- Number of Endangered Species
- High 2000 Unemployment Rate



Socapatoy Creek Watershed
Land Use Map

June 2004

Source: Alabama Department of Environmental Management, August 2004



Land Use Patterns

Overall, the Socapatoy Creek watershed has a forest character, with 91 percent of the land in forested land uses, as compared with 78 percent forested land use in the Basin. This watershed has a high percentage of deciduous forest, at 43.49 percent of the total forest land. The remaining forest land is a combination of mixed forest, at 34.35 percent, and evergreen forest, at 22.16 percent. Of the remaining land, 6 percent is used for pasture purposes and 2 percent is in urban land uses. Agricultural uses include cattle and catfish farming, with 600 head of cattle and 64 acres of catfish farms. Urban land uses include a portion of Rockford at the southernmost tip of the watershed and a portion of Goodwater along the northwest boundary. There are 500 septic systems in the watershed, with a failure rate of 3.0 percent. The septic system density is one system per 97.41 acres, which is moderate in comparison with the other watersheds in the basin. With so much of the land in forest land uses, there is not a discernable pattern of land use, however, it is noted that agricultural land uses are primarily located in the northeastern portion of the watershed. The Socapatoy Creek watershed has the lowest sediment production in the basin, at .96 tons per acre which is equal to 46,911 tons. The majority of the sediment in the watershed comes from streambanks, followed by woodlands. Major roads include U.S. Highway 280, which runs in a northwest-southeast direction in the northern part of the watershed, Alabama Highway 9, which runs north-south in the eastern part of the watershed, Alabama Highway 22, which runs east-west along the southern boundary. Between 1994 and 2002, increases in traffic volume on U.S. Highway 280 have been significant, with a 22.79 percent increase west of Highway 9 and a 14.71 percent increase east of Highway 9. Traffic also increased on Highway 9 south of U.S. Highway 280, but decreased north of U.S. Highway 280. Traffic on Highway 22 has remained fairly stable, with smaller increases ranging from 6.79 percent to 14.29 percent.

Soils and Species – 120

The Socapatoy Creek watershed is comprised of soils in two soil associations. The Cecil-Grover-Madison Association is the predominant soil group and found in most of the watershed. In the southwestern corner of the watershed is a small area of soils in the Tallapoosa-Tatum Association. The soil suitability and limitations for selected uses are provided in the table below. For a map of the soil associations in the watershed and in the Lower Coosa River Basin, refer to the Soil Association Map on page 9.

Soil Association Number	**18**	**25**
Soil Association	**Cecil-Grover-Madison**	**Tallapoosa-Tatum**
Dominant Slope, %	2 - 25	6 - 50
Soil Suitability and Major Limitations For:		
Cropland	Poor: slope	Poor: slope, drought
Pastureland	Good	Poor: slope
Woodland	Good	Good
Soil Limitations For:		
Septic Systems	Moderate: percs slowly	Severe: slope, depth to bedrock
Local Roads and Streets	Moderate: low strength	Severe: slope
Small Commercial Buildings	Severe: slope	Severe: slope
Dwellings without Basements	Moderate: slope	Severe: slope
Camp Areas	Moderate: slope	Severe: slope
Picnic Areas	Moderate: slope	Severe: slope
Playgrounds	Severe: slope	Severe: slope
Paths and Trails	Slight	Severe: slope

The entire Socapatoy Creek watershed is located in the Piedmont Level III Ecoregion, in Southern Inner Piedmont Level IV sub-coercion. In addition to the protected species found throughout the Lower Coosa River Basin (listed on page 14), the following protected species are found in the Socapatoy Creek watershed.

Common Name	**Scientific Name**	**Distribution in Lower Coosa River Basin**
Coldwater Darter	*Etheostoma ditrema*	(1) Spring-dwelling race-Shelby to Coosa Counties (2) Stream race-Waxahatchee Creek tribs, Shelby County; Coosa River tribs, Coosa County
Bachman's Sparrow	*Aimophila aestivalis*	Coastal Plain and Piedmont province
Bald Eagle	*Haliaeetus leucocephalus*	Coastal Plain and Piedmont province
Meadow Jumping Mouse	*Zapus hudsonius*	Chilton, Coosa and Elmore Counties
Mud Elimia	*Elimia alabamensis*	Shelby, Talladega, Chilton, Coosa Counties
Hidden Pebblesnail	*Somatogyrus decipiens*	Chilton, Coosa Counties. May be extinct.
Nevius Stonecrop	*Sedum nevii*	Chilton, Coosa, Talladega Counties
Horse-nettle	*Solanum carolinense* var. *hirsutum*	Chilton, Coosa Counties

Population - Urban / Rural	Number	Percent
Total Population	1,656	100.00%
Urban	0	0.00%
Rural	1,656	100.00%
Farm	123	7.43%
Nonfarm	1,533	92.57%

Population By Race	Number	Percent
Total Population	1,656	100.00%
White	783	47.27%
Black	861	51.98%
American Indian / Alaskan	2	0.09%
Asian	0	0.00%
Native Hawaiian / Pacific Isl.	0	0.00%
Some Other Race	0	0.00%
Two or More Races	11	0.66%

Population By Age	Number	Percent
Total Population	1,656	100.00%
Under 18	430	25.99%
18 to 29 Years	194	11.73%
30 to 49 Years	489	29.53%
50 to 64 Years	279	16.87%
65 Years and Older	263	15.88%

Population in Households	Number	Percent
Total Population	1,656	100.00%
Population In households	1,640	99.00%
In Family Households	1,423	86.77%
In NonFamily Households	217	13.23%
In Group Quarters	17	1.00%
Institutionalized	17	100.00%
Noninstitutionalized	0	0.00%

Educational Attainment	Number	Percent
Total Population (25 & Over)	1,108	100.00%
No schooling completed	37	3.33%
Some School, No Diploma	407	36.78%
High School Graduate, GED	377	34.03%
Some College, No Degree	125	11.27%
Associate degree	68	6.15%
Bachelor's degree	58	5.23%
Master's degree	27	2.40%
Professional school degree	6	0.57%
Doctorate degree	3	0.25%

Place of Birth	Number	Percent
Total	1,656	100.00%
Native	1,653	99.83%
Born in Alabama	1,525	92.24%
Born in Northeast	2	0.09%
Born in Midwest	20	1.20%
Born in South	97	5.89%
Born in West	6	0.36%
Born outside US	4	0.21%
Foreign Born	3	0.17%
Naturalized citizen	2	54.55%
Not a citizen	1	45.45%

Residence in 1995	Number	Percent
Total Population (5 and Over)	1,563	100.00%
Same house in 1995	1,066	68.20%
Different house in 1995	497	31.80%
In United States in 1995	497	99.90%
Same County	230	46.28%
Different county	267	53.72%
Different county; Same state	211	42.40%
Different state	56	11.32%
Different state; Northeast	0	0.00%
Different state; Midwest	6	9.78%
Different state; South	44	77.60%
Different state; West	7	12.62%
Elsewhere	1	0.10%

Median Family Income, 1999	$32,255
Median Household Income, 1999	$27,927
Median Per Capita Income, 1999	$14,149

Employment Status	Number	Percent
Population (16 and over)	1,256	100.00%
In labor force	651	51.81%
In Armed Forces	1	0.08%
Civilian	650	99.92%
Civilian; Employed	608	93.56%
Civilian; Unemployed	42	6.44%
Not in labor force	605	48.19%

Place of Work	Number	Percent
Workers (16 and over)	600	100.00%
Worked in Alabama	598	99.58%
In county of residence	190	31.82%
Outside county of residence	407	68.18%
Worked outside Alabama	3	0.42%

Transportation To Work	Number	Percent
Workers (16 and Over)	600	100.00%
Car; truck; or van	581	96.79%
Drove alone	514	88.51%
Carpooled	67	11.49%
Public transportation	0	0.00%
Motorcycle	0	0.00%
Bicycle	0	0.00%
Walked	4	0.67%
Other means	6	0.93%
Worked at home	10	1.62%

Travel Time to Work	Number	Percent
Total Workers (16 and over)	600	100.00%
Did Not Work at Home	590	98.38%
Less than 5 minutes	20	3.38%
5 to 9 minutes	41	6.86%
10 to 14 minutes	65	11.08%
15 to 19 minutes	108	18.27%
20 to 24 minutes	140	23.79%
25 to 29 minutes	28	4.79%
30 to 34 minutes	94	16.00%
35 to 39 minutes	12	1.97%
40 to 44 minutes	6	1.02%
45 to 59 minutes	20	3.40%
60 to 89 minutes	28	4.70%
90 or more minutes	28	4.75%
Worked at Home	10	1.62%

Employment By Industry	Number	Percent
Employed, 16 and Over	608	100.00%
Agri; Forestry; Fish/Hunt	10	1.59%
Mining	5	0.77%
Construction	17	2.83%
Manufacturing	297	48.77%
Wholesale Trade	17	2.80%
Retail Trade	64	10.48%
Transportation/Warehousing	18	2.99%
Utilities	5	0.86%
Information	0	0.00%
Finance and Insurance	5	0.84%
Real Estate	2	0.25%
Prof; Scientific; Tech Svcs	5	0.74%
Mgmt of Companies/Ent	3	0.45%
Admin; Waste Mgmt Svcs	11	1.77%
Educational Services	46	7.48%
Health Care/Social Assist.	43	7.07%
Arts; Entertainment; Rec	0	0.00%
Accommodation/Food Svcs	13	2.11%
Public Administration	26	4.30%
Other Services	24	3.90%

Median Year Structure Built	1974

Housing	Number	Percent
Total Housing Units	727	100.00%
Urban	0	0.00%
Rural	727	100.00%

Housing Occupancy	Number	Percent
Total	727	100.00%
Occupied	624	85.87%
Owner Occupied	501	80.21%
Renter Occupied	124	19.79%
Vacant	103	14.13%
For Rent	19	18.79%
For Sale Only	9	8.67%
Rented or Sold;	3	2.43%
For Seasonal Use	39	38.22%
For Migrant Workers	2	1.70%
Other vacant	31	30.19%

Household Size	Number	Percent
Total Occupied Housing Units	624	100.00%
1-person household	173	27.64%
2-person household	191	30.57%
3-person household	133	21.24%
4-person household	72	11.49%
5-person household	33	5.23%
6-person household	10	1.54%
7-or-more-person household	14	2.29%

Average Household Size	# Persons
All Housing Units	2.57
Owner occupied	2.72
Renter occupied	2.01

Units & Rooms in Structure	Number	Percent
Housing units: Total	727	100.00%
1 Unit - Detached	479	65.86%
1 Unit - Attached	3	0.34%
2 units in structure	8	1.16%
3 or 4 units in structure	32	4.43%
5 to 9 units in structure	1	0.17%
10 to 19 units in structure	1	0.07%
20 to 49 units in structure	1	0.10%
50 or more units in structure	0	0.00%
Mobile home	201	27.63%
Boat; RV; van; etc.	2	0.24%
Median number of rooms		5.53

House Heating Fuel	Number	Percent
Total Occupied Housing Units	624	100.00%
Utility gas	135	21.66%
Bottled; tank; or LP gas	226	36.17%
Electricity	247	39.49%
Fuel oil; kerosene; etc.	3	0.52%
Coal or coke	0	0.00%
Wood	11	1.82%
Solar energy	0	0.00%
Other fuel	0	0.00%
No fuel used	2	0.34%

Telephone Service	Number	Percent
Total Occupied Housing Units	624	100.00%
Telephone Service Available	583	93.31%
No Telephone Service Available	42	6.69%

Vehicles Available	Number	Percent
Total Occupied Housing Units	624	100.00%
No vehicle available	65	10.42%
1 vehicle available	181	29.04%
2 vehicles available	257	41.14%
3 vehicles available	73	11.64%
4 vehicles available	30	4.72%
5 or more vehicles available	19	3.04%

Plumbing Facilities	Number	Percent
Total Housing Units	727	100.00%
Complete plumbing facilities	725	99.66%
Lacking complete plumbing facilities	3	0.34%

Kitchen Facilities	Number	Percent
Total Housing Units	727	100.00%
Complete kitchen facilities	721	99.21%
Lacking complete kitchen facilities	6	0.79%

Rating and Issues – 120

Criteria	Rating
Impaired Water Bodies	1
ADEM Basin Assessment Rating for NPS Potential	1
NRCS Priority Watershed	1
AWW Water Quality Monitoring and Results	5
Use Classification	3
Land Use Character	1
Potential for Silviculture	3
Sediment Loads	1
Animal Density	1
Soil Suitability for Development	3
Growth Rate of County	2
Increase in Traffic Volume	3
Number of Permitted Dischargers	2
Presence of Hydroelectric Dam	1
Housing Density	3
Septic System Density	5
Number of Endangered Species	4
2000 Unemployment Rate	4
Total	**44 Low**

With a rating score of 44, the Socapatoy Creek watershed is considered to be a low priority watershed in the Lower Coosa River Basin. For more information on the watershed rating and ranking system, refer to the *Lower Coosa River Basin Management Plan*, Part IV, Chapter 12: Priority Watersheds.

A total of 23 issues were identified in the Lower Coosa River Basin. Of these, seven are present in the Socapatoy Creek watershed, of which five are basinwide issues, one is a regional issue, and one is a local concern. The focus of the regional watershed management measures for this watershed is mitigating silviculture runoff and water quality improvement.

Refer to the Lower Coosa River Basin Management Plan, Part IV, Chapter 14: Water Quality Improvement Strategy for management measures that may be implemented in this watershed.

Basinwide Issues:

- Endangered Species
- Lack of Water Quality Trend Data
- Illegal Dumping
- Lack of Education and Awareness
- FERC Relicensing of Hydroelectric Facilities

Regional Issues:

- Sivliculture Runoff

Local Concerns:

- Bacteria

Middle Hatchet Creek Watershed

HUC: 03150107-130

Watershed Area:	84,188 ac.
Percent of Basin:	6.73%
Type:	Forest
County-Headwaters:	Coosa
County-Mouth:	Coosa
Municipalities:	Rockford
Total Population:	1,445
Percent of Basin:	1.32%

Land Use

Lakes and Ponds	842 ac
Cropland	0 ac
Pastureland	3,368 ac
Forestland	77,452 ac
Urbanized	1,684 ac
Mined Land	0 ac
Other Land	842 ac

Animal Data

Cattle	870
Dairy	0
Swine	0
Broilers	0
Layers	0
Catfish Acres	60

Domestic Water Data

Septic Tanks	500
Failing Septic Tanks	15
Alternative Systems	0

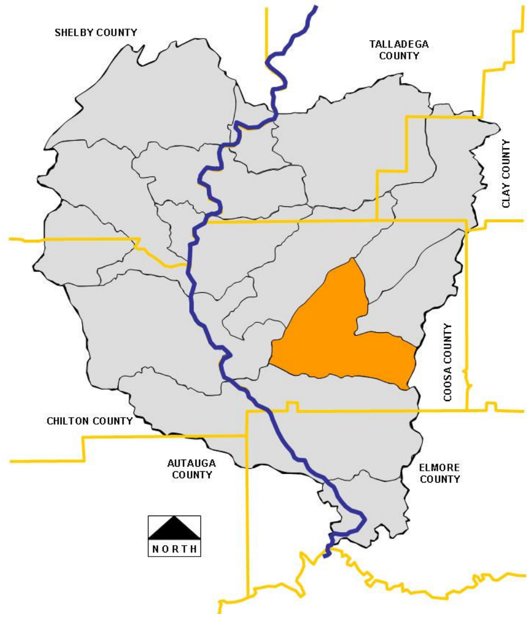
Sediment Loads (in tons)

Total	123,610
Cropland	0
Sand & Gravel Pits	0
Mined Land	0
Developing Urban Land	0
Gullies	0
Critical Areas	6,720
Streambanks	20,400
Dirt Roads and Banks	5,640
Woodland	80,850

Water Users

Public Water Supply	0
Total Permitted Dischargers	4
Municipal	1
Industrial	2
Mining	1

Middle Hatchet Creek Watershed Location Map



Impaired Water Bodies..None

Active Water Quality Monitoring Sites........................0

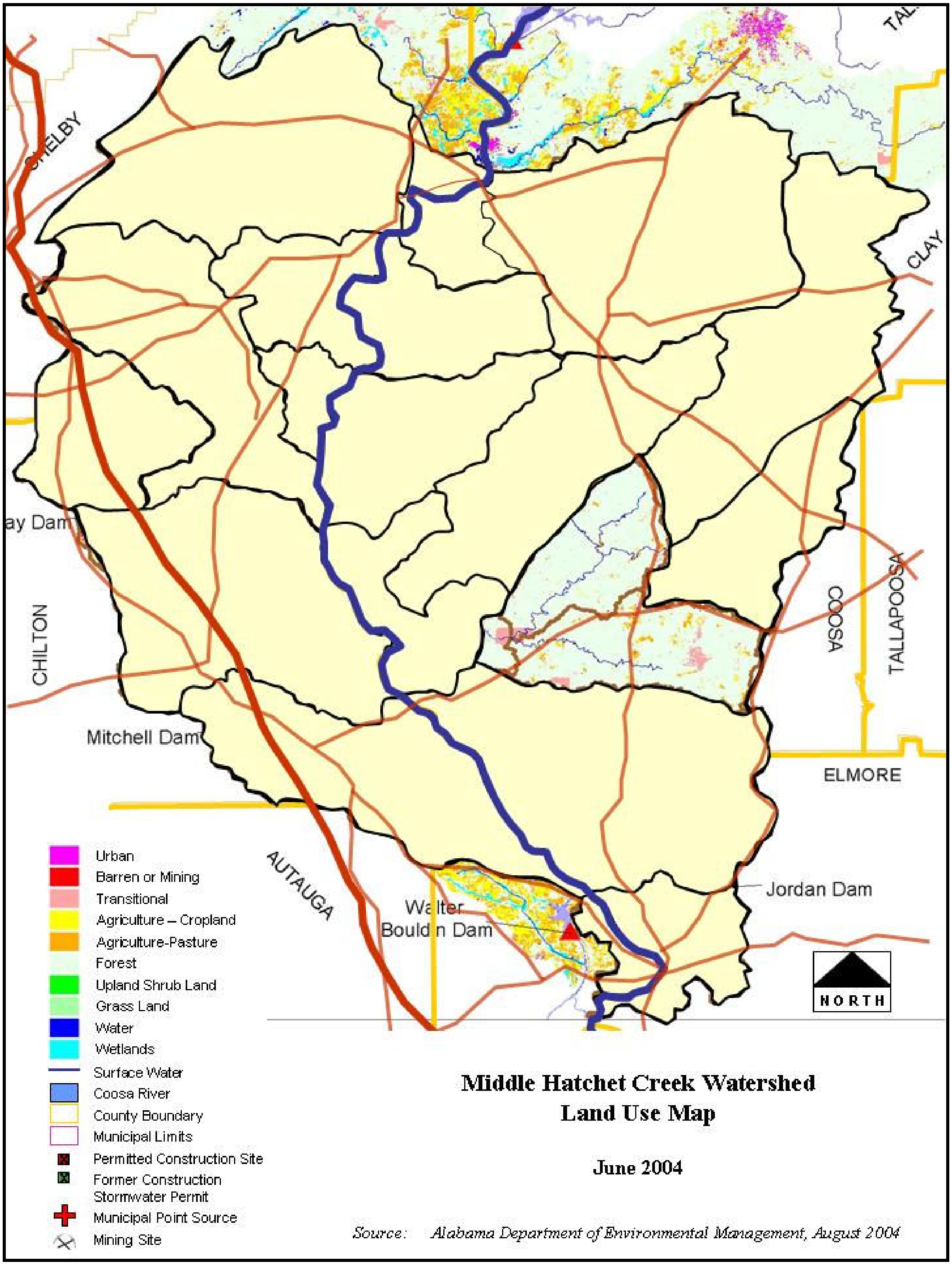
Suitability for Development............................Moderate

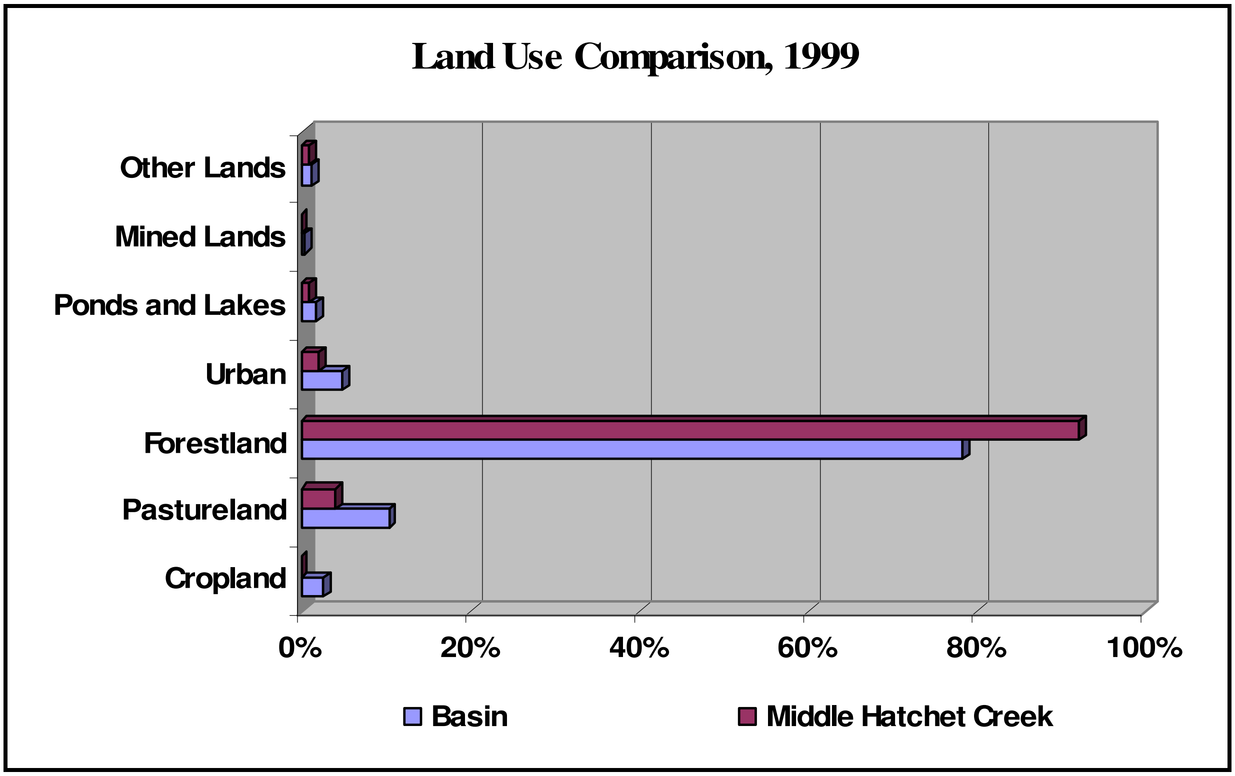
2005 Priority Watershed Rating..............................Low

<u>Major Contributing Factors</u>

- Alabama Water Watch Water Quality Monitoring and Results
- Use Classification
- Septic System Density
- Number of Endangered Species

Land Use – 130


SHELBY
TAL
CLAY
CHILTON
COOSA
TALLAPOOSA
ELMORE
AUTAUGA
ay Dam
Mitchell Dam
Jordan Dam
Walter Bouldin Dam
NORTH
Urban
Barren or Mining
Transitional
Agriculture – Cropland
Agriculture-Pasture
Forest
Upland Shrub Land
Grass Land
Water
Wetlands
Surface Water
Coosa River
County Boundary
Municipal Limits
Permitted Construction Site
Former Construction Stormwater Permit
Municipal Point Source
Mining Site
Middle Hatchet Creek Watershed
Land Use Map
June 2004
Source: Alabama Department of Environmental Management, August 2004



Land Use Patterns

The Middle Hatchet Creek watershed is forest in character, with the highest percentage of forest land use of any of the 20 watersheds in the basin, at 92 percent. This watershed also has the second highest percentage of deciduous forest land, at 45.64 percent of the total forest land use. Of the remaining 54.36 percent of the forest land, 32.71 percent is mixed forest and 21.65 percent is evergreen forest, indicating a high potential for active silviculture in the watershed. In comparison, other land uses are minimal with 4 percent of the land use for pasture and 2 percent in urban land uses. There are approximately 870 head of cattle and 60 acres of catfish farms present. Agricultural lands are located in the southern part of the watershed. Urban land uses, which are also located in the southern part of the watershed, include part of Rockford and transitional lands in the vicinity of the Kellys Crossroads community and Swamp Creek. There are 500 septic systems in the watershed, of which 3 percent are failing. Septic system density is moderately low at one system per 168 acres. Sediment production in the basin is also moderately low at 1.47 tons per acre. The major sources of sediment are woodlands, at .96 tons per acre, and streambanks, at .24 tons per acre. Major roads in the watershed include U.S. Highway 231 and Alabama Highway 22. Highway 231 runs north-south through the middle of the watershed and Highway 22 provides east-west access, also through the central part of the watershed. Traffic volume on these roads, between 1994 and 2002, has increased in a stable fashion. U.S. Highway 231 has experienced increases of 4.04 percent and 6.25 percent south and north of Rockford, respectively, and 8.83 percent increase in the Hanover area. Traffic on Highway 22 increased 3.19 percent near Kelly's Crossroads, 14.29 percent east of Rockford and 6.79 percent near the eastern boundary of the watershed.

Soils and Species – 130

The Middle Hatchet Creek watershed is comprised of soils in two soil associations. The western half of the watershed is made up of soils in the Tallapoosa-Tatum Association and the eastern half is made of soils in the Cecil-Grover-Madison Association. The soil suitability and limitations for selected uses are provided in the table below. For a map of the soil associations in the watershed and in the Lower Coosa River Basin, refer to the Soil Association Map on page 9.

Soil Association Number	**18**	**25**
Soil Association	**Cecil-Grover-Madison**	**Tallapoosa-Tatum**
Dominant Slope, %	2 - 25	6 - 50
Soil Suitability and Major Limitations For:		
Cropland	Poor: slope	Poor: slope, drought
Pastureland	Good	Poor: slope
Woodland	Good	Good
Soil Limitations For:		
Septic Systems	Moderate: percs slowly	Severe: slope, depth to bedrock
Local Roads and Streets	Moderate: low strength	Severe: slope
Small Commercial Buildings	Severe: slope	Severe: slope
Dwellings without Basements	Moderate: slope	Severe: slope
Camp Areas	Moderate: slope	Severe: slope
Picnic Areas	Moderate: slope	Severe: slope
Playgrounds	Severe: slope	Severe: slope
Paths and Trails	Slight	Severe: slope

The entire Middle Hatchet Creek watershed is located in the Southern Inner Piedmont Level IV sub-ecoregion of the Piedmont Level III Ecoregion. In addition to the protected species found throughout the Lower Coosa River Basin (listed on page 14), the following protected species are found in the Middle Hatchet Creek watershed.

Common Name	Scientific Name	Distribution in Lower Coosa River Basin
Coldwater Darter	*Etheostoma ditrema*	1. Spring-dwelling race-Shelby to Coosa Counties (2) Stream race-Waxahatchee Creek tribs, Shelby County; Coosa River tribs, Coosa County
Coal Darter	*Percina brevicauda*	Coosa River and Hatchet Creek
Bachman's Sparrow	*Aimophila aestivalis*	Coastal Plain and Piedmont province
Bald Eagle	*Haliaeetus leucocephalus*	Coastal Plain and Piedmont province
Meadow Jumping Mouse	*Zapus hudsonius*	Chilton, Coosa and Elmore Counties
Mud Elimia	*Elimia alabamensis*	Shelby, Talladega, Chilton, Coosa Counties
Hidden Pebblesnail	*Somatogyrus decipiens*	Chilton, Coosa Counties. May be extinct.
Tulotoma Snail	*Tulotoma magnifica*	Near Wetumpka, Elmore County; Weogufka Creek, Hatchet Creek, Coosa County.
Nevius Stonecrop	*Sedum nevii*	Chilton, Coosa, Talladega Counties
Horse-nettle	*Solanum carolinense* var. *hirsutum*	Chilton, Coosa Counties

Demographics – 130

Population - Urban / Rural	Number	Percent
Total Population	1,445	100.00%
Urban	0	0.00%
Rural	1,445	100.00%
Farm	39	2.70%
Nonfarm	1,406	97.30%

Population By Race	Number	Percent
Total Population	1,445	100.00%
White	1,015	70.26%
Black	406	28.07%
American Indian / Alaskan	8	0.53%
Asian	0	0.00%
Native Hawaiian / Pacific Isl.	0	0.00%
Some Other Race	0	0.00%
Two or More Races	16	1.13%

Population By Age	Number	Percent
Total Population	1,445	100.00%
Under 18	348	24.06%
18 to 29 Years	187	12.91%
30 to 49 Years	384	26.61%
50 to 64 Years	291	20.12%
65 Years and Older	236	16.31%

Population in Households	Number	Percent
Total Population	1,445	100.00%
Population In households	1,424	98.53%
In Family Households	1,248	87.64%
In NonFamily Households	176	12.36%
In Group Quarters	21	1.47%
Institutionalized	21	100.00%
Noninstitutionalized	0	0.00%

Educational Attainment	Number	Percent
Total Population (25 & Over)	996	100.00%
No schooling completed	22	2.22%
Some School, No Diploma	251	25.23%
High School Graduate, GED	400	40.20%
Some College, No Degree	162	16.27%
Associate degree	50	5.05%
Bachelor's degree	75	7.56%
Master's degree	24	2.46%
Professional school degree	3	0.30%
Doctorate degree	7	0.72%

Place of Birth	Number	Percent
Total	1,445	100.00%
Native	1,435	99.29%
Born in Alabama	1,262	87.96%
Born in Northeast	6	0.41%
Born in Midwest	31	2.15%
Born in South	116	8.09%
Born in West	14	0.97%
Born outside US	6	0.42%
Foreign Born	10	0.71%
Naturalized citizen	5	49.76%
Not a citizen	5	50.24%

Residence in 1995	Number	Percent
Total Population (5 and Over)	1,356	100.00%
Same house in 1995	923	68.03%
Different house in 1995	434	31.97%
In United States in 1995	431	99.31%
Same County	191	44.29%
Different county	240	55.71%
Different county; Same state	187	43.48%
Different state	53	12.23%
Different state; Northeast	0	0.00%
Different state; Midwest	17	31.34%
Different state; South	33	62.96%
Different state; West	3	5.70%
Elsewhere	3	0.69%

Economics and Employment – 130

Median Family Income, 1999	$43,225
Median Household Income, 1999	$35,157
Median Per Capita Income, 1999	$18,426

Employment Status	Number	Percent
Population (16 and over)	1,116	100.00%
In labor force	624	55.94%
In Armed Forces	3	0.50%
Civilian	621	99.50%
Civilian; Employed	589	94.88%
Civilian; Unemployed	32	5.12%
Not in labor force	492	44.06%

Place of Work	Number	Percent
Workers (16 and over)	580	100.00%
Worked in Alabama	574	99.01%
In county of residence	192	33.41%
Outside county of residence	382	66.59%
Worked outside Alabama	6	0.99%

Transportation To Work	Number	Percent
Workers (16 and Over)	580	100.00%
Car; truck; or van	553	95.41%
Drove alone	502	90.81%
Carpooled	51	9.19%
Public transportation	0	0.00%
Motorcycle	0	0.00%
Bicycle	0	0.00%
Walked	5	0.81%
Other means	6	1.04%
Worked at home	16	2.73%

Travel Time to Work	Number	Percent
Total Workers (16 and over)	580	100.00%
Did Not Work at Home	564	97.27%
Less than 5 minutes	25	4.40%
5 to 9 minutes	28	4.91%
10 to 14 minutes	56	9.92%
15 to 19 minutes	72	12.84%
20 to 24 minutes	105	18.70%
25 to 29 minutes	33	5.91%
30 to 34 minutes	120	21.31%
35 to 39 minutes	14	2.48%
40 to 44 minutes	11	1.93%
45 to 59 minutes	27	4.71%
60 to 89 minutes	42	7.49%
90 or more minutes	30	5.40%
Worked at Home	16	2.73%

Employment By Industry	Number	Percent
Employed, 16 and Over	589	100.00%
Agri; Forestry; Fish/Hunt	15	2.49%
Mining	5	0.80%
Construction	35	5.88%
Manufacturing	202	34.25%
Wholesale Trade	17	2.95%
Retail Trade	62	10.47%
Transportation/Warehousing	29	4.99%
Utilities	16	2.65%
Information	1	0.12%
Finance and Insurance	11	1.80%
Real Estate	3	0.54%
Prof; Scientific; Tech Svcs	19	3.30%
Mgmt of Companies/Ent	0	0.00%
Admin; Waste Mgmt Svcs	6	1.04%
Educational Services	37	6.24%
Health Care/Social Assist.	44	7.41%
Arts; Entertainment; Rec	1	0.22%
Accommodation/Food Svcs	22	3.74%
Public Administration	42	7.10%
Other Services	24	4.02%

Housing – 130

Median Year Structure Built	1976

Housing	Number	Percent
Total Housing Units	814	100.00%
Urban	0	0.00%
Rural	814	100.00%

Housing Occupancy	Number	Percent
Total	814	100.00%
Occupied	586	72.00%
Owner Occupied	467	79.75%
Renter Occupied	119	20.25%
Vacant	228	28.00%
For Rent	6	2.83%
For Sale Only	15	6.76%
Rented or Sold;	3	1.10%
For Seasonal Use	125	54.95%
For Migrant Workers	0	0.00%
Other vacant	78	34.37%

Household Size	Number	Percent
Total Occupied Housing Units	586	100.00%
1-person household	153	26.08%
2-person household	220	37.52%
3-person household	97	16.61%
4-person household	72	12.31%
5-person household	25	4.21%
6-person household	12	2.10%
7-or-more-person household	7	1.17%

Average Household Size	# Persons
All Housing Units	2.40
Owner occupied	2.51
Renter occupied	1.70

Units & Rooms in Structure	Number	Percent
Housing units: Total	814	100.00%
1 Unit - Detached	529	64.97%
1 Unit - Attached	5	0.66%
2 units in structure	0	0.00%
3 or 4 units in structure	44	5.44%
5 to 9 units in structure	1	0.09%
10 to 19 units in structure	2	0.18%
20 to 49 units in structure	0	0.00%
50 or more units in structure	0	0.00%
Mobile home	233	28.66%
Boat; RV; van; etc.	0	0.00%
Median number of rooms		5.44

House Heating Fuel	Number	Percent
Total Occupied Housing Units	586	100.00%
Utility gas	75	12.75%
Bottled; tank; or LP gas	260	44.40%
Electricity	223	38.07%
Fuel oil; kerosene; etc.	6	1.03%
Coal or coke	0	0.00%
Wood	22	3.75%
Solar energy	0	0.00%
Other fuel	0	0.00%
No fuel used	0	0.00%

Telephone Service	Number	Percent
Total Occupied Housing Units	586	100.00%
Telephone Service Available	543	92.68%
No Telephone Service Available	43	7.32%

Vehicles Available	Number	Percent
Total Occupied Housing Units	586	100.00%
No vehicle available	50	8.53%
1 vehicle available	153	26.08%
2 vehicles available	220	37.52%
3 vehicles available	110	18.71%
4 vehicles available	43	7.41%
5 or more vehicles available	10	1.75%

Plumbing Facilities	Number	Percent
Total Housing Units	814	100.00%
Complete plumbing facilities	810	99.50%
Lacking complete plumbing facilities	4	0.50%

Kitchen Facilities	Number	Percent
Total Housing Units	814	100.00%
Complete kitchen facilities	802	98.46%
Lacking complete kitchen facilities	13	1.54%

Rating and Issues – 130

Criteria	Rating
Impaired Water Bodies	1
ADEM Basin Assessment Rating for NPS Potential	1
NRCS Priority Watershed	1
AWW Water Quality Monitoring and Results	5
Use Classification	5
Land Use Character	1
Potential for Silviculture	3
Sediment Loads	1
Animal Density	1
Soil Suitability for Development	3
Growth Rate of County	2
Increase in Traffic Volume	2
Number of Permitted Dischargers	2
Presence of Hydroelectric Dam	1
Housing Density	2
Septic System Density	5
Number of Endangered Species	4
2000 Unemployment Rate	3
Total	**43 Low**

With a rating score of 43, the Middle Hatchet Creek watershed is considered to be a low priority watershed in the Lower Coosa River Basin. For more information on the watershed rating and ranking system, refer to the *Lower Coosa River Basin Management Plan*, Part IV, Chapter 12: Priority Watersheds.

A total of 23 issues were identified in the Lower Coosa River Basin. Of these, nine are present in the Middle Hatchet Creek watershed, of which five are basinwide issues, three are regional issues, and one is a local concern. The focus of the regional watershed management measures for this watershed is mitigating silviculture runoff and protection of aquatic habitat.

Refer to the Lower Coosa River Basin Management Plan, Part IV, Chapter 14: Water Quality Improvement Strategy for management measures that may be implemented in this watershed.

Basinwide Issues:
- Endangered Species
- Lack of Water Quality Trend Data
- Illegal Dumping
- Lack of Education and Awareness
- FERC Relicensing of Hydroelectric Facilities

Regional Issues:
- Compliance with the *Recovery Plan for the Mobile River Basin Aquatic Ecosystem*
- Designation as a Critical Habitat
- Sivliculture Runoff

Local Concerns:
- Point Source Discharges

Weogufka Creek Watershed
HUC: 03150107-140

Watershed Area:	78,757 ac.
Percent of Basin:	6.30%
Type:	Forest / Agricultural
County-Headwaters:	Clay Talladega
County-Mouth:	Coosa
Municipalities:	None
Total Population:	3,937
Percent of Basin:	3.59%

Land Use

Lakes and Ponds	179 ac
Cropland	516 ac
Pastureland	8,821 ac
Forestland	67,300 ac
Urbanized	129 ac
Mined Land	158 ac
Other Land	1,654 ac

Animal Data

Cattle	2,460
Dairy	0
Swine	0
Broilers	0
Layers	0
Catfish Acres	200

Domestic Water Data

Septic Tanks	500
Failing Septic Tanks	15
Alternative Systems	0

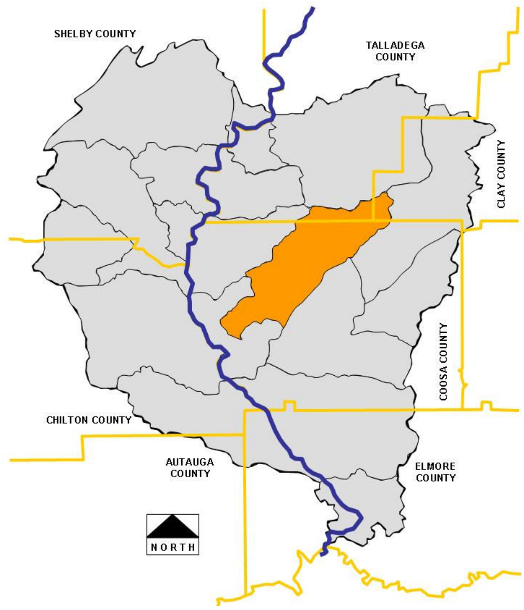
Sediment Loads (in tons)

Total	87,479
Cropland	878
Sand & Gravel Pits	1,400
Mined Land	900
Developing Urban Land	80
Gullies	12,740
Critical Areas	10,375
Streambanks	48,600
Dirt Roads and Banks	9.780
Woodland	2,726

Water Users

Public Water Supply	0
Total Permitted Dischargers	2
Municipal	1
Industrial	1
Mining	0

Weogufka Creek Watershed Location Map



Impaired Water Bodies..None

Active Water Quality Monitoring Sites........................0

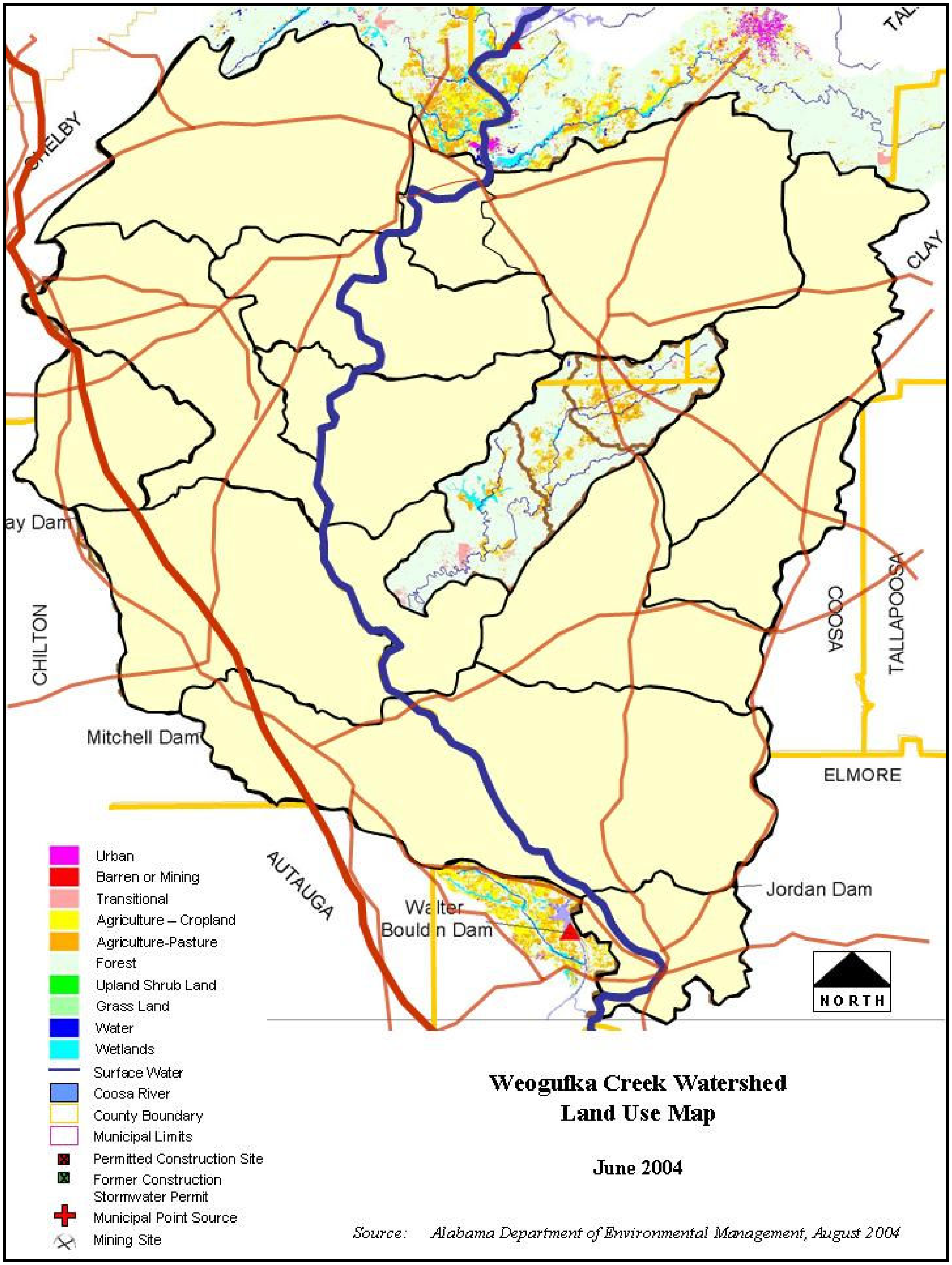
Suitability for Development..................................Poor

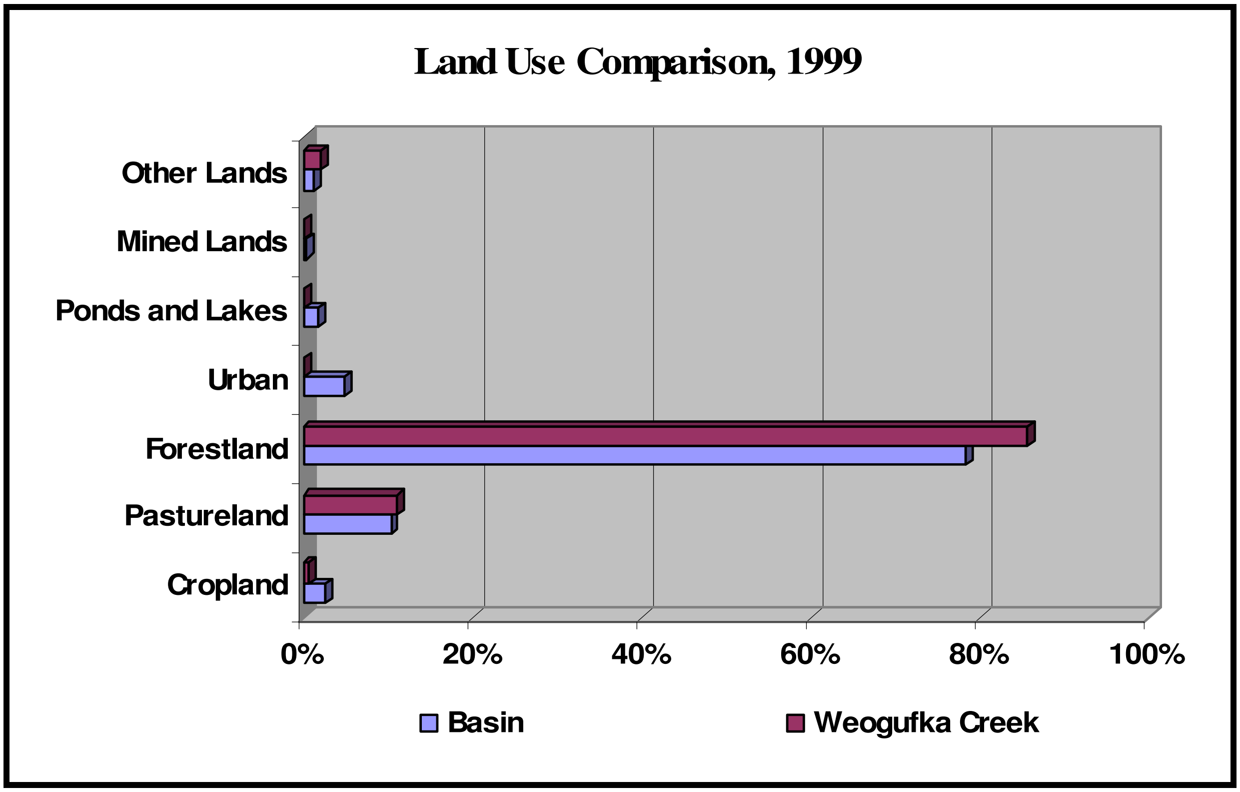
2005 Priority Watershed Rating...................... Moderate

Major Contributing Factors

- NRCS Priority Watershed
- Use Classification
- Soil Suitability for Development
- Septic System Density
- Housing Density
- Number of Endangered Species

Land Use – 140


TAL
SHELBY
CLAY
ay Dam
CHILTON
COOSA
TALLAPOOSA
Mitchell Dam
ELMORE
AUTAUGA
Jordan Dam
Walter Bouldin Dam
NORTH
Urban
Barren or Mining
Transitional
Agriculture – Cropland
Agriculture-Pasture
Forest
Upland Shrub Land
Grass Land
Water
Wetlands
Surface Water
Coosa River
County Boundary
Municipal Limits
Permitted Construction Site
Former Construction Stormwater Permit
Municipal Point Source
Mining Site
Weogufka Creek Watershed
Land Use Map
June 2004
Source: Alabama Department of Environmental Management, August 2004



Land Use Patterns

The Weogufka Creek watershed is primarily forest in character with a secondary agricultural character. Of the total land in the watershed, 85 percent is in forest land uses and 12 percent is in agricultural land uses, as compared to 78 percent and 10 percent, respectively, of the total land in the basin. A fairly high percentage of the forest land use is deciduous forest, at 45.23 percent, while the remaining forest land uses are 33.64 percent mixed forest and 21.12 percent evergreen forest. The percentage of mixed and evergreen forest indicates a high potential for active silviculture in the watershed. A large portion of the Weogufka State Forest is also located within the watershed boundaries. Agricultural land uses are located within the central portion of the watershed in the vicinity of Weogufka Creek. Most of the agricultural land uses, at 11 percent, are used for pasture purposes. There are approximately 2,460 head of cattle and 55 swine in the watershed, along with 200 acres of catfish farms. Only 1 percent of the land is used for crop production. There is no urban land use within the watershed. There are 500 septic systems, of which 3.00 percent are estimated to be failing. The Weogufka Creek watershed has the second lowest sediment production of the 20 watersheds in the basin, at 1.06 tons per acre. The major sources of sediment is streambanks, at .59 tons per acre, followed distantly by gullies, at .15 tons per acre; critical areas, at .13 tons per acre; and, dirt roads and road banks, at .12 tons per acre. Major roads include U.S. Highways 280 and 231, both of which are located in the northern part of the watershed. Traffic volume on Highway 280 increased by 29.53 percent between 1994 and 2002 at a point measured just south of the Coosa County line. Traffic volume was not measured on Highway 231 within the watershed, however, traffic volume measured north and south of the watershed indicated significant increases in traffic traveling through the Weogufka watershed, ranging from a 15.65 percent increase to the north and a 8.83 percent increase to the south.

Soils and Species – 140

The Weogufka Creek watershed is comprised of soils in the Tallapoosa-Tatum Association. The soil suitability and limitations for selected uses are provided in the table below. For a map of the soil associations in the watershed and in the Lower Coosa River Basin, refer to the Soil Association Map on page 9.

Soil Association Number	25
Soil Association	Tallapoosa-Tatum
Dominant Slope, %	6 - 50
Soil Suitability and Major Limitations For:	
Cropland	Poor: slope, drought
Pastureland	Poor: slope
Woodland	Good
Soil Limitations For:	
Septic Systems	Severe: slope, depth to bedrock
Local Roads and Streets	Severe: slope
Small Commercial Buildings	Severe: slope
Dwellings without Basements	Severe: slope
Camp Areas	Severe: slope
Picnic Areas	Severe: slope
Playgrounds	Severe: slope
Paths and Trails	Severe: slope

The entire Weogufka Creek watershed is located in the Southern Inner Piedmont Level IV sub-ecoregion of the Piedmont Level III Ecoregion. In addition to the protected species found throughout the Lower Coosa River Basin (listed on page 14), the following protected species are found in the Weogufka Creek watershed.

Common Name	Scientific Name	Distribution in Lower Coosa River Basin
Blue Shiner	*Cyprimella caerulea*	Weogufka Creek
Coldwater Darter	*Etheostoma ditrema*	(1) Spring-dwelling race-Shelby to Coosa Counties (2) Stream race-Waxahatchee Creek tribs, Shelby County; Coosa River tribs, Coosa County
Bachman's Sparrow	*Aimophila aestivalis*	Coastal Plain and Piedmont province
Bald Eagle	*Haliaeetus leucocephalus*	Coastal Plain and Piedmont province
Meadow Jumping Mouse	*Zapus hudsonius*	Chilton, Coosa and Elmore Counties
Mud Elimia	*Elimia alabamensis*	Shelby, Talladega, Chilton, Coosa Counties
Upland Hornsnail	*Pleurocera showalteri*	Shelby and Talladega Counties
Hidden Pebblesnail	*Somatogyrus decipiens*	Chilton, Coosa Counties. May be extinct.
Dwarf Pebblesnail	*Somatogyrus nanus*	Main stem throughout basin. Weogufka Creek, Elmore County.
Tulotoma Snail	*Tulotoma magnifica*	Near Wetumpka, Elmore County; Weogufka Creek, Hatchet Creek, Coosa County.
Nevius Stonecrop	*Sedum nevii*	Chilton, Coosa, Talladega Counties
Horse-nettle	*Solanum carolinense* var. *hirsutum*	Chilton, Coosa Counties
Roundleaf Meadowrue	*Thalictrum subrotundum*	Autauga, Clay Counties

Demographics – 140

Population - Urban / Rural	Number	Percent
Total Population	3,937	100.00%
Urban	5	0.13%
Rural	3,932	99.87%
Farm	92	2.34%
Nonfarm	3,840	97.66%

Population By Race	Number	Percent
Total Population	3,937	100.00%
White	3,328	84.53%
Black	578	14.68%
American Indian / Alaskan	16	0.41%
Asian	0	0.00%
Native Hawaiian / Pacific Isl.	0	0.00%
Some Other Race	8	0.20%
Two or More Races	7	0.17%

Population By Age	Number	Percent
Total Population	3,937	100.00%
Under 18	1,051	26.70%
18 to 29 Years	618	15.71%
30 to 49 Years	1,222	31.05%
50 to 64 Years	661	16.78%
65 Years and Older	384	9.76%

Population in Households	Number	Percent
Total Population	3,937	100.00%
Population In households	3,935	99.94%
In Family Households	3,532	89.77%
In NonFamily Households	403	10.23%
In Group Quarters	2	0.06%
Institutionalized	2	100.00%
Noninstitutionalized	0	0.00%

Educational Attainment	Number	Percent
Total Population (25 & Over)	2,530	100.00%
No schooling completed	34	1.36%
Some School, No Diploma	837	33.06%
High School Graduate, GED	949	37.51%
Some College, No Degree	424	16.74%
Associate degree	92	3.65%
Bachelor's degree	147	5.80%
Master's degree	34	1.33%
Professional school degree	8	0.31%
Doctorate degree	6	0.24%

Place of Birth	Number	Percent
Total	3,937	100.00%
Native	3,929	99.79%
Born in Alabama	3,472	88.39%
Born in Northeast	38	0.96%
Born in Midwest	69	1.76%
Born in South	276	7.02%
Born in West	65	1.66%
Born outside US	8	0.21%
Foreign Born	8	0.21%
Naturalized citizen	7	77.84%
Not a citizen	2	22.16%

Residence in 1995	Number	Percent
Total Population (5 and Over)	3,646	100.00%
Same house in 1995	2,500	68.55%
Different house in 1995	1,147	31.45%
In United States in 1995	1,144	99.74%
Same County	601	52.58%
Different county	542	47.42%
Different county; Same state	456	39.84%
Different state	87	7.58%
Different state; Northeast	3	3.46%
Different state; Midwest	4	4.73%
Different state; South	80	91.81%
Different state; West	0	0.00%
Elsewhere	3	0.26%

Economics and Employment – 140

Median Family Income, 1999	$38,013
Median Household Income, 1999	$32,698
Median Per Capita Income, 1999	$13,237

Employment Status	Number	Percent
Population (16 and over)	2,994	100.00%
In labor force	1,825	60.96%
In Armed Forces	4	0.19%
Civilian	1,822	99.81%
Civilian; Employed	1,713	94.05%
Civilian; Unemployed	108	5.95%
Not in labor force	1,169	39.04%

Place of Work	Number	Percent
Workers (16 and over)	1,681	100.00%
Worked in Alabama	1,666	99.11%
In county of residence	646	38.75%
Outside county of residence	1,021	61.25%
Worked outside Alabama	15	0.89%

Transportation To Work	Number	Percent
Workers (16 and Over)	1,681	100.00%
Car; truck; or van	1,644	97.80%
Drove alone	1,454	88.45%
Carpooled	190	11.55%
Public transportation	17	1.03%
Motorcycle	0	0.00%
Bicycle	0	0.00%
Walked	10	0.59%
Other means	5	0.27%
Worked at home	5	0.31%

Travel Time to Work	Number	Percent
Total Workers (16 and over)	1,681	100.00%
Did Not Work at Home	1,676	99.69%
Less than 5 minutes	22	1.28%
5 to 9 minutes	97	5.81%
10 to 14 minutes	333	19.84%
15 to 19 minutes	426	25.41%
20 to 24 minutes	226	13.48%
25 to 29 minutes	58	3.45%
30 to 34 minutes	179	10.69%
35 to 39 minutes	26	1.57%
40 to 44 minutes	19	1.12%
45 to 59 minutes	124	7.40%
60 to 89 minutes	104	6.23%
90 or more minutes	62	3.71%
Worked at Home	5	0.31%

Employment By Industry	Number	Percent
Employed, 16 and Over	1,713	100.00%
Agri; Forestry; Fish/Hunt	9	0.51%
Mining	73	4.26%
Construction	193	11.28%
Manufacturing	489	28.54%
Wholesale Trade	75	4.39%
Retail Trade	164	9.57%
Transportation/Warehousing	71	4.12%
Utilities	15	0.89%
Information	21	1.24%
Finance and Insurance	40	2.33%
Real Estate	9	0.54%
Prof; Scientific; Tech Svcs	16	0.95%
Mgmt of Companies/Ent	0	0.00%
Admin; Waste Mgmt Svcs	36	2.10%
Educational Services	115	6.70%
Health Care/Social Assist.	185	10.78%
Arts; Entertainment; Rec	4	0.25%
Accommodation/Food Svcs	87	5.06%
Public Administration	41	2.40%
Other Services	70	4.06%

Median Year Structure Built	1977

Housing	Number	Percent
Total Housing Units	1,754	100.00%
Urban	2	0.09%
Rural	1,752	99.91%

Housing Occupancy	Number	Percent
Total	1,754	100.00%
Occupied	1,518	86.57%
Owner Occupied	1,292	85.10%
Renter Occupied	226	14.90%
Vacant	235	13.43%
For Rent	20	8.54%
For Sale Only	2	0.96%
Rented or Sold;	2	0.85%
For Seasonal Use	103	43.75%
For Migrant Workers	0	0.00%
Other vacant	108	45.91%

Household Size	Number	Percent
Total Occupied Housing Units	1,518	100.00%
1-person household	330	21.76%
2-person household	455	30.00%
3-person household	370	24.35%
4-person household	222	14.65%
5-person household	106	6.98%
6-person household	21	1.41%
7-or-more-person household	13	0.86%

Average Household Size	# Persons
All Housing Units	2.57
Owner occupied	2.58
Renter occupied	2.37

Units & Rooms in Structure	Number	Percent
Housing units: Total	1,754	100.00%
1 Unit - Detached	982	55.99%
1 Unit - Attached	17	0.94%
2 units in structure	0	0.00%
3 or 4 units in structure	4	0.20%
5 to 9 units in structure	0	0.00%
10 to 19 units in structure	0	0.00%
20 to 49 units in structure	0	0.00%
50 or more units in structure	0	0.00%
Mobile home	749	42.72%
Boat; RV; van; etc.	3	0.16%
Median number of rooms		5.37

House Heating Fuel	Number	Percent
Total Occupied Housing Units	1,518	100.00%
Utility gas	125	8.21%
Bottled; tank; or LP gas	710	46.79%
Electricity	653	43.03%
Fuel oil; kerosene; etc.	0	0.00%
Coal or coke	0	0.00%
Wood	30	1.97%
Solar energy	0	0.00%
Other fuel	0	0.00%
No fuel used	0	0.00%

Telephone Service	Number	Percent
Total Occupied Housing Units	1,518	100.00%
Telephone Service Available	1,453	95.68%
No Telephone Service Available	66	4.32%

Vehicles Available	Number	Percent
Total Occupied Housing Units	1,518	100.00%
No vehicle available	89	5.85%
1 vehicle available	369	24.33%
2 vehicles available	608	40.03%
3 vehicles available	309	20.32%
4 vehicles available	107	7.05%
5 or more vehicles available	37	2.42%

Plumbing Facilities	Number	Percent
Total Housing Units	1,754	100.00%
Complete plumbing facilities	1,735	98.94%
Lacking complete plumbing facilities	19	1.06%

Kitchen Facilities	Number	Percent
Total Housing Units	1,754	100.00%
Complete kitchen facilities	1,721	98.12%
Lacking complete kitchen facilities	33	1.88%

Rating and Issues – 140

Criteria	Rating
Impaired Water Bodies	1
ADEM Basin Assessment Rating for NPS Potential	1
NRCS Priority Watershed	5
AWW Water Quality Monitoring and Results	3
Use Classification	5
Land Use Character	2
Potential for Silviculture	3
Sediment Loads	1
Animal Density	3
Soil Suitability for Development	5
Growth Rate of County	2
Increase in Traffic Volume	3
Number of Permitted Dischargers	2
Presence of Hydroelectric Dam	1
Housing Density	4
Septic System Density	5
Number of Endangered Species	4
2000 Unemployment Rate	3
Total	**53 Moderate**

With a rating score of 53, the Weogufka Creek watershed is considered to be a moderate priority watershed in the Lower Coosa River Basin. For more information on the watershed rating and ranking system, refer to the *Lower Coosa River Basin Management Plan*, Part IV, Chapter 12: Priority Watersheds.

A total of 23 issues were identified in the Lower Coosa River Basin. Of these, eight are present in the Weogufka Creek watershed, of which five are basinwide issues and three are regional issues. The focus of the regional watershed management measures for this watershed is mitigation of stormwater runoff and protection of aquatic habitat.

Refer to the Lower Coosa River Basin Management Plan, Part IV, Chapter 14: Water Quality Improvement Strategy for management measures that may be implemented in this watershed.

Basinwide Issues:

- Endangered Species
- Lack of Water Quality Trend Data
- Illegal Dumping
- Lack of Education and Awareness
- FERC Relicensing of Hydroelectric Facilities

Regional Issues:

- Compliance with the *Recovery Plan for the Mobile River Basin Aquatic Ecosystem*
- Agricultural Runoff
- Sivliculture Runoff

Lower Hatchet Creek Watershed
HUC: 03150107-150

Watershed Area:	38,844 ac.
Percent of Basin:	3.11%
Type:	Forest
County-Headwaters:	Coosa
County-Mouth:	Coosa
Municipalities:	None
Total Population:	410
Percent of Basin:	.37%

Land Use

Lakes and Ponds	3,884 ac
Cropland	0 ac
Pastureland	0 ac
Forestland	34,735 ac
Urbanized	97 ac
Mined Land	0 ac
Other Land	128 ac

Animal Data

Cattle	0
Dairy	0
Swine	0
Broilers	0
Layers	0
Catfish Acres	90

Domestic Water Data

Septic Tanks	80
Failing Septic Tanks	1
Alternative Systems	0

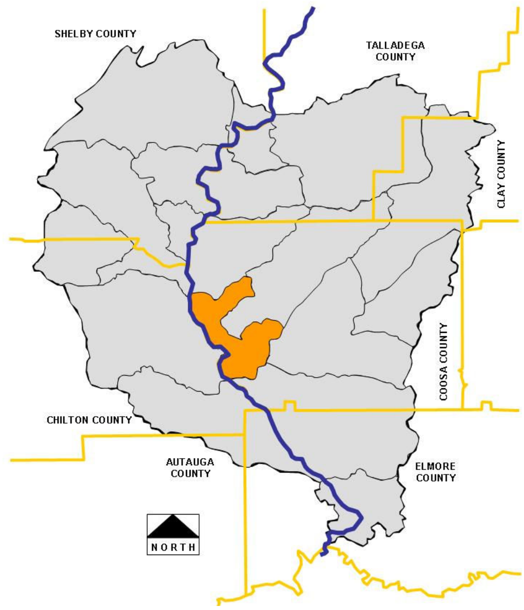
Sediment Loads (in tons)

Total	60,960
Cropland	0
Sand & Gravel Pits	0
Mined Land	0
Developing Urban Land	400
Gullies	840
Critical Areas	500
Streambanks	3,600
Dirt Roads and Banks	4,020
Woodland	51,600

Water Users

Public Water Supply	0
Total Permitted Dischargers	0
Municipal	0
Industrial	0
Mining	0

Lower Hatchet Creek Watershed Location Map



Impaired Water Bodies .... Lake Mitchell

Active Water Quality Monitoring Sites 6

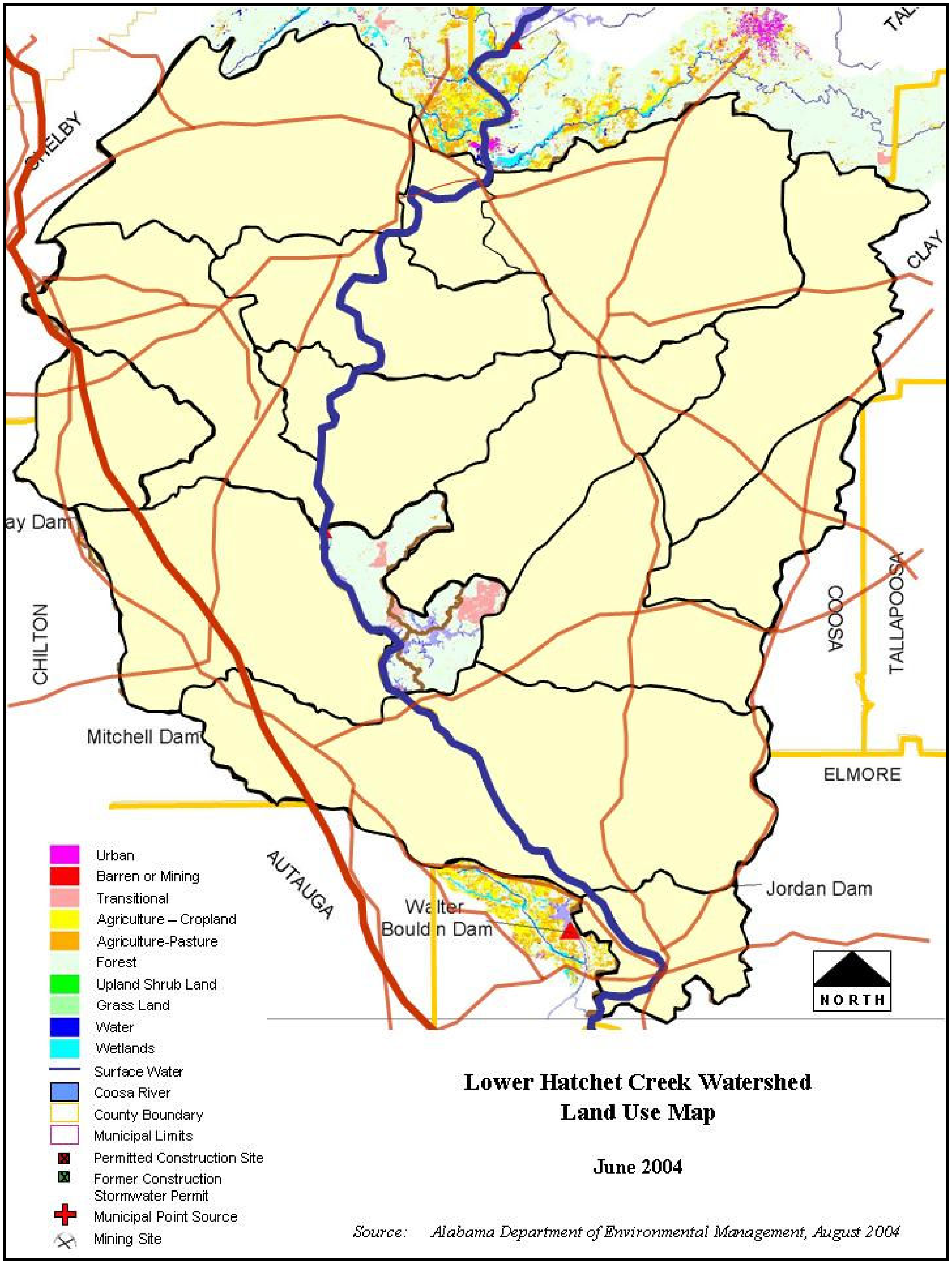
Suitability for Development ....Poor

2005 Priority Watershed Rating .... Moderate

<u>Major Contributing Factors</u>

- Impaired Waterbodies
- Use Classification
- Potential for Silviculture
- Soil Suitability for Development
- Presence of Hydroelectric Dam
- High 2000 Unemployment Rate
- Septic System Density
- Number of Endangered Species

Land Use – 150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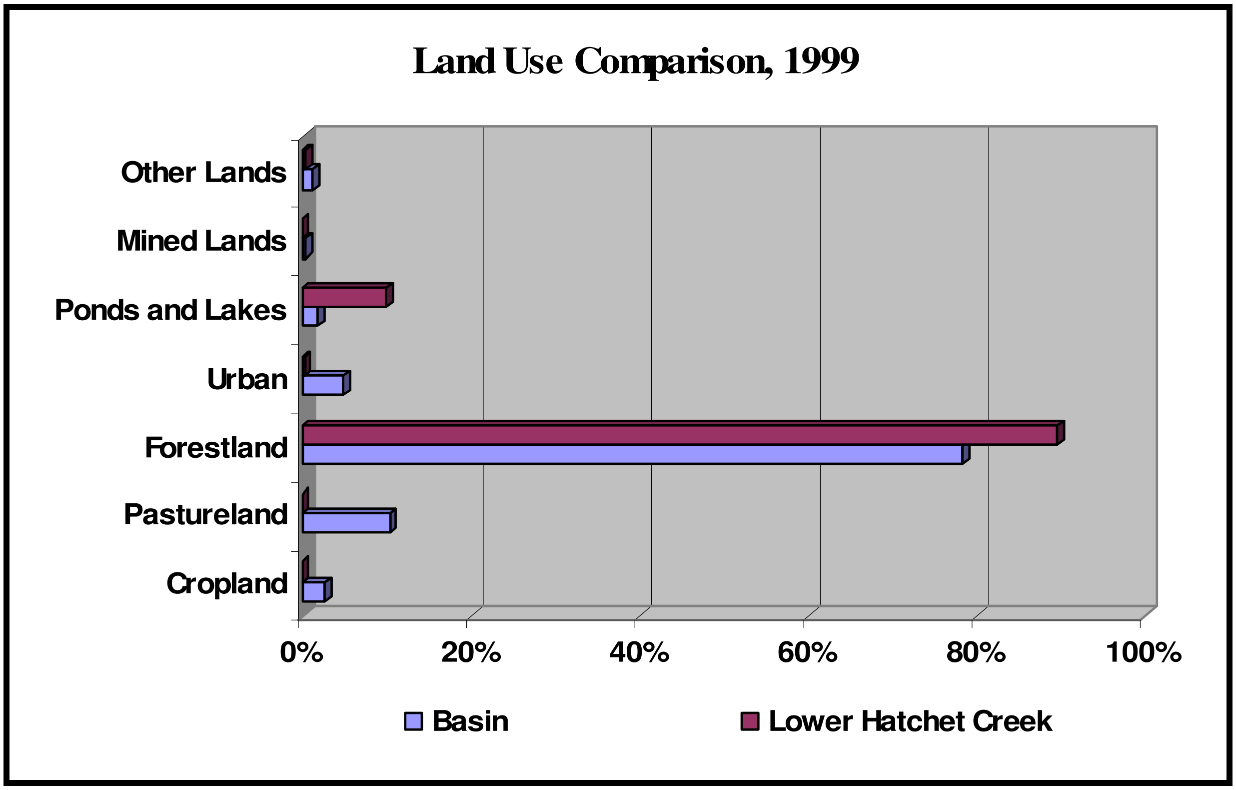
TALLAPOOSA
Mitchell Dam
ELMORE
AUTAUGA
Walter Bouldin Dam
Jordan Dam
NORTH
Urban
Barren or Mining
Transitional
Agriculture – Cropland
Agriculture-Pasture
Forest
Upland Shrub Land
Grass Land
Water
Wetlands
Surface Water
Coosa River
County Boundary
Municipal Limits
Permitted Construction Site
Former Construction Stormwater Permit
Municipal Point Source
Mining Site
Lower Hatchet Creek Watershed
Land Use Map
June 2004
Source: Alabama Department of Environmental Management, August 2004



Land Use Patterns

The Lower Hatchet Creek watershed has an forest character, with 89 percent of the land in forest land uses, as compared with 78 percent of the total land in the basin in forest use. There is also a significantly high percentage of the ponds and lakes in the watershed, at 10 percent, as compared to 2 percent for the entire basin. This accounts for the presence of Lake Mitchell, along with approximately 90 acres of catfish farms. Other than the catfish farms, there is no agricultural land use, nor is there any urban land use, in the watershed. There is, however, some transitional land found in the northeastern part of the watershed surrounding Lake Mitchell. There are approximately 80 septic systems in the watershed, of which 1.25 percent are estimated to be failing. Of the total forest land, there are almost equal parts of deciduous forest, 35.07 percent, evergreen forest, 33.20 percent, and mixed forest, 31.73 percent. The high percentage of evergreen and mixed forest indicates a strong potential for active silviculture in the watershed. Part of the Weogufka State Forest is located within the watershed.

Sediment production in the Lower Hatchet Creek watershed is moderately low, at 1.57 tons per acre. The major source of sediment is woodlands, at 1.33 tons per acre, followed distantly by dirt roads and road banks, at .10 tons per acre, and stream banks, at .09 tons per acre.

There are no major roads present, although Alabama Highway 22 does run east-west just south of the watershed. Therefore, the Lower Hatchet Creek watershed is only accessible by local county roads.

Soils and Species – 150

The Lower Hatchet Creek watershed is comprised of soils in the Tallapoosa-Tatum Association. The soil suitability and limitations for selected uses are provided in the table below. For a map of the soil associations in the watershed and in the Lower Coosa River Basin, refer to the Soil Association Map on page 9.

Soil Association Number	**25**
Soil Association	**Tallapoosa-Tatum**
Dominant Slope, %	6 - 50
Soil Suitability and Major Limitations For:	
Cropland	Poor: slope, drought
Pastureland	Poor: slope
Woodland	Good
Soil Limitations For:	
Septic Systems	Severe: slope, depth to bedrock
Local Roads and Streets	Severe: slope
Small Commercial Buildings	Severe: slope
Dwellings without Basements	Severe: slope
Camp Areas	Severe: slope
Picnic Areas	Severe: slope
Playgrounds	Severe: slope
Paths and Trails	Severe: slope

The entire Lower Hatchet Creek watershed is located in the Southern Inner Piedmont Level IV sub-ecoregion of the Piedmont Level III Ecoregion. In addition to the protected species found throughout the Lower Coosa River Basin (listed on page 14), the following protected species are found in the Lower Hatchet Creek watershed.

Common Name	Scientific Name	Distribution in Lower Coosa River Basin
Coldwater Darter	*Etheostoma ditrema*	(1) Spring-dwelling race-Shelby to Coosa Counties (2) Stream race-Waxahatchee Creek tribs, Shelby County; Coosa River tribs, Coosa County
Coal Darter	*Percina brevicauda*	Coosa River and Hatchet Creek
Bachman's Sparrow	*Aimophila aestivalis*	Coastal Plain and Piedmont province
Bald Eagle	*Haliaeetus leucocephalus*	Coastal Plain and Piedmont province
Meadow Jumping Mouse	*Zapus hudsonius*	Chilton, Coosa and Elmore Counties
Mud Elimia	*Elimia alabamensis*	Shelby, Talladega, Chilton, Coosa Counties
Stocky Pebblesnail	*Somatogyrus crassus*	Main stem in Elmore, Chilton, Coosa Counties. May be extinct.
Hidden Pebblesnail	*Somatogyrus decipiens*	Chilton, Coosa Counties. May be extinct.
Fluted Pebblesnail	*Somatogyrus hendersoni*	Main stem, Coosa, Chilton Counties. May be extinct.
Dwarf Pebblesnail	*Somatogyrus nanus*	Main stem throughout basin. Weogufka Creek, Elmore County.
Moon Pebblesnail	*Somatogyrus obtusus*	Chilton-Coosa County shoals
Tulotoma Snail	*Tulotoma magnifica*	Near Wetumpka, Elmore County; Weogufka Creek, Hatchet Creek, Coosa County.
Nevius Stonecrop	*Sedum nevii*	Chilton, Coosa, Talladega Counties
Horse-nettle	*Solanum carolinense* var. *hirsutum*	Chilton, Coosa Counties

Population - Urban / Rural	Number	Percent
Total Population	410	100.00%
Urban	0	0.00%
Rural	410	100.00%
Farm	13	3.27%
Nonfarm	397	96.73%

Population By Race	Number	Percent
Total Population	410	100.00%
White	360	87.85%
Black	43	10.49%
American Indian / Alaskan	6	1.51%
Asian	0	0.00%
Native Hawaiian / Pacific Isl.	0	0.00%
Some Other Race	0	0.00%
Two or More Races	1	0.15%

Population By Age	Number	Percent
Total Population	410	100.00%
Under 18	83	20.24%
18 to 29 Years	54	13.07%
30 to 49 Years	110	26.78%
50 to 64 Years	83	20.29%
65 Years and Older	80	19.61%

Population in Households	Number	Percent
Total Population	410	100.00%
Population In households	408	99.56%
In Family Households	370	90.64%
In NonFamily Households	38	9.36%
In Group Quarters	2	0.44%
Institutionalized	2	100.00%
Noninstitutionalized	0	0.00%

Educational Attainment	Number	Percent
Total Population (25 & Over)	305	100.00%
No schooling completed	3	0.85%
Some School, No Diploma	83	27.31%
High School Graduate, GED	134	43.99%
Some College, No Degree	53	17.27%
Associate degree	11	3.48%
Bachelor's degree	16	5.25%
Master's degree	4	1.44%
Professional school degree	0	0.00%
Doctorate degree	1	0.39%

Place of Birth	Number	Percent
Total	410	100.00%
Native	410	100.00%
Born in Alabama	349	85.07%
Born in Northeast	1	0.34%
Born in Midwest	12	2.83%
Born in South	45	10.98%
Born in West	3	0.78%
Born outside US	0	0.00%
Foreign Born	0	0.00%
Naturalized citizen	0	0.00%
Not a citizen	0	0.00%

Residence in 1995	Number	Percent
Total Population (5 and Over)	388	100.00%
Same house in 1995	269	69.31%
Different house in 1995	119	30.69%
In United States in 1995	119	100.00%
Same County	39	32.72%
Different county	80	67.28%
Different county; Same state	75	63.26%
Different state	5	4.03%
Different state; Northeast	0	0.00%
Different state; Midwest	0	0.00%
Different state; South	5	100.00%
Different state; West	0	0.00%
Elsewhere	0	0.00%

Economics and Employment – 150

Median Family Income, 1999	$41,302
Median Household Income, 1999	$35,773
Median Per Capita Income, 1999	$16,839

Employment Status	Number	Percent
Population (16 and over)	337	100.00%
In labor force	178	52.76%
In Armed Forces	2	0.90%
Civilian	176	99.10%
Civilian; Employed	160	91.14%
Civilian; Unemployed	16	8.86%
Not in labor force	159	47.24%

Place of Work	Number	Percent
Workers (16 and over)	159	100.00%
Worked in Alabama	157	98.99%
In county of residence	44	27.90%
Outside county of residence	113	72.10%
Worked outside Alabama	2	1.01%

Transportation To Work	Number	Percent
Workers (16 and Over)	159	100.00%
Car; truck; or van	154	97.10%
Drove alone	136	88.31%
Carpooled	18	11.69%
Public transportation	0	0.00%
Motorcycle	0	0.00%
Bicycle	0	0.00%
Walked	3	2.02%
Other means	0	0.00%
Worked at home	1	0.88%

Travel Time to Work	Number	Percent
Total Workers (16 and over)	159	100.00%
Did Not Work at Home	157	99.12%
Less than 5 minutes	3	2.04%
5 to 9 minutes	5	3.31%
10 to 14 minutes	8	5.22%
15 to 19 minutes	22	14.12%
20 to 24 minutes	36	22.65%
25 to 29 minutes	9	5.47%
30 to 34 minutes	38	23.92%
35 to 39 minutes	6	3.82%
40 to 44 minutes	3	1.91%
45 to 59 minutes	10	6.11%
60 to 89 minutes	10	6.23%
90 or more minutes	8	5.22%
Worked at Home	1	0.88%

Employment By Industry	Number	Percent
Employed, 16 and Over	160	100.00%
Agri; Forestry; Fish/Hunt	3	2.12%
Mining	3	2.00%
Construction	13	8.23%
Manufacturing	38	23.82%
Wholesale Trade	6	3.62%
Retail Trade	21	13.22%
Transportation/Warehousing	6	3.99%
Utilities	4	2.24%
Information	0	0.00%
Finance and Insurance	4	2.49%
Real Estate	1	0.62%
Prof; Scientific; Tech Svcs	6	3.87%
Mgmt of Companies/Ent	0	0.00%
Admin; Waste Mgmt Svcs	2	1.25%
Educational Services	16	9.98%
Health Care/Social Assist.	12	7.36%
Arts; Entertainment; Rec	0	0.00%
Accommodation/Food Svcs	9	5.49%
Public Administration	11	6.86%
Other Services	5	2.87%

Housing – 150

Median Year Structure Built		1976

Housing	Number	Percent
Total Housing Units	277	100.00%
Urban	0	0.00%
Rural	277	100.00%

Housing Occupancy	Number	Percent
Total	277	100.00%
Occupied	170	61.49%
Owner Occupied	156	91.89%
Renter Occupied	14	8.11%
Vacant	107	38.51%
For Rent	1	1.13%
For Sale Only	1	1.31%
Rented or Sold;	0	0.00%
For Seasonal Use	81	76.17%
For Migrant Workers	0	0.00%
Other vacant	23	21.39%

Household Size	Number	Percent
Total Occupied Housing Units	170	100.00%
1-person household	38	22.56%
2-person household	75	44.07%
3-person household	21	12.34%
4-person household	23	13.51%
5-person household	3	2.00%
6-person household	5	2.82%
7-or-more-person household	5	2.70%

Average Household Size	# Persons
All Housing Units	2.43
Owner occupied	2.51
Renter occupied	1.34

Units & Rooms in Structure	Number	Percent
Housing units: Total	277	100.00%
1 Unit - Detached	178	64.38%
1 Unit - Attached	3	0.94%
2 units in structure	0	0.00%
3 or 4 units in structure	0	0.00%
5 to 9 units in structure	0	0.00%
10 to 19 units in structure	0	0.00%
20 to 49 units in structure	0	0.00%
50 or more units in structure	0	0.00%
Mobile home	96	34.68%
Boat; RV; van; etc.	0	0.00%
Median number of rooms		5.15

House Heating Fuel	Number	Percent
Total Occupied Housing Units	170	100.00%
Utility gas	6	3.53%
Bottled; tank; or LP gas	101	59.58%
Electricity	55	32.20%
Fuel oil; kerosene; etc.	0	0.00%
Coal or coke	0	0.00%
Wood	8	4.70%
Solar energy	0	0.00%
Other fuel	0	0.00%
No fuel used	0	0.00%

Telephone Service	Number	Percent
Total Occupied Housing Units	170	100.00%
Telephone Service Available	168	98.71%
No Telephone Service Available	2	1.29%

Vehicles Available	Number	Percent
Total Occupied Housing Units	170	100.00%
No vehicle available	8	4.70%
1 vehicle available	28	16.69%
2 vehicles available	77	45.24%
3 vehicles available	44	25.73%
4 vehicles available	8	4.94%
5 or more vehicles available	5	2.70%

Plumbing Facilities	Number	Percent
Total Housing Units	277	100.00%
Complete plumbing facilities	275	99.42%
Lacking complete plumbing facilities	2	0.58%

Kitchen Facilities	Number	Percent
Total Housing Units	277	100.00%
Complete kitchen facilities	270	97.62%
Lacking complete kitchen facilities	7	2.38%

Rating and Issues – 150

Criteria	Rating
Impaired Water Bodies	5
ADEM Basin Assessment Rating for NPS Potential	1
NRCS Priority Watershed	1
AWW Water Quality Monitoring and Results	3
Use Classification	5
Land Use Character	1
Potential for Silviculture	5
Sediment Loads	1
Animal Density	1
Soil Suitability for Development	5
Growth Rate of County	2
Increase in Traffic Volume	1
Number of Permitted Dischargers	1
Presence of Hydroelectric Dam	5
Housing Density	1
Septic System Density	4
Number of Endangered Species	4
2000 Unemployment Rate	5
Total	**51 Moderate**

With a rating score of 51, the Lower Hatchet Creek watershed is considered to be a moderate priority watershed in the Lower Coosa River Basin. For more information on the watershed rating and ranking system, refer to the *Lower Coosa River Basin Management Plan*, Part IV, Chapter 12: Priority Watersheds.

A total of 23 issues were identified in the Lower Coosa River Basin. Of these, 11 are present in the Lower Hatchet Creek watershed, of which five are basinwide issues and six are regional issues. The focus of the regional watershed management measures for this watershed is mitigating stormwater runoff, water quality improvement and protection of aquatic habitat.

Refer to the Lower Coosa River Basin Management Plan, Part IV, Chapter 14: Water Quality Improvement Strategy for management measures that may be implemented in this watershed.

Basinwide Issues:

- Endangered Species
- Lack of Water Quality Trend Data
- Illegal Dumping
- Lack of Education and Awareness
- FERC Relicensing of Hydroelectric Facilities

Regional Issues:

- Compliance with the *Recovery Plan for the Mobile River Basin Aquatic Ecosystem*
- Designation as a Critical Habitat
- Sivliculture Runoff
- Nutrients, Algae and Invasive Species
- Low Dissolved Oxygen
- Temperature and Thermal Stress

Walnut Creek Watershed

HUC: 03150107-160

Watershed Area:	112,675 ac.
Percent of Basin:	9.01%
Type:	Agricultural
County-Headwaters:	Chilton
County-Mouth:	Chilton
Municipalities:	Clanton Jemison Thorsby
Total Population:	11,114
Percent of Basin:	10.13%

Land Use

Lakes and Ponds	150 ac
Cropland	7,594 ac
Pastureland	14,338 ac
Forestland	85,361 ac
Urbanized	3,500 ac
Mined Land	0 ac
Other Land	1,732 ac

Animal Data

Cattle	7,700
Dairy	0
Swine	0
Broilers	0
Layers	0
Catfish Acres	20

Domestic Water Data

Septic Tanks	750
Failing Septic Tanks	300
Alternative Systems	0

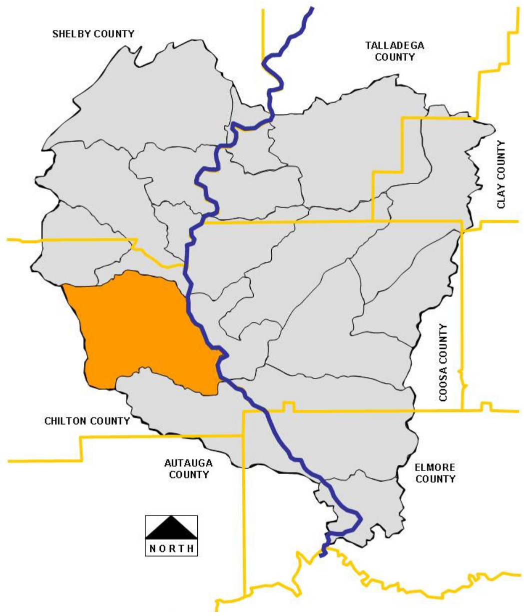
Sediment Loads (in tons)

Total	226,238
Cropland	27,338
Sand & Gravel Pits	22,750
Mined Land	0
Developing Urban Land	24,000
Gullies	29,400
Critical Areas	6,750
Streambanks	17,000
Dirt Roads and Banks	45,000
Woodland	54,000

Water Users

Public Water Supply	1
Total Permitted Dischargers	27
Municipal	2
Industrial	25
Mining	0

Walnut Creek Watershed Location Map



Impaired Water Bodies .... Lay Lake

Active Water Quality Monitoring Sites 7

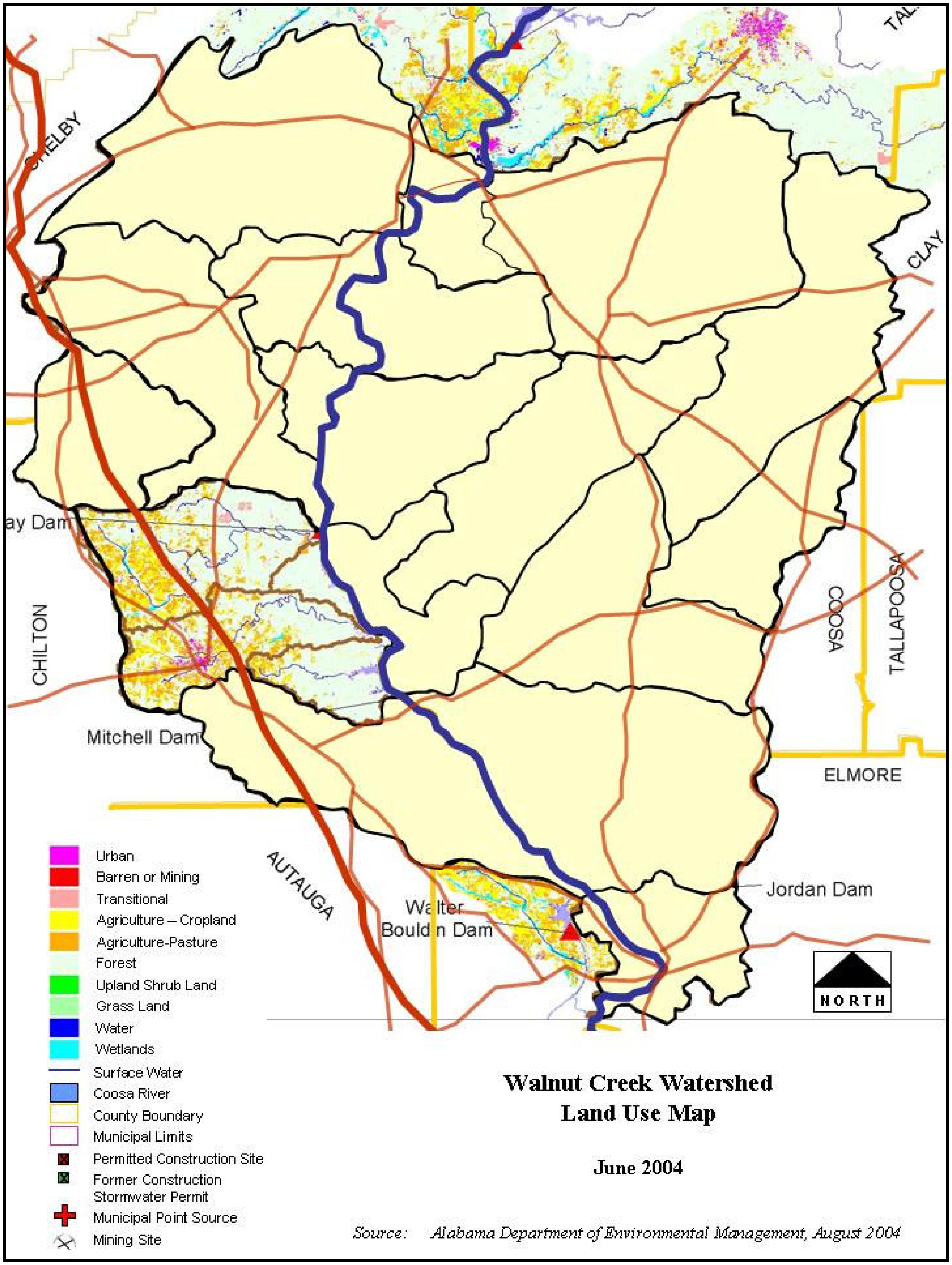
Suitability for Development .... Moderate

2005 Priority Watershed Rating .... High

Major Contributing Factors

- Impaired Waterbodies
- NRCS Priority Watershed
- Alabama Water Watch Water Quality Monitoring and Results
- Animal Density
- Presence of a Hydroelectric Dam
- Housing Density
- Septic System Density
- Number of Permitted Dischargers
- Number of Endangered Species

Land Use – 160



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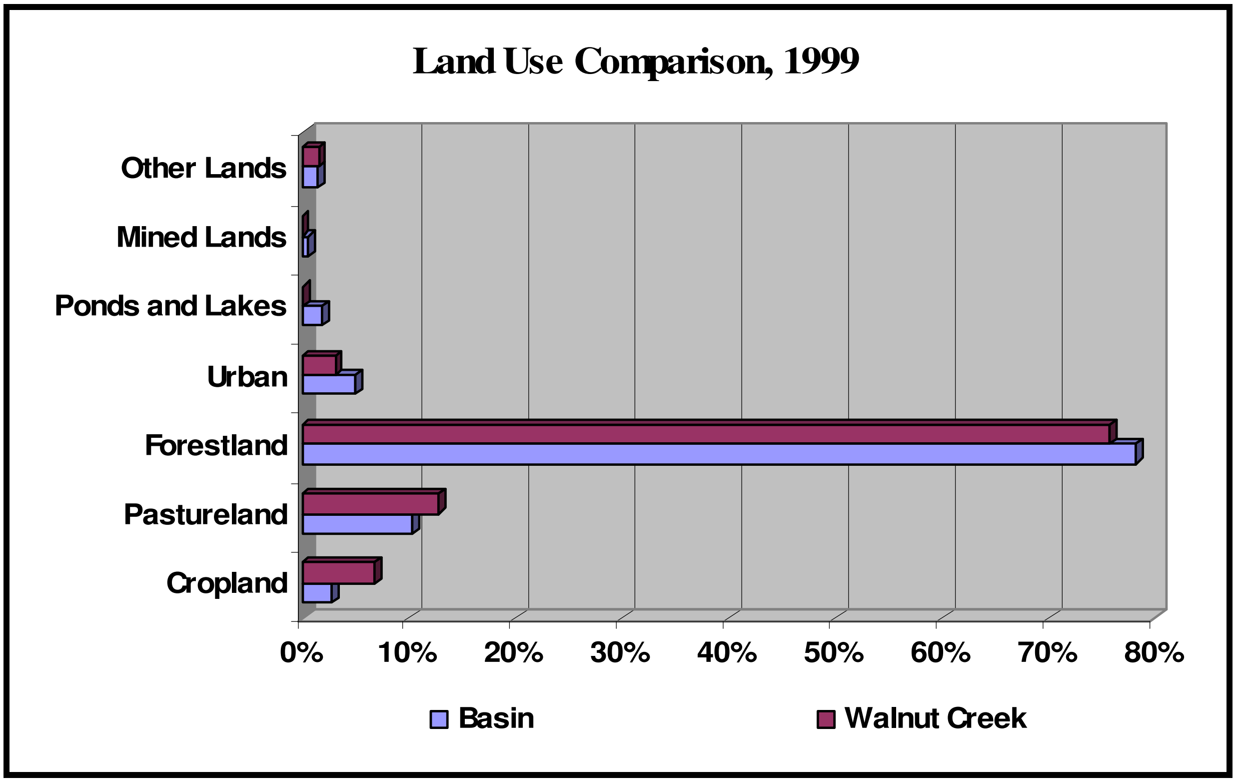
TALLAPOOSA
Mitchell Dam
ELMORE
AUTAUGA
Walter Bouldin Dam
Jordan Dam
NORTH
Urban
Barren or Mining
Transitional
Agriculture – Cropland
Agriculture-Pasture
Forest
Upland Shrub Land
Grass Land
Water
Wetlands
Surface Water
Coosa River
County Boundary
Municipal Limits
Permitted Construction Site
Former Construction Stormwater Permit
Municipal Point Source
Mining Site
Walnut Creek Watershed
Land Use Map
June 2004
Source: Alabama Department of Environmental Management, August 2004



Land Use Patterns

The Walnut Creek watershed has an agricultural character, with 20 percent of the land in agricultural land uses, as compared with 13 percent agricultural land in the basin. Of the agricultural land in the watershed, 13 percent is pasture and 7 percent is crop land. There are approximately 7,700 head of cattle, which is more than any other watershed, along with 20 acres of catfish farms. The watershed is evenly split with agricultural land uses, interspersed with urban land uses, covering the western half of the watershed and forest land uses covering the eastern half. The amount of land in urban land use is relatively low, at 3 percent. The greatest concentration of urban land uses is located in the southwest corner of the watershed in the Clanton area. The Walnut Creek watershed has the highest percent of failing septic systems, at 40 percent of the estimated 750 septic systems in the watershed. Forest land encompasses 76 percent of the watershed. Of the total forest land, 40.36 percent is deciduous, 20.75 percent is evergreen, and 38.89 percent is mixed forest, which is fairly equivalent to forest composition of the basin overall. Sediment production in the watershed is moderate, at 2.01 tons per acre. Sources of sediment include woodlands, at .48 tons per acre; dirt roads, at .40 tons per acre; gullies, at .26 tons per acre; cropland, at .24 tons per acre; urban lands, at .21 tons per acre; and sand and gravel pits, at .20 tons per acre. The watershed is heavily traveled with four major roads: Interstate 65, U.S. Highway 31, Alabama Highway 22, and Alabama Highway 145. Traffic volume on Interstate 65 increased significantly between 1994 and 2002, with increases ranging between 25.15 percent and 29.71 percent. The traffic volume on Highway 145, however, dropped significantly in the same time period, with a 29.85 percent decrease. Traffic volume on Highway 22 within the watershed remained stable, with neither an increase nor decrease. Traffic volume on Highway 31 was not measured within the watershed boundaries.

Soils and Species – 160

The Walnut Creek watershed is comprised primarily of soils in two soil associations. The western half of the watershed is made up of soils in the Savannah-Ruston-Slough Association and the eastern half is made of soils in the Tallapoosa-Tatum Association. Along the southwestern boundary of the watershed is a small area of soils in the Smithdale-Luverne-Troup Association. The soil suitability and limitations for selected uses are provided in the table below. For a map of the soil associations in the watershed and in the Lower Coosa River Basin, refer to the Soil Association Map on page 9.

Soil Association Number	25	41	43
Soil Association	**Tallapoosa-Tatum**	**Savannah-Rushton-Stough**	**Smithdale-Luverne-Troup**
Dominant Slope, %	6 - 50	0 - 6	10 - 35
Soil Suitability and Major Limitations For:			
Cropland	Poor: slope, drought	Good	Poor: slope
Pastureland	Poor: slope	Good	Fair: slope
Woodland	Good	Good	Good
Soil Limitations For:			
Septic Systems	Severe: slope, depth to rock	Severe: percs slowly	Severe: slope
Local Roads and Streets	Severe: slope	Moderate: low strength	Severe: slope
Small Commercial Buildings	Severe: slope	Moderate: wetness	Severe: slope
Dwellings without Basements	Severe: slope	Moderate: wetness	Severe: slope
Camp Areas	Severe: slope	Slight	Severe: slope
Picnic Areas	Severe: slope	Moderate: slope	Severe: slope
Playgrounds	Severe: slope	Moderate: slope	Severe: slope
Paths and Trails	Severe: slope	Slight	Moderate: slope

The Walnut Creek watershed lies within two Level III Ecoregions. The western half of the watershed is in the Southeastern Plains (Fall Line Hills – Level IV Sub-ecoregion). The eastern half is in the Piedmont (Southern Inner Piedmont Level IV Sub-ecoregion). In addition to the protected species found throughout the Lower Coosa River Basin (listed on page 14), the following protected species are found in the Walnut Creek watershed.

Common Name	Scientific Name	Distribution in Lower Coosa River Basin
Bachman's Sparrow	*Aimophila aestivalis*	Coastal Plain and Piedmont province
Common Ground Dove	*Columbina passerine*	Coastal Plain province, rare above Fall Line
Bald Eagle	*Haliaeetus leucocephalus*	Coastal Plain and Piedmont province
Red-cockaded Woodpecker	*Picoides borealis*	Coastal Plain province
Southeastern Pocket Gopher	*Geomys pinetis*	Coastal Plain province
Meadow Jumping Mouse	*Zapus hudsonius*	Chilton, Coosa and Elmore Counties
Mud Elimia	*Elimia alabamensis*	Shelby, Talladega, Chilton, Coosa Counties
Stocky Pebblesnail	*Somatogyrus crassus*	Main stem in Elmore, Chilton, Coosa County May be extinct.
Hidden Pebblesnail	*Somatogyrus decipiens*	Chilton, Coosa Counties. May be extinct.
Fluted Pebblesnail	*Somatogyrus hendersoni*	Main stem, Coosa, Chilton Counties. May be extinct.
Dwarf Pebblesnail	*Somatogyrus nanus*	Main stem throughout basin. Weogufka Creek, Elmore County
Moon Pebblesnail	*Somatogyrus obtusus*	Chilton-Coosa County shoals
Pygmy Pebblesnail	*Somatogyrus pygmaeus*	Chilton County. May be extinct.
Alabama Canebrake Pitcherplant	*Sarracenia rubra*	Autauga, Chilton, Elmore Counties
Nevius Stonecrop	*Sedum nevii*	Chilton, Coosa, Talladega Counties
Horse-nettle	*Solanum carolinense* var. *hirsutum*	Chilton, Coosa Counties

Population - Urban / Rural	Number	Percent
Total Population	11,114	100.00%
Urban	3,938	35.43%
Rural	7,177	64.57%
Farm	119	1.66%
Nonfarm	7,057	98.34%

Population By Race	Number	Percent
Total Population	11,114	99.86%
White	9,242	83.15%
Black	1,592	14.33%
American Indian / Alaskan	72	0.65%
Asian	17	0.02%
Native Hawaiian / Pacific Isl.	0	0.00%
Some Other Race	112	1.01%
Two or More Races	79	0.71%

Population By Age	Number	Percent
Total Population	11,114	100.00%
Under 18	2,758	24.82%
18 to 29 Years	1,711	15.39%
30 to 49 Years	3,046	27.41%
50 to 64 Years	1,828	16.45%
65 Years and Older	1,772	15.94%

Population in Households	Number	Percent
Total Population	11,114	100.00%
Population In households	10,823	97.38%
In Family Households	9,367	86.55%
In NonFamily Households	1,456	13.45%
In Group Quarters	292	2.62%
Institutionalized	280	95.92%
Noninstitutionalized	12	4.08%

Educational Attainment	Number	Percent
Total Population (25 & Over)	7,443	100.00%
No schooling completed	148	1.99%
Some School, No Diploma	2,504	33.65%
High School Graduate, GED	2,359	31.69%
Some College, No Degree	1,247	16.76%
Associate degree	298	4.01%
Bachelor's degree	522	7.01%
Master's degree	235	3.16%
Professional school degree	95	1.27%
Doctorate degree	35	0.47%

Place of Birth	Number	Percent
Total	11,114	100.00%
Native	11,003	99.00%
Born in Alabama	9,110	82.79%
Born in Northeast	153	1.39%
Born in Midwest	447	4.06%
Born in South	1,072	9.74%
Born in West	178	1.62%
Born outside US	44	0.40%
Foreign Born	111	1.00%
Naturalized citizen	59	52.84%
Not a citizen	52	47.16%

Residence in 1995	Number	Percent
Total Population (5 and Over)	10,420	100.00%
Same house in 1995	6,176	59.27%
Different house in 1995	4,244	40.73%
In United States in 1995	4,188	98.70%
Same County	2,416	57.68%
Different county	1,773	42.32%
Different county; Same state	1,189	28.38%
Different state	584	13.94%
Different state; Northeast	13	2.14%
Different state; Midwest	76	12.98%
Different state; South	308	52.71%
Different state; West	188	32.17%
Elsewhere	55	1.30%

Median Family Income, 1999	$39,979
Median Household Income, 1999	$32,909
Median Per Capita Income, 1999	$15,704

Employment Status	Number	Percent
Population (16 and over)	8,643	100.00%
In labor force	4,788	55.40%
In Armed Forces	16	0.33%
Civilian	4,772	99.67%
Civilian; Employed	4,524	94.80%
Civilian; Unemployed	248	5.20%
Not in labor force	3,855	44.60%

Place of Work	Number	Percent
Workers (16 and over)	4,488	100.00%
Worked in Alabama	4,453	99.22%
In county of residence	2,563	57.56%
Outside county of residence	1,890	42.44%
Worked outside Alabama	35	0.78%

Transportation To Work	Number	Percent
Workers (16 and Over)	4,488	100.00%
Car; truck; or van	4,275	95.25%
Drove alone	3,572	83.55%
Carpooled	703	16.45%
Public transportation	10	0.23%
Motorcycle	0	0.00%
Bicycle	10	0.22%
Walked	58	1.29%
Other means	10	0.23%
Worked at home	125	2.78%

Travel Time to Work	Number	Percent
Total Workers (16 and over)	4,488	100.00%
Did Not Work at Home	4,364	97.22%
Less than 5 minutes	183	4.19%
5 to 9 minutes	442	10.13%
10 to 14 minutes	697	15.96%
15 to 19 minutes	564	12.92%
20 to 24 minutes	381	8.74%
25 to 29 minutes	135	3.10%
30 to 34 minutes	486	11.13%
35 to 39 minutes	112	2.56%
40 to 44 minutes	128	2.93%
45 to 59 minutes	619	14.18%
60 to 89 minutes	453	10.37%
90 or more minutes	165	3.78%
Worked at Home	125	2.78%

Employment By Industry	Number	Percent
Employed, 16 and Over	4,524	100.00%
Agri; Forestry; Fish/Hunt	76	1.69%
Mining	20	0.44%
Construction	523	11.56%
Manufacturing	649	14.35%
Wholesale Trade	137	3.02%
Retail Trade	590	13.04%
Transportation/Warehousing	152	3.35%
Utilities	158	3.48%
Information	131	2.90%
Finance and Insurance	238	5.27%
Real Estate	66	1.45%
Prof; Scientific; Tech Svcs	82	1.81%
Mgmt of Companies/Ent	0	0.00%
Admin; Waste Mgmt Svcs	170	3.75%
Educational Services	417	9.21%
Health Care/Social Assist.	378	8.36%
Arts; Entertainment; Rec	22	0.49%
Accommodation/Food Svcs	289	6.38%
Public Administration	160	3.53%
Other Services	268	5.92%

Housing – 160

Median Year Structure Built	1974

Housing	Number	Percent
Total Housing Units	5,238	100.00%
Urban	1,742	33.26%
Rural	3,495	66.74%

Housing Occupancy	Number	Percent
Total	5,238	100.00%
Occupied	4,417	84.34%
Owner Occupied	3,244	73.45%
Renter Occupied	1,173	26.55%
Vacant	820	15.66%
For Rent	109	13.32%
For Sale Only	59	7.13%
Rented or Sold;	33	4.02%
For Seasonal Use	447	54.52%
For Migrant Workers	0	0.00%
Other vacant	172	21.01%

Household Size	Number	Percent
Total Occupied Housing Units	4,417	100.00%
1-person household	1,162	26.30%
2-person household	1,514	34.27%
3-person household	792	17.92%
4-person household	594	13.45%
5-person household	269	6.08%
6-person household	75	1.69%
7-or-more-person household	13	0.29%

Average Household Size	# Persons
All Housing Units	2.46
Owner occupied	2.49
Renter occupied	2.40

Units & Rooms in Structure	Number	Percent
Housing units: Total	5,238	100.00%
1 Unit - Detached	3,508	66.99%
1 Unit - Attached	77	1.47%
2 units in structure	136	2.60%
3 or 4 units in structure	74	1.42%
5 to 9 units in structure	147	2.81%
10 to 19 units in structure	2	0.04%
20 to 49 units in structure	46	0.88%
50 or more units in structure	9	0.17%
Mobile home	1,211	23.12%
Boat; RV; van; etc.	26	0.50%
Median number of rooms		5.47

House Heating Fuel	Number	Percent
Total Occupied Housing Units	4,417	100.00%
Utility gas	1,084	24.55%
Bottled; tank; or LP gas	1,289	29.18%
Electricity	1,949	44.13%
Fuel oil; kerosene; etc.	28	0.62%
Coal or coke	0	0.00%
Wood	49	1.10%
Solar energy	0	0.00%
Other fuel	3	0.06%
No fuel used	16	0.36%

Telephone Service	Number	Percent
Total Occupied Housing Units	4,417	100.00%
Telephone Service Available	4,241	96.01%
No Telephone Service Available	176	3.99%

Vehicles Available	Number	Percent
Total Occupied Housing Units	4,417	100.00%
No vehicle available	369	8.36%
1 vehicle available	1,341	30.36%
2 vehicles available	1,662	37.63%
3 vehicles available	818	18.51%
4 vehicles available	134	3.04%
5 or more vehicles available	93	2.09%

Plumbing Facilities	Number	Percent
Total Housing Units	5,238	100.00%
Complete plumbing facilities	5,177	98.84%
Lacking complete plumbing facilities	61	1.16%

Kitchen Facilities	Number	Percent
Total Housing Units	5,238	100.00%
Complete kitchen facilities	5,194	99.18%
Lacking complete kitchen facilities	43	0.82%

Rating and Issues – 160

Criteria	Rating
Impaired Water Bodies	5
ADEM Basin Assessment Rating for NPS Potential	1
NRCS Priority Watershed	5
AWW Water Quality Monitoring and Results	5
Use Classification	3
Land Use Character	3
Potential for Silviculture	3
Sediment Loads	2
Animal Density	5
Soil Suitability for Development	3
Growth Rate of County	3
Increase in Traffic Volume	3
Number of Permitted Dischargers	4
Presence of Hydroelectric Dam	5
Housing Density	5
Septic System Density	5
Number of Endangered Species	4
2000 Unemployment Rate	3
Total	**67 High**

With a rating score of 67, the Walnut Creek watershed is considered to be a high priority watershed in the Lower Coosa River Basin. For more information on the watershed rating and ranking system, refer to the *Lower Coosa River Basin Management Plan*, Part IV, Chapter 12: Priority Watersheds.

A total of 23 issues were identified in the Lower Coosa River Basin. Of these, 12 are present in the Walnut Creek watershed, of which five are basinwide issues and seven are regional issues. The focus of the regional watershed management measures for this watershed is managing growth and development pressures, mitigating stormwater runoff and water quality improvement.

Refer to the Lower Coosa River Basin Management Plan, Part IV, Chapter 14: Water Quality Improvement Strategy for management measures that may be implemented in this watershed.

Basinwide Issues:

- Endangered Species
- Lack of Water Quality Trend Data
- Illegal Dumping
- Lack of Education and Awareness
- FERC Relicensing of Hydroelectric Facilities

Regional Issues:

- Growth Rate and Urban Development
- Agricultural Runoff
- Sivliculture Runoff
- Urban Runoff
- Nutrients, Algae and Invasive Species
- Low Dissolved Oxygen
- Temperature and Thermal Stress

Chestnut Creek Watershed
HUC: 03150107-170

Watershed Area:	80,961 ac.
Percent of Basin:	6.47%
Type:	Agricultural/Urban
County-Headwaters:	Chilton
County-Mouth:	Elmore
Municipalities:	Clanton
Total Population:	9,825
Percent of Basin:	8.96%

Land Use	
Lakes and Ponds	2,437 ac
Cropland	6,080 ac
Pastureland	8,670 ac
Forestland	57,369 ac
Urbanized	4,610 ac
Mined Land	0 ac
Other Land	1,795 ac

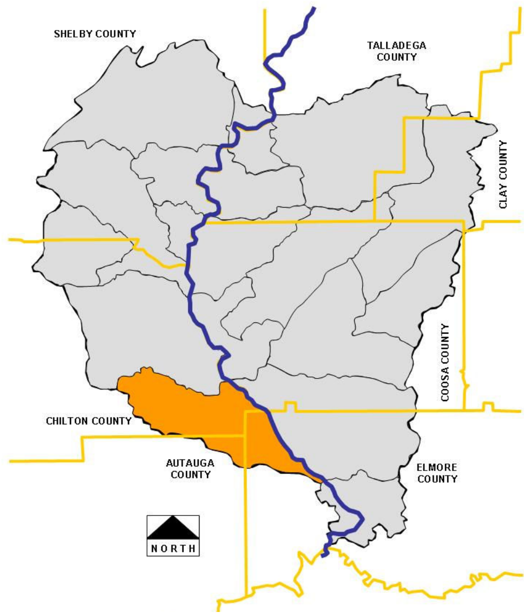
Animal Data	
Cattle	1,305
Dairy	0
Swine	250
Broilers	0
Layers	0
Catfish Acres	6

Domestic Water Data	
Septic Tanks	2,153
Failing Septic Tanks	47
Alternative Systems	0

Sediment Loads (in tons)	
Total	199,057
Cropland	22,125
Sand & Gravel Pits	3,500
Mined Land	0
Developing Urban Land	72,300
Gullies	44,100
Critical Areas	10,875
Streambanks	9,057
Dirt Roads and Banks	24,927
Woodland	12,173

Water Users	
Public Water Supply	0
Total Permitted Dischargers	8
Municipal	1
Industrial	5
Mining	2

Chestnut Creek Watershed
Location Map



Impaired Water Bodies..None

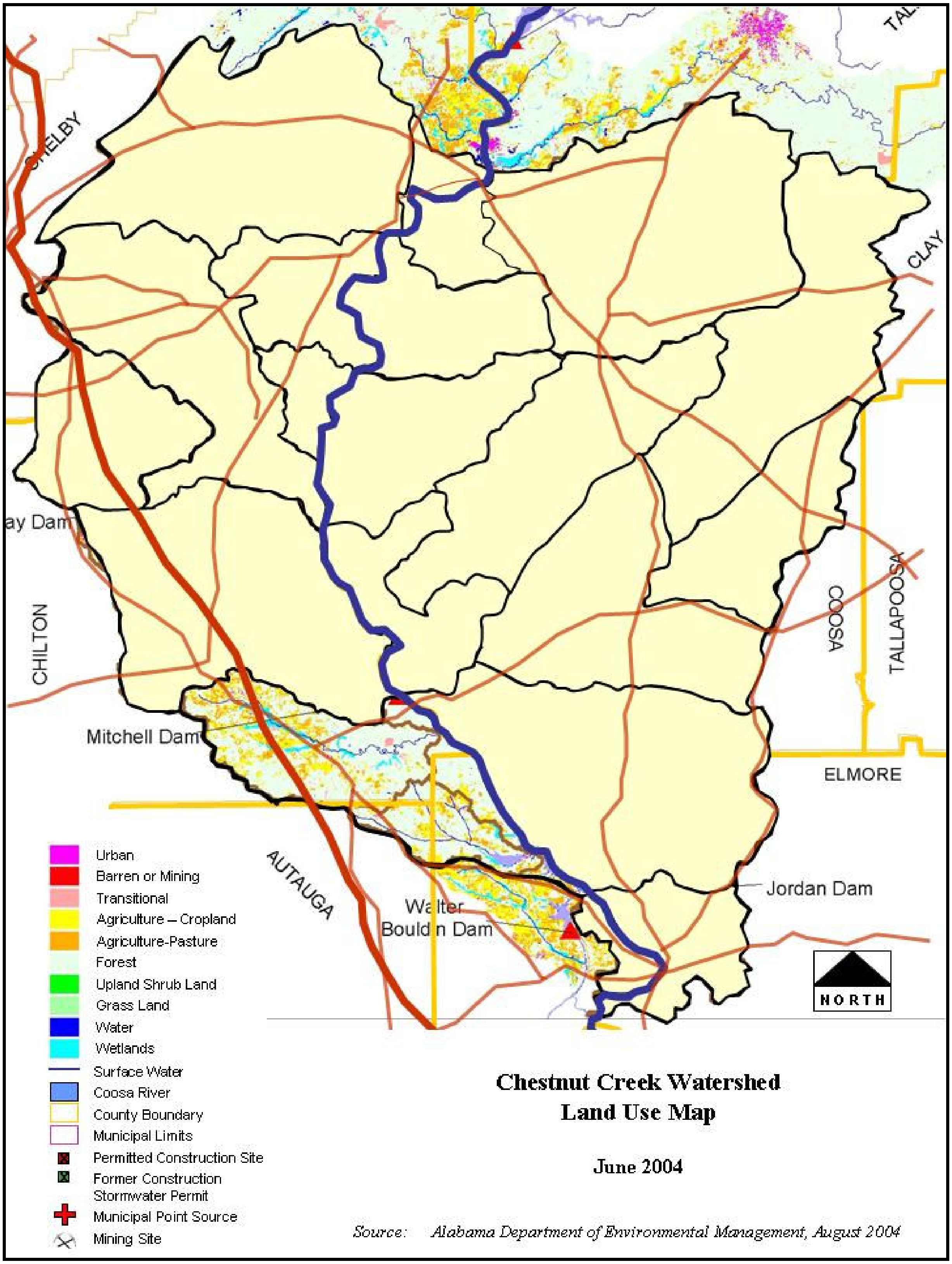
Active Water Quality Monitoring Sites........................2

Suitability for Development...................................Poor

2005 Priority Watershed Rating............................. High

<u>Major Contributing Factors</u>

- Alabama Water Watch Water Quality Monitoring and Results
- Increase in Traffic Volume
- Presence of a Hydroelectric Dam
- Housing Density
- Septic System Density
- Number of Endangered Species
- Land Use Character
- Soil Suitability for Development


TAL
SHELBY
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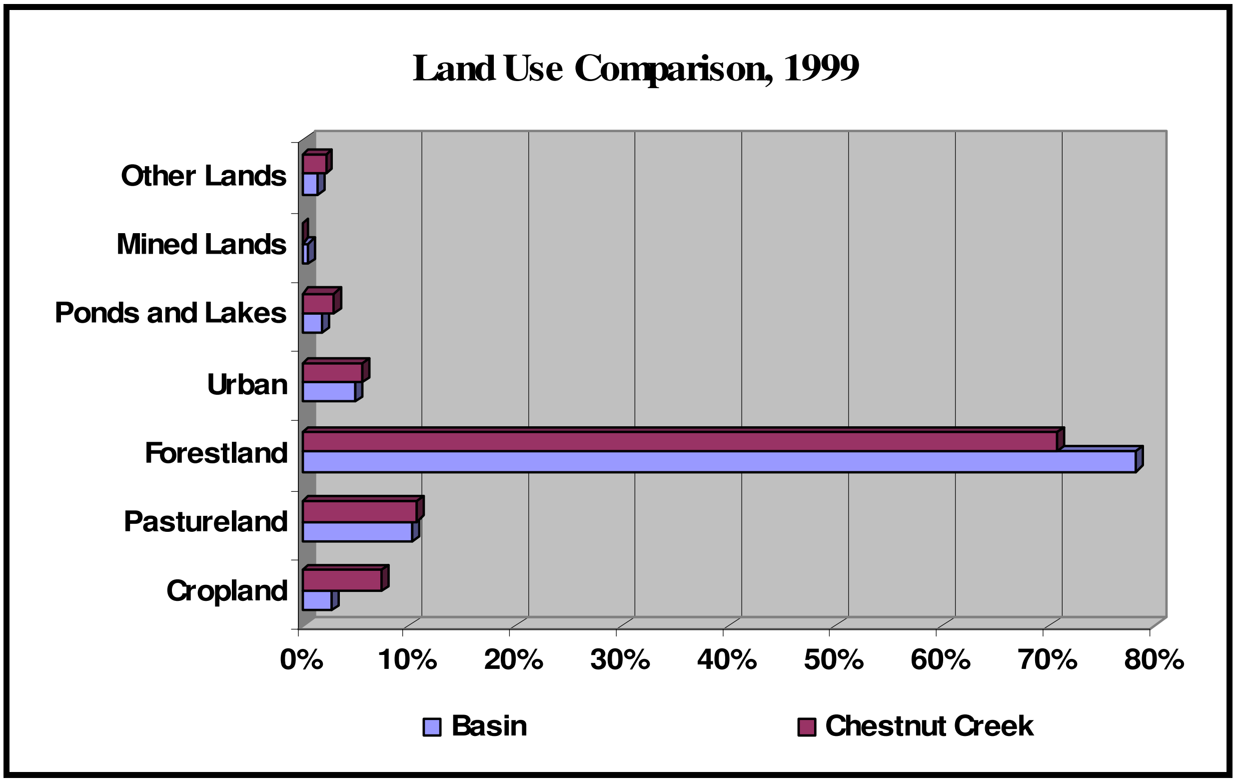
ay Dam
CHILTON
COOSA
TALLAPOOSA
Mitchell Dam
ELMORE
AUTAUGA
Walter
Bouldin Dam
Jordan Dam
NORTH
Urban
Barren or Mining
Transitional
Agriculture – Cropland
Agriculture-Pasture
Forest
Upland Shrub Land
Grass Land
Water
Wetlands
Surface Water
Coosa River
County Boundary
Municipal Limits
Permitted Construction Site
Former Construction Stormwater Permit
Municipal Point Source
Mining Site
Chestnut Creek Watershed
Land Use Map
June 2004
Source: Alabama Department of Environmental Management, August 2004



Land Use Patterns

The Chestnut Creek watershed has a higher percentage of both agricultural land, at 19 percent, and urban land, at 6 percent, than the basin overall, at 13 percent and 5 percent, respectively, giving the watershed a primary agricultural and secondary urban character. Agricultural land uses are primarily located in the northwestern part of the watershed, in the central part of the watershed west of Chestnut Creek, and in the southern part of the watershed. The majority of the agricultural land, at 11 percent of the total land, is pasture while cropland comprises 8 percent of the total land. There are approximately 1,305 head of cattle and 250 swine in the watershed, along with six acres of catfish farming. Urban lands are located in the northwest corner of the watershed in and around Clanton. There are approximately 2,153 septic systems, of which 2.18 percent are estimated to be failing. Forest land, which is concentrated in the east central part of the watershed encompass 71 percent of the total land. The Chestnut Creek watershed has a moderate amount of deciduous forest, at 39.49 percent, while the remaining forest land is comprised of evergreen forest, at 17.80 percent, and mixed forest, at 42.71 percent. The high percentage of mixed and evergreen forest indicates a high potential for active silviculture within the watershed. Sediment production in the watershed is moderate, at 2.46 tons per acre. Major sources of sediment are urban lands, at .89 tons per acre; gullies, at .54 tons per acre; dirt roads, at .31 tons per acre; and cropland, at .27 tons per acre. The Chestnut Creek watershed is accessed by three major roads: Interstate 65, U.S. Highway 31, and Alabama Highway 22. Traffic volume on Interstate 65 increased by 21.75 percent from 1994 to 2002. During the same time period, Highway 31 experienced an even greater increase in traffic at 57.80 percent at a point just south of the intersection with Interstate 65. Alabama Highway 22 experienced a slight increase in traffic volume, 3.42 percent, east of U.S. Highway 231 during the same time period.

Soils and Species – 170

The Chestnut Creek watershed is comprised of soils in three soil associations. Soils in the Smithdale-Troup-Lucedale-Luverne Association are found along the northwestern edge of the watershed. The predominant soil group is the Savannah-Ruston-Slough Association, which encompasses the central part of the watershed. And, soils in the Tallapoosa-Tatum Association are located in the northeast corner. The soil suitability and limitations for selected uses are provided in the table below. For a map of the soil associations in the watershed and in the Lower Coosa River Basin, refer to the Soil Association Map on page 9.

Soil Association Number	25	41	44
Soil Association	**Tallapoosa-Tatum**	**Savannah-Rushton-Stough**	**Smithdale-Troup-Lucedale-Luverne**
Dominant Slope, %	6 - 50	0 - 6	5 - 30
Soil Suitability and Major Limitations For:			
Cropland	Poor: slope, drought	Good	Poor: slope
Pastureland	Poor: slope	Good	Fair: slope
Woodland	Good	Good	Good
Soil Limitations For:			
Septic Systems	Severe: slope, depth to rock	Severe: percs slowly	Severe: slope
Local Roads and Streets	Severe: slope	Moderate: low strength	Severe: slope
Small Commercial Buildings	Severe: slope	Moderate: wetness	Severe: slope
Dwellings without Basements	Severe: slope	Moderate: wetness	Severe: slope
Camp Areas	Severe: slope	Slight	Severe: slope
Picnic Areas	Severe: slope	Moderate: slope	Severe: slope
Playgrounds	Severe: slope	Moderate: slope	Severe: slope
Paths and Trails	Severe: slope	Slight	Moderate: slope

The Chestnut Creek watershed lies within two Level III Ecoregions. The western two-thirds of the watershed is in the Southeastern Plains (Fall Line Hills – Level IV Sub-ecoregion). The northeastern corner is in the Piedmont (Southern Inner Piedmont Level IV Sub-ecoregion). In addition to the protected species found throughout the Lower Coosa River Basin (listed on page 14), the following protected species are found in the Chestnut Creek watershed.

Common Name	Scientific Name	Distribution in Lower Coosa River Basin
Bachman's Sparrow	*Aimophila aestivalis*	Coastal Plain and Piedmont province
Common Ground Dove	*Columbina passerine*	Coastal Plain province, rare above Fall Line
Bald Eagle	*Haliaeetus leucocephalus*	Coastal Plain and Piedmont province
Red-cockaded Woodpecker	*Picoides borealis*	Coastal Plain province
Southeastern Pocket Gopher	*Geomys pinetis*	Coastal Plain province
Meadow Jumping Mouse	*Zapus hudsonius*	Chilton, Coosa and Elmore Counties
Mud Elimia	*Elimia alabamensis*	Shelby, Talladega, Chilton, Coosa Counties
Stocky Pebblesnail	*Somatogyrus crassus*	Main stem in Elmore, Chilton, Coosa Counties. May be extinct.
Hidden Pebblesnail	*Somatogyrus decipiens*	Chilton, Coosa Counties. May be extinct.
Fluted Pebblesnail	*Somatogyrus hendersoni*	Main stem, Coosa, Chilton Counties. May be extinct.
Granite Pebblesnail	*Somatogyrus hinkleyi*	Wetumpka, Elmore County; Wilsonville, Shelby County.
Dwarf Pebblesnail	*Somatogyrus nanus*	Main stem throughout basin. Weogufka Creek, Elmore County.
Moon Pebblesnail	*Somatogyrus obtusus*	Chilton-Coosa County shoals
Pygmy Pebblesnail	*Somatogyrus pygmaeus*	Chilton County. May be extinct.
Price's Potatoe-bean	*Apios priceana*	Autauga County
Georgia Rock-cress	*Arabis Georgiana*	Elmore County
Pinnate-lobed Coneflower	*Rudbeckia triloba*	Autauga County
AL Canebrake Pitcherplant	*Sarracenia rubra*	Autauga, Chilton, Elmore Counties
Nevius Stonecrop	*Sedum nevii*	Chilton, Coosa, Talladega Counties
Horse-nettle	*Solanum carolinense* var. *hirsutum*	Chilton, Coosa Counties
Pickering Morning-glory	*Stylisma pickeringii*	Autauga County
Roundleaf Meadowrue	*Thalictrum subrotundum*	Autauga, Clay Counties

Population - Urban / Rural	Number	Percent
Total Population	9,825	100.00%
Urban	795	8.09%
Rural	9,030	91.91%
Farm	182	2.02%
Nonfarm	8,847	97.98%

Population By Race	Number	Percent
Total Population	9,825	99.78%
White	8,395	85.44%
Black	1,265	12.88%
American Indian / Alaskan	33	0.33%
Asian	24	0.02%
Native Hawaiian / Pacific Isl.	0	0.00%
Some Other Race	24	0.25%
Two or More Races	84	0.86%

Population By Age	Number	Percent
Total Population	9,825	100.00%
Under 18	2,508	25.53%
18 to 29 Years	1,449	14.75%
30 to 49 Years	2,844	28.95%
50 to 64 Years	1,781	18.12%
65 Years and Older	1,243	12.65%

Population in Households	Number	Percent
Total Population	9,825	100.00%
Population In households	9,641	98.13%
In Family Households	8,583	89.02%
In NonFamily Households	1,059	10.98%
In Group Quarters	184	1.87%
Institutionalized	177	96.15%
Noninstitutionalized	7	3.85%

Educational Attainment	Number	Percent
Total Population (25 & Over)	6,527	100.00%
No schooling completed	72	1.10%
Some School, No Diploma	1,841	28.20%
High School Graduate, GED	2,425	37.15%
Some College, No Degree	1,173	17.97%
Associate degree	293	4.48%
Bachelor's degree	474	7.26%
Master's degree	195	2.99%
Professional school degree	40	0.61%
Doctorate degree	15	0.23%

Place of Birth	Number	Percent
Total	9,825	100.00%
Native	9,763	99.37%
Born in Alabama	7,896	80.87%
Born in Northeast	155	1.59%
Born in Midwest	295	3.02%
Born in South	1,244	12.74%
Born in West	91	0.93%
Born outside US	83	0.85%
Foreign Born	62	0.63%
Naturalized citizen	35	55.94%
Not a citizen	27	44.06%

Residence in 1995	Number	Percent
Total Population (5 and Over)	9,156	100.00%
Same house in 1995	5,668	61.90%
Different house in 1995	3,488	38.10%
In United States in 1995	3,451	98.96%
Same County	1,770	51.28%
Different county	1,682	48.72%
Different county; Same state	1,169	33.86%
Different state	513	14.87%
Different state; Northeast	38	7.40%
Different state; Midwest	33	6.45%
Different state; South	368	71.80%
Different state; West	74	14.35%
Elsewhere	27	0.79%

Economics and Employment – 170

Median Family Income, 1999	$40,573
Median Household Income, 1999	$35,196
Median Per Capita Income, 1999	$15,488

Employment Status	Number	Percent
Population (16 and over)	7,606	100.00%
In labor force	4,652	61.16%
In Armed Forces	12	0.26%
Civilian	4,640	99.74%
Civilian; Employed	4,401	94.85%
Civilian; Unemployed	239	5.15%
Not in labor force	2,955	38.84%

Place of Work	Number	Percent
Workers (16 and over)	4,336	100.00%
Worked in Alabama	4,289	98.92%
In county of residence	2,098	48.92%
Outside county of residence	2,191	51.08%
Worked outside Alabama	47	1.08%

Transportation To Work	Number	Percent
Workers (16 and Over)	4,336	100.00%
Car; truck; or van	4,150	95.71%
Drove alone	3,424	82.52%
Carpooled	726	17.48%
Public transportation	0	0.00%
Motorcycle	0	0.00%
Bicycle	0	0.00%
Walked	26	0.61%
Other means	26	0.60%
Worked at home	134	3.09%

Travel Time to Work	Number	Percent
Total Workers (16 and over)	4,336	100.00%
Did Not Work at Home	4,202	96.91%
Less than 5 minutes	103	2.44%
5 to 9 minutes	262	6.23%
10 to 14 minutes	470	11.19%
15 to 19 minutes	428	10.18%
20 to 24 minutes	412	9.80%
25 to 29 minutes	203	4.83%
30 to 34 minutes	658	15.65%
35 to 39 minutes	222	5.29%
40 to 44 minutes	298	7.08%
45 to 59 minutes	690	16.41%
60 to 89 minutes	320	7.63%
90 or more minutes	138	3.28%
Worked at Home	134	3.09%

Employment By Industry	Number	Percent
Employed, 16 and Over	4,401	100.00%
Agri; Forestry; Fish/Hunt	96	2.19%
Mining	17	0.39%
Construction	564	12.81%
Manufacturing	678	15.40%
Wholesale Trade	151	3.43%
Retail Trade	649	14.75%
Transportation/Warehousing	212	4.81%
Utilities	120	2.73%
Information	52	1.18%
Finance and Insurance	167	3.79%
Real Estate	37	0.84%
Prof; Scientific; Tech Svcs	92	2.08%
Mgmt of Companies/Ent	0	0.00%
Admin; Waste Mgmt Svcs	121	2.75%
Educational Services	274	6.22%
Health Care/Social Assist.	363	8.25%
Arts; Entertainment; Rec	40	0.90%
Accommodation/Food Svcs	195	4.43%
Public Administration	300	6.83%
Other Services	274	6.22%

Median Year Structure Built	1977

Housing	Number	Percent
Total Housing Units	4,468	100.00%
Urban	349	7.80%
Rural	4,119	92.20%

Housing Occupancy	Number	Percent
Total	4,468	100.00%
Occupied	3,770	84.39%
Owner Occupied	3,224	85.52%
Renter Occupied	546	14.48%
Vacant	698	15.61%
For Rent	16	2.27%
For Sale Only	78	11.17%
Rented or Sold;	67	9.64%
For Seasonal Use	297	42.57%
For Migrant Workers	3	0.36%
Other vacant	237	34.01%

Household Size	Number	Percent
Total Occupied Housing Units	3,770	100.00%
1-person household	807	21.41%
2-person household	1,341	35.56%
3-person household	760	20.16%
4-person household	527	13.98%
5-person household	230	6.09%
6-person household	58	1.54%
7-or-more-person household	47	1.25%

Average Household Size	# Persons
All Housing Units	2.57
Owner occupied	2.63
Renter occupied	2.27

Units & Rooms in Structure	Number	Percent
Housing units: Total	4,468	100.00%
1 Unit - Detached	3,097	69.32%
1 Unit - Attached	30	0.67%
2 units in structure	21	0.47%
3 or 4 units in structure	0	0.00%
5 to 9 units in structure	10	0.22%
10 to 19 units in structure	3	0.07%
20 to 49 units in structure	0	0.00%
50 or more units in structure	0	0.00%
Mobile home	1,274	28.51%
Boat; RV; van; etc.	33	0.73%
Median number of rooms		5.53

House Heating Fuel	Number	Percent
Total Occupied Housing Units	3,770	100.00%
Utility gas	377	9.99%
Bottled; tank; or LP gas	1,718	45.56%
Electricity	1,570	41.65%
Fuel oil; kerosene; etc.	11	0.28%
Coal or coke	0	0.00%
Wood	65	1.73%
Solar energy	0	0.00%
Other fuel	19	0.51%
No fuel used	10	0.27%

Telephone Service	Number	Percent
Total Occupied Housing Units	3,770	100.00%
Telephone Service Available	3,635	96.43%
No Telephone Service Available	135	3.57%

Vehicles Available	Number	Percent
Total Occupied Housing Units	3,770	100.00%
No vehicle available	269	7.13%
1 vehicle available	916	24.30%
2 vehicles available	1,460	38.72%
3 vehicles available	760	20.16%
4 vehicles available	238	6.31%
5 or more vehicles available	128	3.38%

Plumbing Facilities	Number	Percent
Total Housing Units	4,468	100.00%
Complete plumbing facilities	4,372	97.87%
Lacking complete plumbing facilities	95	2.13%

Kitchen Facilities	Number	Percent
Total Housing Units	4,468	100.00%
Complete kitchen facilities	4,380	98.05%
Lacking complete kitchen facilities	87	1.95%

Rating and Issues – 170

Criteria	Rating
Impaired Water Bodies	1
ADEM Basin Assessment Rating for NPS Potential	1
NRCS Priority Watershed	3
AWW Water Quality Monitoring and Results	5
Use Classification	3
Land Use Character	4
Potential for Silviculture	3
Sediment Loads	2
Animal Density	2
Soil Suitability for Development	4
Growth Rate of County	3
Increase in Traffic Volume	5
Number of Permitted Dischargers	2
Presence of Hydroelectric Dam	5
Housing Density	5
Septic System Density	5
Number of Endangered Species	5
2000 Unemployment Rate	3
Total	**61 High**

With a rating score of 61, the Chestnut Creek watershed is considered to be a high priority watershed in the Lower Coosa River Basin. For more information on the watershed rating and ranking system, refer to the *Lower Coosa River Basin Management Plan*, Part IV, Chapter 12: Priority Watersheds.

A total of 23 issues were identified in the Lower Coosa River Basin. Of these, 11 are present in the Chestnut Creek watershed, of which five are basinwide issues and six are regional issues. The focus of the regional watershed management measures for this watershed is managing growth and development pressures, mitigating stormwater runoff and water quality improvement.

Refer to the Lower Coosa River Basin Management Plan, Part IV, Chapter 14: Water Quality Improvement Strategy for management measures that may be implemented in this watershed.

Basinwide Issues:
- Endangered Species
- Lack of Water Quality Trend Data
- Illegal Dumping
- Lack of Education and Awareness
- FERC Relicensing of Hydroelectric Facilities

Regional Issues:
- Growth Rate and Urban Development
- Agricultural Runoff
- Urban Runoff
- Nutrients, Algae and Invasive Species
- Low Dissolved Oxygen
- Temperature and Thermal Stress

Weoka Creek Watershed
HUC: 03150107-180

Watershed Area:	121,204 ac.
Percent of Basin:	9.69%
Type:	Forest
County-Headwaters:	Coosa
County-Mouth:	Elmore
Municipalities:	None
Total Population:	6,110
Percent of Basin:	5.57%

Land Use

Lakes and Ponds	1,840 ac
Cropland	1,519 ac
Pastureland	11,252 ac
Forestland	101,839 ac
Urbanized	4,205 ac
Mined Land	2 ac
Other Land	547 ac

Animal Data

Cattle	1,430
Dairy	9
Swine	0
Broilers	0
Layers	0
Catfish Acres	70

Domestic Water Data

Septic Tanks	1,572
Failing Septic Tanks	34
Alternative Systems	0

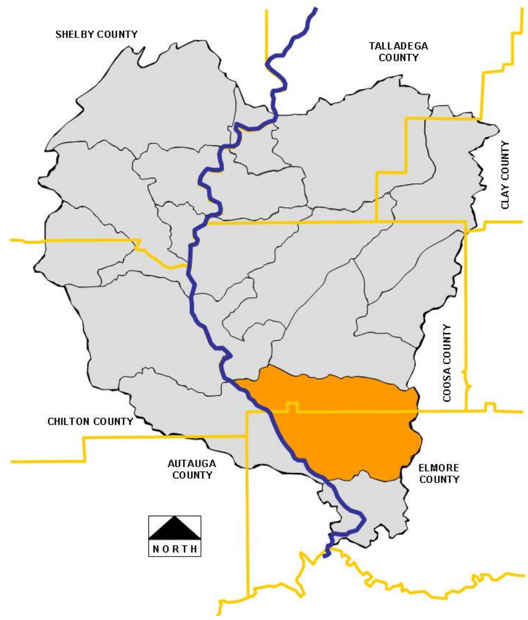
Sediment Loads (in tons)

Total	145,212
Cropland	7,748
Sand & Gravel Pits	0
Mined Land	30
Developing Urban Land	30,000
Gullies	2,520
Critical Areas	40,000
Streambanks	21,270
Dirt Roads and Banks	2,606
Woodland	40,588

Water Users

Public Water Supply	0
Total Permitted Dischargers	5
Municipal	0
Industrial	4
Mining	1

Weoka Creek Watershed Location Map



Impaired Water Bodies...None

Active Water Quality Monitoring Sites........................4

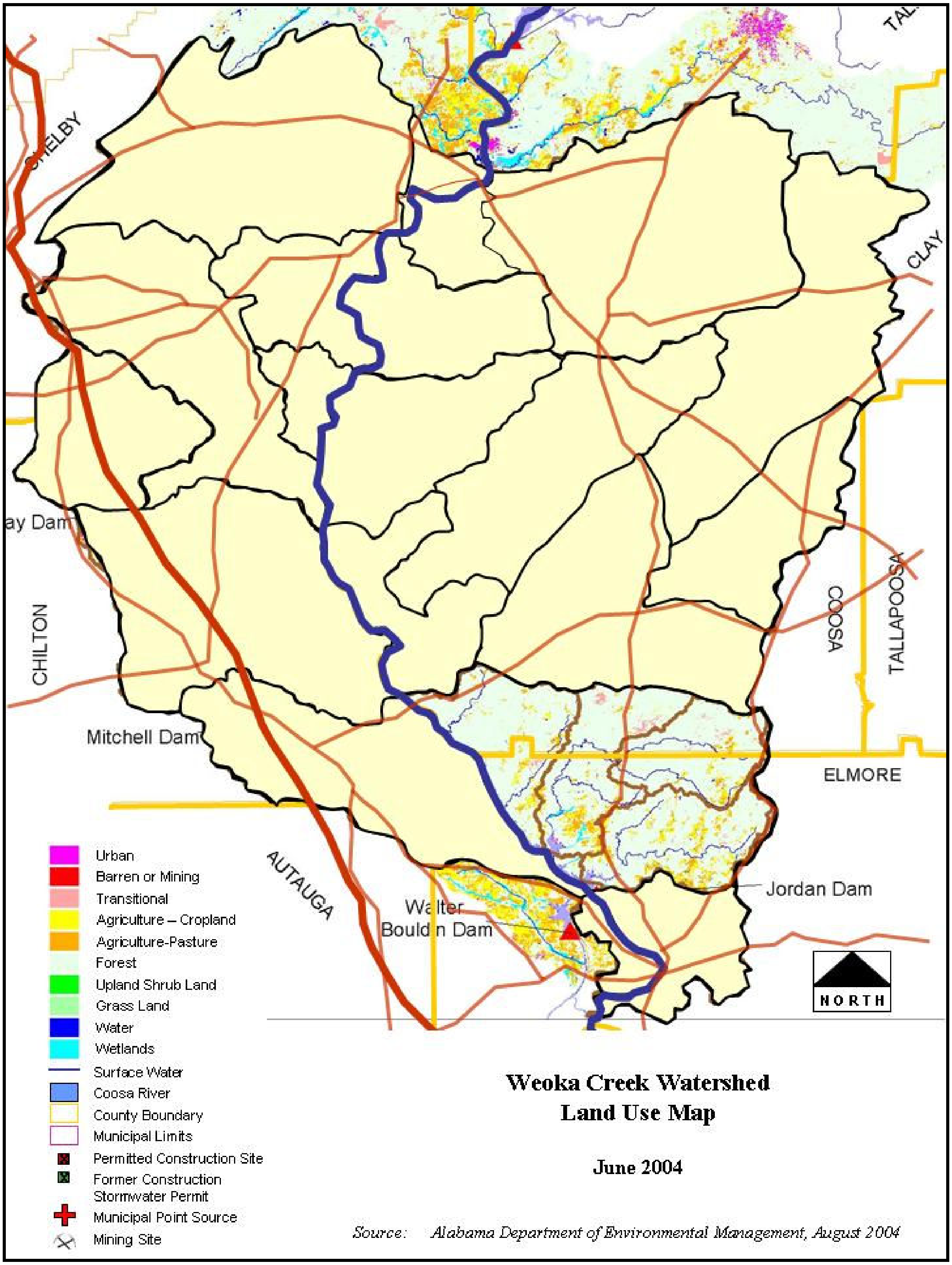
Suitability for Development............................Moderate

2005 Priority Watershed Rating..............................Low

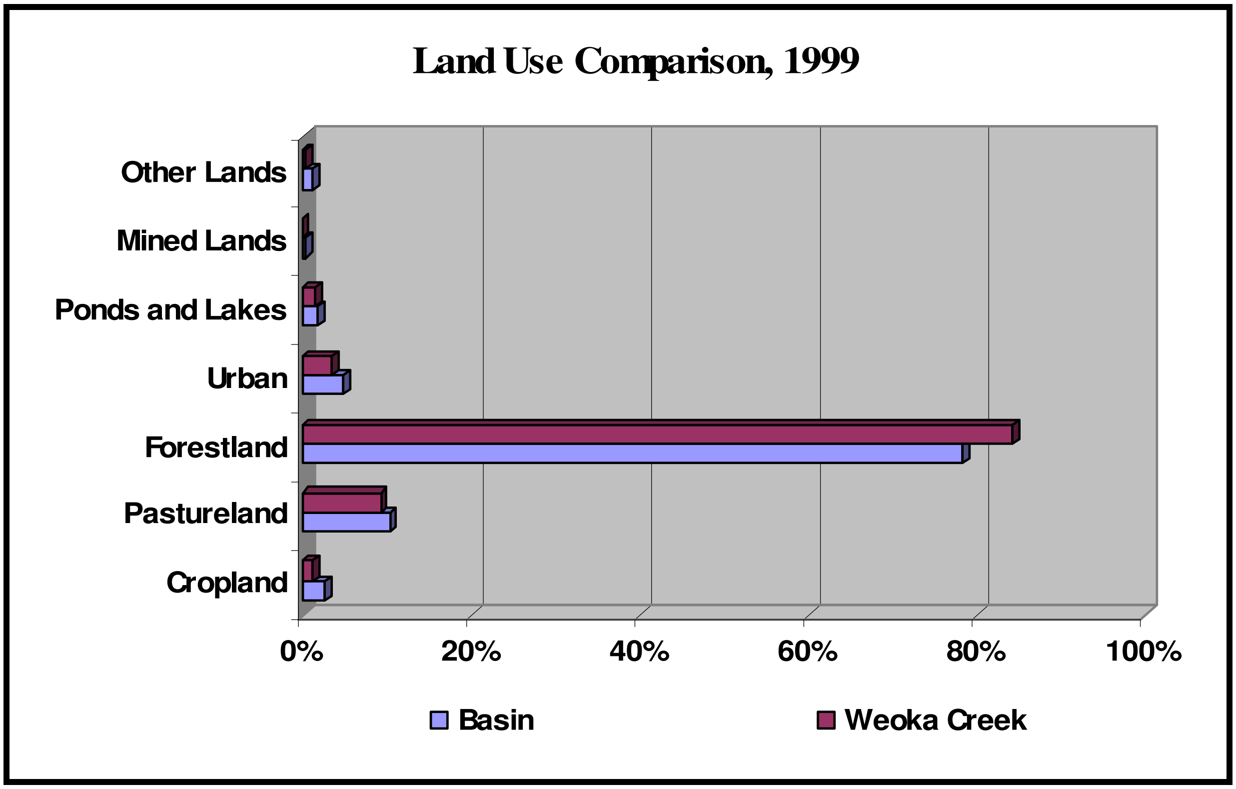
Major Contributing Factors

- Use Classification
- Presence of a Hydroelectric Dam
- Septic System Density
- Growth Rate of County
- Housing Density
- Number of Endangered Species

Land Use – 180



SHELBY
TAL
CLAY
ay Dam
CHILTON
Mitchell Dam
COOSA
TALLAPOOSA
ELMORE
AUTAUGA
Walter Bouldin Dam
Jordan Dam
NORTH
Urban
Barren or Mining
Transitional
Agriculture – Cropland
Agriculture-Pasture
Forest
Upland Shrub Land
Grass Land
Water
Wetlands
Surface Water
Coosa River
County Boundary
Municipal Limits
Permitted Construction Site
Former Construction Stormwater Permit
Municipal Point Source
Mining Site
Weoka Creek Watershed
Land Use Map
June 2004
Source: Alabama Department of Environmental Management, August 2004



Land Use Patterns

Overall, the Weoka Creek watershed has forest character, with 84 percent of the land in forested land uses, as compared with 78 percent of the total land in the basin. Of the total forest land, 41.59 percent is deciduous forest, 19.39 percent is evergreen forest, and 39.02 percent is mixed forest. The high percentage of mixed and evergreen forest indicates a high potential for active silviculture within the watershed. Forest land uses are located throughout the watershed. Agricultural land uses, which comprise 10 percent of the watershed, are primarily concentrated in the southern part of the watershed in Elmore County. Most of the agricultural land is used for pasture. There are approximately 1,430 head of cattle and 70 acres of catfish farms in the watershed. Urban land uses, which comprise 3 percent of the watershed, are located sporadically throughout the watershed, most of which are transitional lands centered around crossroads.

There are approximately 1,572 septic systems in the watershed, of which 2.16 percent are estimated to be failing. The density of septic systems is moderate at one system per 77.10 acres. Sediment production in the watershed is comparatively low, at 1.20 tons per acre. Major sources of sediment are woodlands and critical areas, with each producing approximately .33 tons of sediment per acre, followed by developing urban lands, at .25 tons of sediment per acre.

Two major roads are located in the watershed: U.S. Highway 231 and Alabama Highway 22. Highway 231, which runs north-south through the central part of the watershed, experienced moderate increases in traffic volume between 1994 and 2002, ranging from a 4.92 percent increase to a 12.13 percent increase. Traffic volume on Highway 22, which runs east-west in the northwester part of the watershed, increased 15.97 percent in the same time period.

Soils and Species – 180

The Weoka Creek watershed is comprised of soils in three soil associations. In the northwestern corner of the watershed are soils in the Tallapoosa-Tatum Association. The predominant soil group is the Cecil-Grover-Madison Association, which encompasses almost all of the central, eastern and southern parts of the watershed. The exception is two small areas of soils from the Lucedale-Bama Association in the southwestern part of the watershed. The soil suitability and limitations for selected uses are provided in the table below. For a map of the soil associations in the watershed and in the Lower Coosa River Basin, refer to the Soil Association Map on page 9.

Soil Association Number	**18**	**25**	**39**
Soil Association	**Cecil-Grover-Madison**	**Tallapoosa-Tatum**	**Lucedale-Bama**
Dominant Slope, %	2 - 25	6 – 50	0 - 5
Soil Suitability and Major Limitations For:			
Cropland	Poor: slope	Poor: slope, droughty	Good
Pastureland	Good	Poor: slope	Good
Woodland	Good	Good	Good
Soil Limitations For:			
Septic Systems	Moderate: percs slowly	Severe: slope, depth to bedrock	Slight
Local Roads and Streets	Moderate: low strength	Severe: slope	Slight
Small Commercial Buildings	Severe: slope	Severe: slope	Slight
Dwellings without Basements	Moderate: slope	Severe: slope	Slight
Camp Areas	Moderate: slope	Severe: slope	Slight
Picnic Areas	Moderate: slope	Severe: slope	Slight
Playgrounds	Severe: slope	Severe: slope	Slight
Paths and Trails	Slight	Severe: slope	Slight

The Weoka Creek watershed lies within two Level III Ecoregions. The majority of the watershed is in the Piedmont (Southern Inner Piedmont Level IV Sub-ecoregion). The southern boundary area is in the Southeastern Plains (Fall Line Hills – Level IV Sub-ecoregion). In addition to the protected species found throughout the Lower Coosa River Basin (listed on page 14), the following protected species are found in the Walnut Creek watershed.

Common Name	**Scientific Name**	**Distribution in Lower Coosa River Basin**
Coldwater Darter	*Etheostoma ditrema*	(1) Spring-dwelling race-Shelby to Coosa Counties (2) Stream race-Waxahatchee Creek tribs, Shelby County; Coosa River tribs, Coosa County
Coal Darter	*Percina brevicauda*	Coosa River and Hatchet Creek
Bachman's Sparrow	*Aimophila aestivalis*	Coastal Plain and Piedmont province
Common Ground Dove	*Columbina passerine*	Coastal Plain province, rare above Fall Line
Bald Eagle	*Haliaeetus leucocephalus*	Coastal Plain and Piedmont province
Red-cockaded Woodpecker	*Picoides borealis*	Coastal Plain province
Southeastern Pocket Gopher	*Geomys pinetis*	Coastal Plain province
Meadow Jumping Mouse	*Zapus hudsonius*	Chilton, Coosa and Elmore Counties
Stocky Pebblesnail	*Somatogyrus crassus*	Main stem in Elmore, Chilton, Coosa Counties. May be extinct.
Hidden Pebblesnail	*Somatogyrus decipiens*	Chilton, Coosa Counties. May be extinct.
Fluted Pebblesnail	*Somatogyrus hendersoni*	Main stem, Coosa, Chilton Counties. May be extinct.
Dwarf Pebblesnail	*Somatogyrus nanus*	Main stem throughout basin. Weogufka Creek, Coosa County.
Moon Pebblesnail	*Somatogyrus obtusus*	Chilton-Coosa County shoals
Georgia Rock-cress	*Arabis Georgiana*	Elmore County
Nevius Stonecrop	*Sedum nevii*	Chilton, Coosa, Talladega Counties
Horse-nettle	*Solanum carolinense* var. *hirsutum*	Chilton, Coosa Counties

Demographics – 180

Population - Urban / Rural	Number	Percent
Total Population	6,110	100.00%
Urban	440	7.20%
Rural	5,670	92.80%
Farm	152	2.67%
Nonfarm	5,518	97.33%

Population By Race	Number	Percent
Total Population	6,110	99.74%
White	4,992	81.71%
Black	985	16.12%
American Indian / Alaskan	16	0.27%
Asian	17	0.02%
Native Hawaiian / Pacific Isl.	2	0.03%
Some Other Race	29	0.47%
Two or More Races	69	1.13%

Population By Age	Number	Percent
Total Population	6,110	100.00%
Under 18	1,398	22.89%
18 to 29 Years	916	14.99%
30 to 49 Years	1,947	31.87%
50 to 64 Years	1,062	17.39%
65 Years and Older	786	12.86%

Population in Households	Number	Percent
Total Population	6,110	100.00%
Population In households	5,789	94.76%
In Family Households	5,168	89.27%
In NonFamily Households	621	10.73%
In Group Quarters	320	5.24%
Institutionalized	318	99.14%
Noninstitutionalized	3	0.86%

Educational Attainment	Number	Percent
Total Population (25 & Over)	4,263	100.00%
No schooling completed	11	0.25%
Some School, No Diploma	992	23.28%
High School Graduate, GED	1,588	37.24%
Some College, No Degree	965	22.64%
Associate degree	186	4.37%
Bachelor's degree	269	6.30%
Master's degree	209	4.89%
Professional school degree	37	0.87%
Doctorate degree	7	0.15%

Place of Birth	Number	Percent
Total	6,110	100.00%
Native	6,051	99.05%
Born in Alabama	4,605	76.10%
Born in Northeast	152	2.52%
Born in Midwest	361	5.96%
Born in South	710	11.74%
Born in West	169	2.80%
Born outside US	54	0.89%
Foreign Born	58	0.95%
Naturalized citizen	36	62.40%
Not a citizen	22	37.60%

Residence in 1995	Number	Percent
Total Population (5 and Over)	5,760	100.00%
Same house in 1995	3,672	63.75%
Different house in 1995	2,088	36.25%
In United States in 1995	2,041	97.75%
Same County	842	41.24%
Different county	1,200	58.76%
Different county; Same state	891	43.64%
Different state	309	15.13%
Different state; Northeast	26	8.26%
Different state; Midwest	50	16.24%
Different state; South	215	69.71%
Different state; West	18	5.80%
Elsewhere	43	2.08%

Economics and Employment – 180

Median Family Income, 1999	$44,304
Median Household Income, 1999	$37,735
Median Per Capita Income, 1999	$17,714

Employment Status	Number	Percent
Population (16 and over)	4,925	100.00%
In labor force	2,854	57.95%
In Armed Forces	29	1.02%
Civilian	2,825	98.98%
Civilian; Employed	2,724	96.43%
Civilian; Unemployed	101	3.57%
Not in labor force	2,071	42.05%

Place of Work	Number	Percent
Workers (16 and over)	2,716	100.00%
Worked in Alabama	2,703	99.53%
In county of residence	1,106	40.90%
Outside county of residence	1,598	59.10%
Worked outside Alabama	13	0.47%

Transportation To Work	Number	Percent
Workers (16 and Over)	2,716	100.00%
Car; truck; or van	2,577	94.89%
Drove alone	2,319	89.98%
Carpooled	258	10.02%
Public transportation	0	0.00%
Motorcycle	0	0.00%
Bicycle	0	0.00%
Walked	25	0.93%
Other means	2	0.06%
Worked at home	112	4.12%

Travel Time to Work	Number	Percent
Total Workers (16 and over)	2,716	100.00%
Did Not Work at Home	2,604	95.88%
Less than 5 minutes	53	2.05%
5 to 9 minutes	101	3.86%
10 to 14 minutes	79	3.05%
15 to 19 minutes	205	7.86%
20 to 24 minutes	281	10.80%
25 to 29 minutes	117	4.48%
30 to 34 minutes	533	20.48%
35 to 39 minutes	185	7.11%
40 to 44 minutes	240	9.23%
45 to 59 minutes	627	24.09%
60 to 89 minutes	105	4.03%
90 or more minutes	77	2.97%
Worked at Home	112	4.12%

Employment By Industry	Number	Percent
Employed, 16 and Over	2,724	100.00%
Agri; Forestry; Fish/Hunt	61	2.22%
Mining	1	0.04%
Construction	311	11.43%
Manufacturing	439	16.10%
Wholesale Trade	119	4.36%
Retail Trade	346	12.68%
Transportation/Warehousing	53	1.94%
Utilities	63	2.30%
Information	51	1.89%
Finance and Insurance	119	4.37%
Real Estate	41	1.52%
Prof; Scientific; Tech Svcs	80	2.93%
Mgmt of Companies/Ent	0	0.00%
Admin; Waste Mgmt Svcs	102	3.75%
Educational Services	179	6.55%
Health Care/Social Assist.	234	8.61%
Arts; Entertainment; Rec	22	0.82%
Accommodation/Food Svcs	77	2.81%
Public Administration	242	8.87%
Other Services	185	6.81%

Median Year Structure Built	1979

Housing	Number	Percent
Total Housing Units	2,861	100.00%
Urban	68	2.38%
Rural	2,792	97.62%

Housing Occupancy	Number	Percent
Total	2,861	100.00%
Occupied	2,310	80.75%
Owner Occupied	2,019	87.40%
Renter Occupied	291	12.60%
Vacant	551	19.25%
For Rent	24	4.30%
For Sale Only	66	12.06%
Rented or Sold;	53	9.53%
For Seasonal Use	307	55.69%
For Migrant Workers	0	0.00%
Other vacant	101	18.41%

Household Size	Number	Percent
Total Occupied Housing Units	2,310	100.00%
1-person household	502	21.73%
2-person household	833	36.07%
3-person household	470	20.33%
4-person household	312	13.50%
5-person household	133	5.76%
6-person household	36	1.57%
7-or-more-person household	24	1.03%

Average Household Size	# Persons
All Housing Units	2.49
Owner occupied	2.58
Renter occupied	2.06

Units & Rooms in Structure	Number	Percent
Housing units: Total	2,861	100.00%
1 Unit - Detached	1,942	67.88%
1 Unit - Attached	45	1.58%
2 units in structure	3	0.10%
3 or 4 units in structure	19	0.66%
5 to 9 units in structure	10	0.36%
10 to 19 units in structure	0	0.00%
20 to 49 units in structure	2	0.06%
50 or more units in structure	0	0.00%
Mobile home	824	28.82%
Boat; RV; van; etc.	16	0.56%
Median number of rooms		5.46

House Heating Fuel	Number	Percent
Total Occupied Housing Units	2,310	100.00%
Utility gas	52	2.26%
Bottled; tank; or LP gas	1,043	45.17%
Electricity	1,110	48.06%
Fuel oil; kerosene; etc.	30	1.29%
Coal or coke	0	0.00%
Wood	58	2.53%
Solar energy	0	0.00%
Other fuel	7	0.30%
No fuel used	9	0.39%

Telephone Service	Number	Percent
Total Occupied Housing Units	2,310	100.00%
Telephone Service Available	2,208	95.57%
No Telephone Service Available	102	4.43%

Vehicles Available	Number	Percent
Total Occupied Housing Units	2,310	100.00%
No vehicle available	59	2.55%
1 vehicle available	528	22.85%
2 vehicles available	1,083	46.88%
3 vehicles available	382	16.55%
4 vehicles available	176	7.61%
5 or more vehicles available	83	3.57%

Plumbing Facilities	Number	Percent
Total Housing Units	2,861	100.00%
Complete plumbing facilities	2,836	99.14%
Lacking complete plumbing facilities	25	0.86%

Kitchen Facilities	Number	Percent
Total Housing Units	2,861	100.00%
Complete kitchen facilities	2,823	98.67%
Lacking complete kitchen facilities	38	1.33%

Rating and Issues – 180

Criteria	Rating
Impaired Water Bodies	1
ADEM Basin Assessment Rating for NPS Potential	1
NRCS Priority Watershed	1
AWW Water Quality Monitoring and Results	1
Use Classification	5
Land Use Character	1
Potential for Silviculture	3
Sediment Loads	1
Animal Density	1
Soil Suitability for Development	3
Growth Rate of County	4
Increase in Traffic Volume	2
Number of Permitted Dischargers	2
Presence of Hydroelectric Dam	5
Housing Density	4
Septic System Density	5
Number of Endangered Species	4
2000 Unemployment Rate	2
Total	**46 Low**

With a rating score of 46, the Weoka Creek watershed is considered to be a low priority watershed in the Lower Coosa River Basin. For more information on the watershed rating and ranking system, refer to the *Lower Coosa River Basin Management Plan*, Part IV, Chapter 12: Priority Watersheds.

A total of 23 issues were identified in the Lower Coosa River Basin. Of these, 12 are present in the Weoka Creek watershed, of which five are basinwide issues, four are regional issues, and three are local concerns. The focus of the regional watershed management measures for this watershed is managing growth and development pressures and water quality improvement.

Refer to the Lower Coosa River Basin Management Plan, Part IV, Chapter 14: Water Quality Improvement Strategy for management measures that may be implemented in this watershed.

Basinwide Issues:

- Endangered Species
- Lack of Water Quality Trend Data
- Illegal Dumping
- Lack of Education and Awareness
- FERC Relicensing of Hydroelectric Facilities

Regional Issues:

- Growth Rate and Urban Development
- Nutrients, Algae and Invasive Species
- Low Dissolved Oxygen
- Temperature and Thermal Stress

Local Concerns:

- Bacteria
- Turbidity
- Flooding

Pigeon Roost Creek Watershed
HUC: 03150107-190

Watershed Area:	11,288 ac.
Percent of Basin:	0.90%
Type:	Urban
County-Headwaters:	Elmore
County-Mouth:	Elmore
Municipalities:	Wetumpka
Total Population:	2,896
Percent of Basin:	2.64%

Land Use

Lakes and Ponds	905 ac
Cropland	2,370 ac
Pastureland	1,242 ac
Forestland	3,837 ac
Urbanized	2,934 ac
Mined Land	0 ac
Other Land	0 ac

Animal Data

Cattle	0
Dairy	0
Swine	0
Broilers	0
Layers	0
Catfish Acres	0

Domestic Water Data

Septic Tanks	0
Failing Septic Tanks	0
Alternative Systems	0

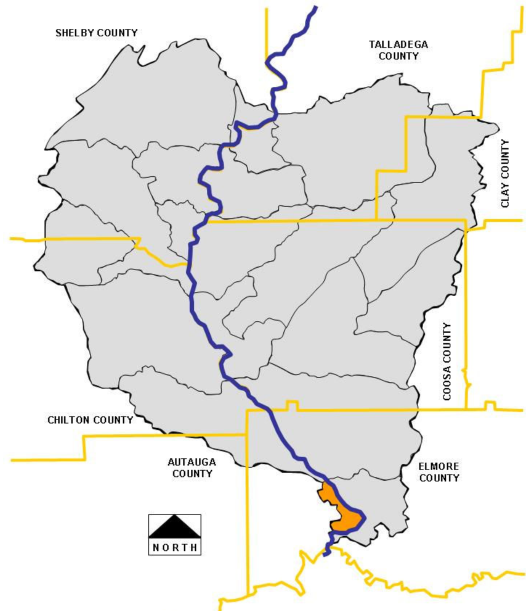
Sediment Loads (in tons)

Total	39,312
Cropland	1,422
Sand & Gravel Pits	0
Mined Land	0
Developing Urban Land	30,000
Gullies	4,900
Critical Areas	0
Streambanks	618
Dirt Roads and Banks	70
Woodland	2,302

Water Users

Public Water Supply	1
Total Permitted Dischargers	8
Municipal	2
Industrial	6
Mining	0

Pigeon Roost Creek Watershed Location Map



Impaired Water Bodies..None

Active Water Quality Monitoring Sites........................0

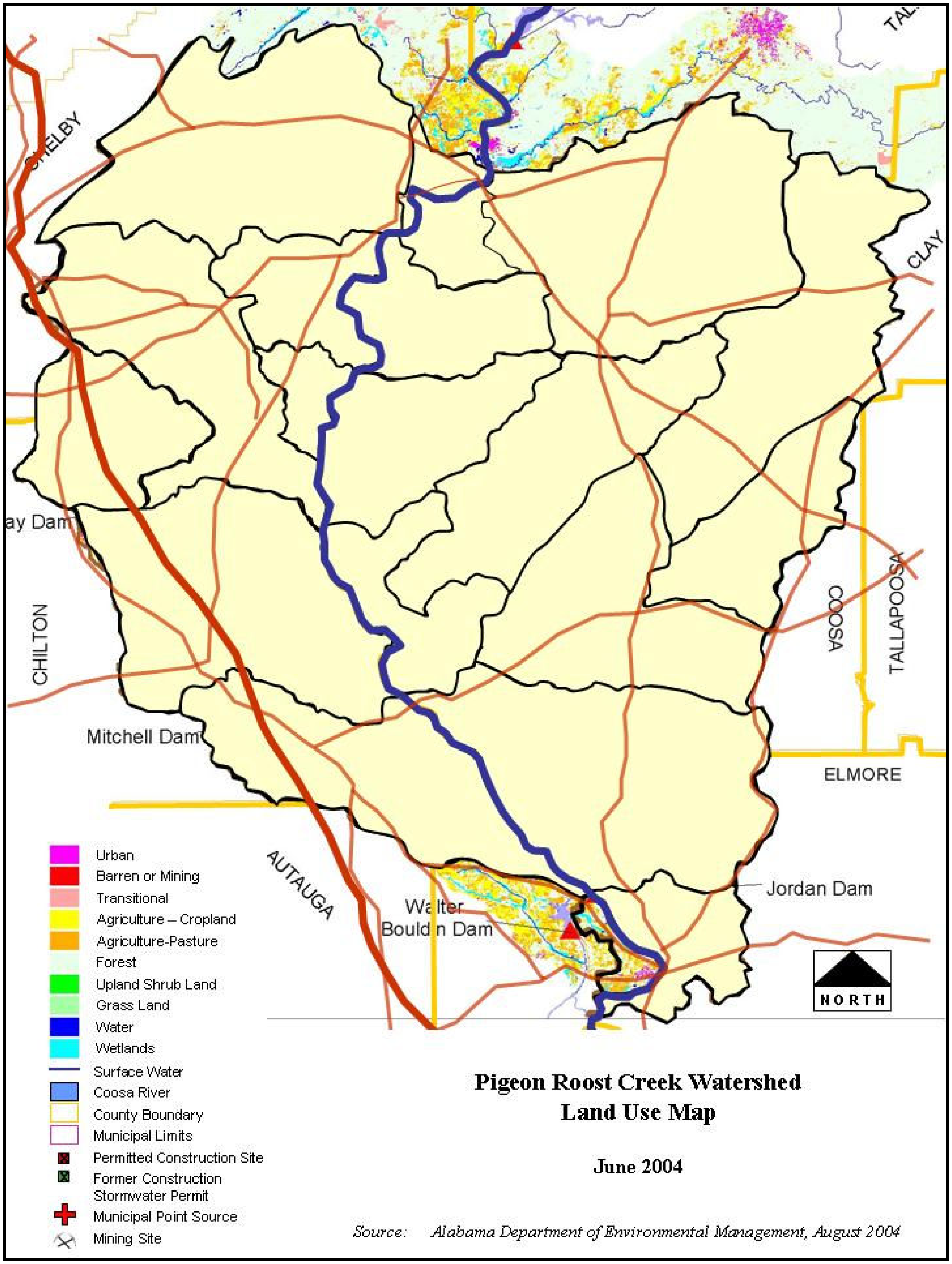
Suitability for Development.................................. Good

2005 Priority Watershed Rating...................... Moderate

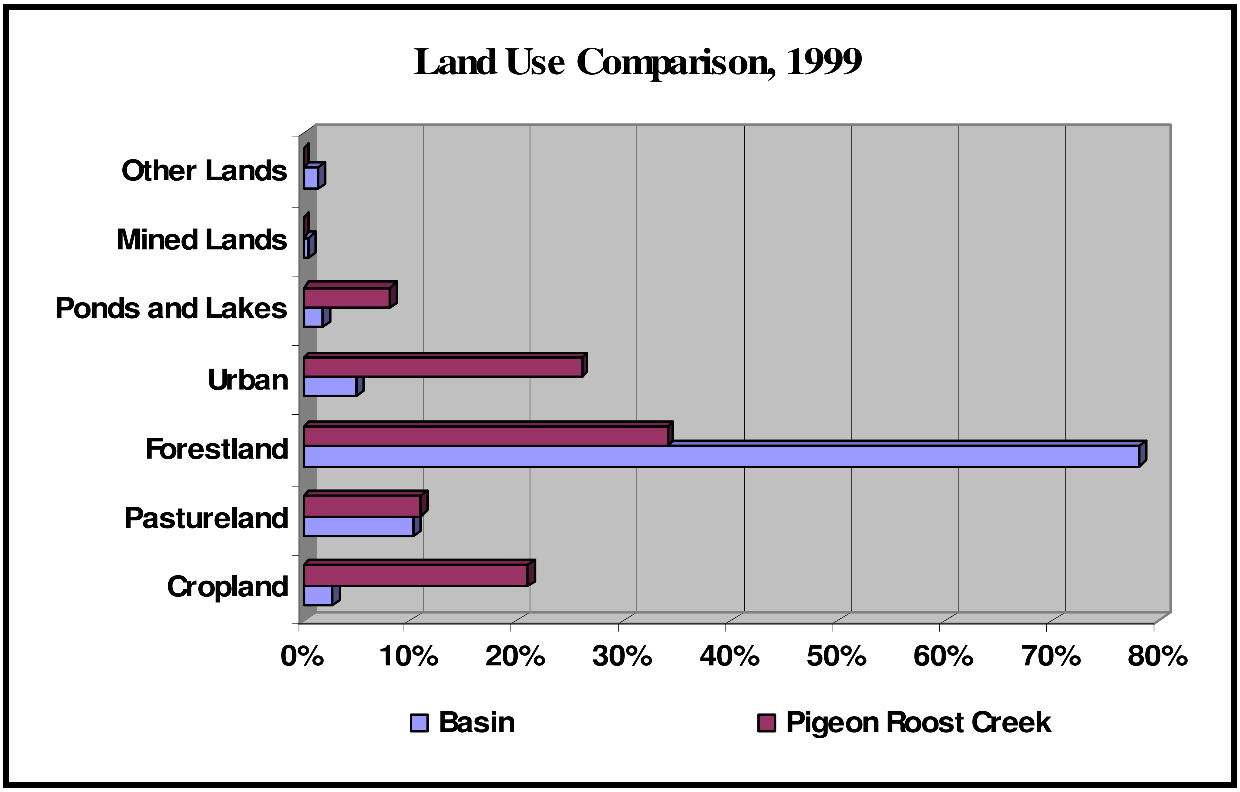
<u>Major Contributing Factors</u>

- Alabama Water Watch Water Quality Monitoring and Results
- Use Classification
- Urban Land Uses
- Increase in Traffic Volume
- Presence of a Hydroelectric Dam
- Housing Density
- Number of Endangered Species
- High 2000 Unemployment Rate

Land Use – 190



SHELBY
TAL
CLAY
ay Dam
CHILTON
COOSA
TALLAPOOSA
Mitchell Dam
ELMORE
AUTAUGA
Walter Bouldin Dam
Jordan Dam
NORTH
Urban
Barren or Mining
Transitional
Agriculture – Cropland
Agriculture-Pasture
Forest
Upland Shrub Land
Grass Land
Water
Wetlands
Surface Water
Coosa River
County Boundary
Municipal Limits
Permitted Construction Site
Former Construction Stormwater Permit
Municipal Point Source
Mining Site
Pigeon Roost Creek Watershed
Land Use Map
June 2004
Source: Alabama Department of Environmental Management, August 2004



Land Use Patterns

Overall, the Pigeon Roost Creek watershed has an urban character, with 26 percent of the land in urban land uses, as compared with 5 percent of the land in the Lower Coosa River Basin in urban use. This is the highest percentage of urban land use of any of the 20 watersheds in the basin. The urban land uses are primarily concentrated in the southern part of the watershed around the Wetumpka area. The watershed also has a high percentage of agricultural land, at 32 percent of the total land, of which 21 percent is cropland and 11 percent is pasture. Agricultural land is located throughout the southern and western parts of the watershed. Only 34 percent of the watershed is used for forest purposes. Of the total forest land in the watershed, 44.48 percent is deciduous forest, 2.92 percent is evergreen forest, and 52.60 percent is mixed forest. The amount of land in pond and lake usage, at 8 percent of the total land, is also high and accounts for the presence of Lake Jordan.

Sediment production in the Pigeon Roost Creek watershed is moderate, at 3.48 tons per acre. The major source of sediment is developing urban lands, at 2.66 tons per acre, followed distantly by gullies, at .43 tons per acre, and woodlands, at .20 tons per acre.

Two major roads are located in the Pigeon Roost Creek watershed: Alabama Highway 14 and Alabama Highway 111. Highway 14 runs east-west in the southern part of the watershed and Highway 111 runs north-south through the central part of the watershed. No measurements of traffic volume were made on either road within the watershed boundaries.

Soils and Species – 190

The Pigeon Roost Creek watershed is comprised of soils in two soil associations. The northern and western parts of the watershed are made up of soils in the Lucedale-Bama Association and the southeastern portion, along the Coosa River, is made of soils in the Cahaba-Chewacla-Myatt Association. The soil suitability and limitations for selected uses are provided in the table below. For a map of the soil associations in the watershed and in the Lower Coosa River Basin, refer to the Soil Association Map on page 9.

Soil Association Number	39	53
Soil Association	Lucedale-Bama	Cahaba-Chewacla-Myatt
Dominant Slope, %	0 - 5	0 - 5
Soil Suitability and Major Limitations For:		
Cropland	Good	Good
Pastureland	Good	Good
Woodland	Good	Good
Soil Limitations For:		
Septic Systems	Slight	Severe: floods
Local Roads and Streets	Slight	Severe: floods
Small Commercial Buildings	Slight	Severe: floods
Dwellings without Basements	Slight	Severe: floods
Camp Areas	Slight	Severe: floods
Picnic Areas	Slight	Severe: floods
Playgrounds	Slight	Severe: floods
Paths and Trails	Slight	Severe: floods

The Pigeon Roost Creek watershed is located in the Southeastern Plains Level III Eco-region. The watershed is subdivided into two Level IV sub-ecoregions: the Fall Line Hills in the northern quarter and the remainder in the Southeastern Floodplains and Low Terraces. In addition to the protected species found throughout the Lower Coosa River Basin (listed on page 14), the following protected species are found in the Pigeon Roost Creek watershed.

Common Name	Scientific Name	Distribution in Lower Coosa River Basin
Crystal Darter	*Crystallaria asprella*	Elmore County, below Jordan Dam
Bachman's Sparrow	*Aimophila aestivalis*	Coastal Plain and Piedmont province
Common Ground Dove	*Columbina passerine*	Coastal Plain province, rare above Fall Line
Bald Eagle	*Haliaeetus leucocephalus*	Coastal Plain and Piedmont province
Red-cockaded Woodpecker	*Picoides borealis*	Coastal Plain province
Southeastern Pocket Gopher	*Geomys pinetis*	Coastal Plain province
Meadow Jumping Mouse	*Zapus hudsonius*	Chilton, Coosa and Elmore Counties
Silt Elimia	*Elimia haysiana*	Below Jordan Dam, Elmore County
Round Rocksnail	*Leptoxis ampla*	Near Wetumpka, Elmore County
Spotted Rocksnail	*Leptoxis picta*	Near Wetumpka, Elmore County
Painted Rocksnail	*Leptoxis tainiata*	Shoals near Wetumpka, Elmore County; Buxahatchee Creek, Shelby County
Knotty Pebblesnail	*Smoatogyrus constrictus*	Wetumpka, Elmore Co; Wilsonville, Shelby Co. May be extinct.
Stocky Pebblesnail	*Somatogyrus crassus*	Main stem in Elmore, Chilton, Coosa Co. May be extinct.
Granite Pebblesnail	*Somatogyrus hinkleyi*	Wetumpka, Elmore County; Wilsonville, Shelby County.
Dwarf Pebblesnail	*Somatogyrus nanus*	Main stem throughout basin. Weogufka Creek, Coosa County.
Tulotoma Snail	*Tulotoma magnifica*	Near Wetumpka, Elmore County; Weogufka Creek, Hatchet Creek, Coosa County.
Cobblestone Tiger Beetle	*Cicindela marginipennis*	Near Wetumpka, Elmore County
Georgia Rock-cress	*Arabis Georgiana*	Elmore County
Alabama Canebrake Pitcherplant	*Sarracenia rubra*	Autauga, Chilton, Elmore Counties

Population - Urban / Rural	Number	Percent
Total Population	2,896	100.00%
Urban	1,889	65.22%
Rural	1,007	34.78%
Farm	3	0.30%
Nonfarm	1,004	99.70%

Population By Race	Number	Percent
Total Population	2,896	99.83%
White	1,625	56.12%
Black	1,193	41.20%
American Indian / Alaskan	7	0.22%
Asian	5	0.00%
Native Hawaiian / Pacific Isl.	0	0.00%
Some Other Race	4	0.12%
Two or More Races	63	2.16%

Population By Age	Number	Percent
Total Population	2,896	100.00%
Under 18	798	27.54%
18 to 29 Years	407	14.06%
30 to 49 Years	802	27.70%
50 to 64 Years	394	13.59%
65 Years and Older	496	17.11%

Population in Households	Number	Percent
Total Population	2,896	100.00%
Population In households	2,766	95.53%
In Family Households	2,409	87.09%
In NonFamily Households	357	12.91%
In Group Quarters	130	4.47%
Institutionalized	130	100.00%
Noninstitutionalized	0	0.00%

Educational Attainment	Number	Percent
Total Population (25 & Over)	1,860	100.00%
No schooling completed	17	0.91%
Some School, No Diploma	570	30.65%
High School Graduate, GED	529	28.42%
Some College, No Degree	376	20.19%
Associate degree	88	4.73%
Bachelor's degree	186	9.98%
Master's degree	74	3.95%
Professional school degree	22	1.16%
Doctorate degree	0	0.00%

Place of Birth	Number	Percent
Total	2,896	100.00%
Native	2,892	99.88%
Born in Alabama	2,456	84.92%
Born in Northeast	27	0.92%
Born in Midwest	114	3.94%
Born in South	255	8.82%
Born in West	22	0.74%
Born outside US	19	0.66%
Foreign Born	4	0.12%
Naturalized citizen	4	100.00%
Not a citizen	0	0.00%

Residence in 1995	Number	Percent
Total Population (5 and Over)	2,689	100.00%
Same house in 1995	1,392	51.75%
Different house in 1995	1,298	48.25%
In United States in 1995	1,281	98.73%
Same County	672	52.46%
Different county	609	47.54%
Different county; Same state	520	40.59%
Different state	89	6.95%
Different state; Northeast	0	0.00%
Different state; Midwest	20	22.47%
Different state; South	64	71.91%
Different state; West	5	5.62%
Elsewhere	17	1.27%

Economics and Employment – 190

Median Family Income, 1999	$36,590
Median Household Income, 1999	$28,803
Median Per Capita Income, 1999	$13,938

Employment Status	Number	Percent
Population (16 and over)	2,192	100.00%
In labor force	1,255	57.25%
In Armed Forces	20	1.55%
Civilian	1,236	98.45%
Civilian; Employed	1,120	90.65%
Civilian; Unemployed	116	9.35%
Not in labor force	937	42.75%

Place of Work	Number	Percent
Workers (16 and over)	1,118	100.00%
Worked in Alabama	1,112	99.46%
In county of residence	504	45.32%
Outside county of residence	608	54.68%
Worked outside Alabama	6	0.54%

Transportation To Work	Number	Percent
Workers (16 and Over)	1,118	100.00%
Car; truck; or van	1,098	98.21%
Drove alone	964	87.75%
Carpooled	135	12.25%
Public transportation	0	0.00%
Motorcycle	0	0.00%
Bicycle	0	0.00%
Walked	4	0.36%
Other means	0	0.00%
Worked at home	16	1.43%

Travel Time to Work	Number	Percent
Total Workers (16 and over)	1,118	100.00%
Did Not work at Home	1,102	98.57%
Less than 5 minutes	45	4.08%
5 to 9 minutes	118	10.66%
10 to 14 minutes	159	14.38%
15 to 19 minutes	140	12.70%
20 to 24 minutes	131	11.84%
25 to 29 minutes	79	7.17%
30 to 34 minutes	220	19.92%
35 to 39 minutes	39	3.54%
40 to 44 minutes	51	4.58%
45 to 59 minutes	87	7.85%
60 to 89 minutes	16	1.45%
90 or more minutes	20	1.81%
Worked at Home	16	1.43%

Employment By Industry	Number	Percent
Employed, 16 and Over	1,120	100.00%
Agri; Forestry; Fish/Hunt	7	0.63%
Mining	0	0.00%
Construction	96	8.57%
Manufacturing	206	18.39%
Wholesale Trade	20	1.74%
Retail Trade	115	10.22%
Transportation/Warehousing	44	3.88%
Utilities	18	1.56%
Information	3	0.27%
Finance and Insurance	43	3.79%
Real Estate	8	0.71%
Prof; Scientific; Tech Svcs	62	5.54%
Mgmt of Companies/Ent	0	0.00%
Admin; Waste Mgmt Svcs	22	1.92%
Educational Services	58	5.13%
Health Care/Social Assist.	185	16.47%
Arts; Entertainment; Rec	3	0.27%
Accommodation/Food Svcs	67	5.94%
Public Administration	103	9.20%
Other Services	65	5.76%

Housing – 190

Median Year Structure Built	1965

Housing	Number	Percent
Total Housing Units	1,299	100.00%
Urban	914	70.36%
Rural	385	29.64%

Housing Occupancy	Number	Percent
Total	1,299	100.00%
Occupied	1,129	86.87%
Owner Occupied	783	69.34%
Renter Occupied	346	30.66%
Vacant	171	13.13%
For Rent	55	31.96%
For Sale Only	19	11.14%
Rented or Sold;	30	17.30%
For Seasonal Use	0	0.00%
For Migrant Workers	0	0.00%
Other vacant	68	39.59%

Household Size	Number	Percent
Total Occupied Housing Units	1,129	100.00%
1-person household	329	29.15%
2-person household	367	32.48%
3-person household	172	15.24%
4-person household	145	12.80%
5-person household	72	6.34%
6-person household	19	1.64%
7-or-more-person household	27	2.35%

Average Household Size	# Persons
All Housing Units	2.44
Owner occupied	2.42
Renter occupied	2.62

Units & Rooms in Structure	Number	Percent
Housing units: Total	1,299	100.00%
1 Unit - Detached	1,000	76.94%
1 Unit - Attached	41	3.16%
2 units in structure	59	4.54%
3 or 4 units in structure	20	1.54%
5 to 9 units in structure	23	1.73%
10 to 19 units in structure	0	0.00%
20 to 49 units in structure	25	1.92%
50 or more units in structure	0	0.00%
Mobile home	132	10.16%
Boat; RV; van; etc.	0	0.00%
Median number of rooms		5.45

House Heating Fuel	Number	Percent
Total Occupied Housing Units	1,129	100.00%
Utility gas	602	53.35%
Bottled; tank; or LP gas	105	9.30%
Electricity	413	36.55%
Fuel oil; kerosene; etc.	6	0.53%
Coal or coke	0	0.00%
Wood	3	0.27%
Solar energy	0	0.00%
Other fuel	0	0.00%
No fuel used	0	0.00%

Telephone Service	Number	Percent
Total Occupied Housing Units	1,129	100.00%
Telephone Service Available	1,021	90.47%
No Telephone Service Available	108	9.53%

Vehicles Available	Number	Percent
Total Occupied Housing Units	1,129	100.00%
No vehicle available	70	6.16%
1 vehicle available	496	43.91%
2 vehicles available	394	34.91%
3 vehicles available	121	10.72%
4 vehicles available	28	2.44%
5 or more vehicles available	21	1.86%

Plumbing Facilities	Number	Percent
Total Housing Units	1,299	100.00%
Complete plumbing facilities	1,253	96.42%
Lacking complete plumbing facilities	47	3.58%

Kitchen Facilities	Number	Percent
Total Housing Units	1,299	100.00%
Complete kitchen facilities	1,242	95.61%
Lacking complete kitchen facilities	57	4.39%

Rating and Issues – 190

Criteria	Rating
Impaired Water Bodies	1
ADEM Basin Assessment Rating for NPS Potential	1
NRCS Priority Watershed	1
AWW Water Quality Monitoring and Results	5
Use Classification	5
Land Use Character	5
Potential for Silviculture	1
Sediment Loads	2
Animal Density	1
Soil Suitability for Development	2
Growth Rate of County	4
Increase in Traffic Volume	5
Number of Permitted Dischargers	2
Presence of Hydroelectric Dam	5
Housing Density	5
Septic System Density	1
Number of Endangered Species	5
2000 Unemployment Rate	5
Total	**56 Moderate**

With a rating score of 56, the Pigeon Roost Creek watershed is considered to be a moderate priority watershed in the Lower Coosa River Basin. For more information on the watershed rating and ranking system, refer to the *Lower Coosa River Basin Management Plan*, Part IV, Chapter 12: Priority Watersheds.

A total of 23 issues were identified in the Lower Coosa River Basin. Of these, 12 are present in the Pigeon Roost Creek watershed, of which five are basinwide issues, five are regional issues, and two are local concerns. The focus of the regional watershed management measures for this watershed is managing growth and development pressures, mitigating stormwater runoff and protection of aquatic habitat.

Refer to the Lower Coosa River Basin Management Plan, Part IV, Chapter 14: Water Quality Improvement Strategy for management measures that may be implemented in this watershed.

Basinwide Issues:

- Endangered Species
- Lack of Water Quality Trend Data
- Illegal Dumping
- Lack of Education and Awareness
- FERC Relicensing of Hydroelectric Facilities

Regional Issues:

- Compliance with the *Recovery Plan for the Mobile River Basin Aquatic Ecosystem*
- Designation as a Critical Habitat
- Growth Rate and Urban Development
- Agricultural Runoff
- Urban Runoff

Local Concerns:

- Turbidity
- Flooding

Taylor Creek Watershed
HUC: 03150107-200

Watershed Area:	28,915 ac.
Percent of Basin:	2.31%
Type:	Urban
County-Headwaters:	Elmore
County-Mouth:	Elmore
Municipalities:	Wetumpka
Total Population:	5,471
Percent of Basin:	4.99%

Land Use	
Lakes and Ponds	200 ac
Cropland	819 ac
Pastureland	5,460 ac
Forestland	16,611 ac
Urbanized	5,823 ac
Mined Land	0 ac
Other Land	0 ac

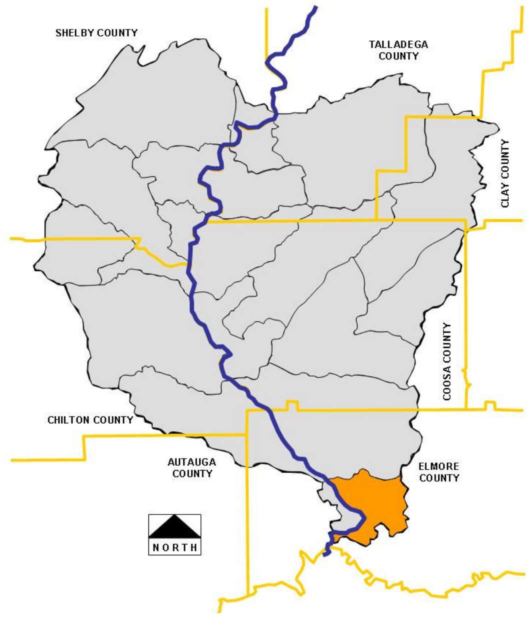
Animal Data	
Cattle	0
Dairy	0
Swine	0
Broilers	0
Layers	0
Catfish Acres	0

Domestic Water Data	
Septic Tanks	0
Failing Septic Tanks	0
Alternative Systems	0

Sediment Loads (in tons)	
Total	795,004
Cropland	2,801
Sand & Gravel Pits	0
Mined Land	0
Developing Urban Land	750,000
Gullies	24,500
Critical Areas	7,500
Streambanks	78
Dirt Roads and Banks	158
Woodland	9,967

Water Users	
Public Water Supply	0
Total Permitted Dischargers	8
Municipal	1
Industrial	6
Mining	1

Taylor Creek Watershed Location Map



Impaired Water Bodies...None

Active Water Quality Monitoring Sites........................0

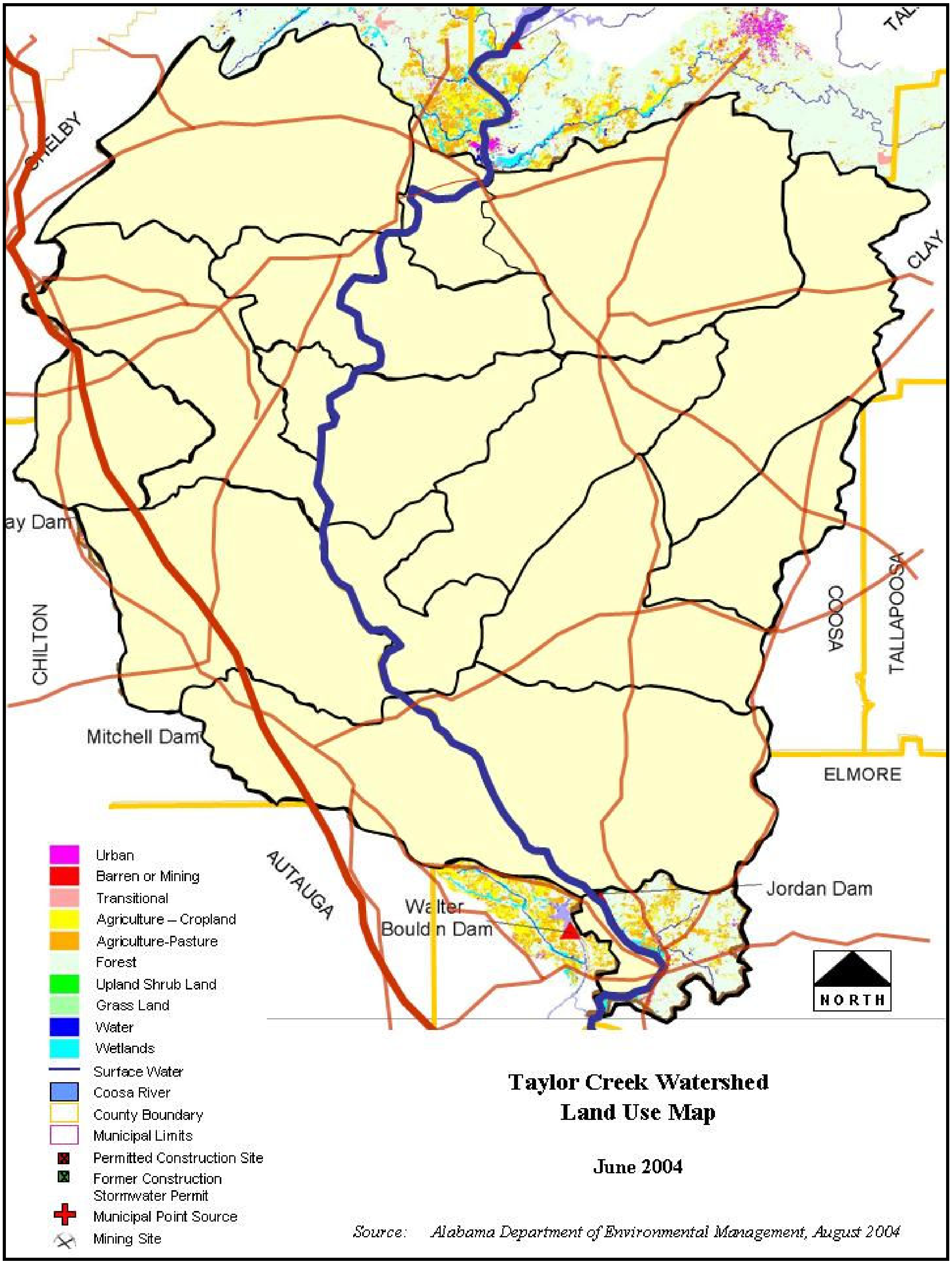
Suitability for Development................................. Good

2005 Priority Watershed Rating............................ High

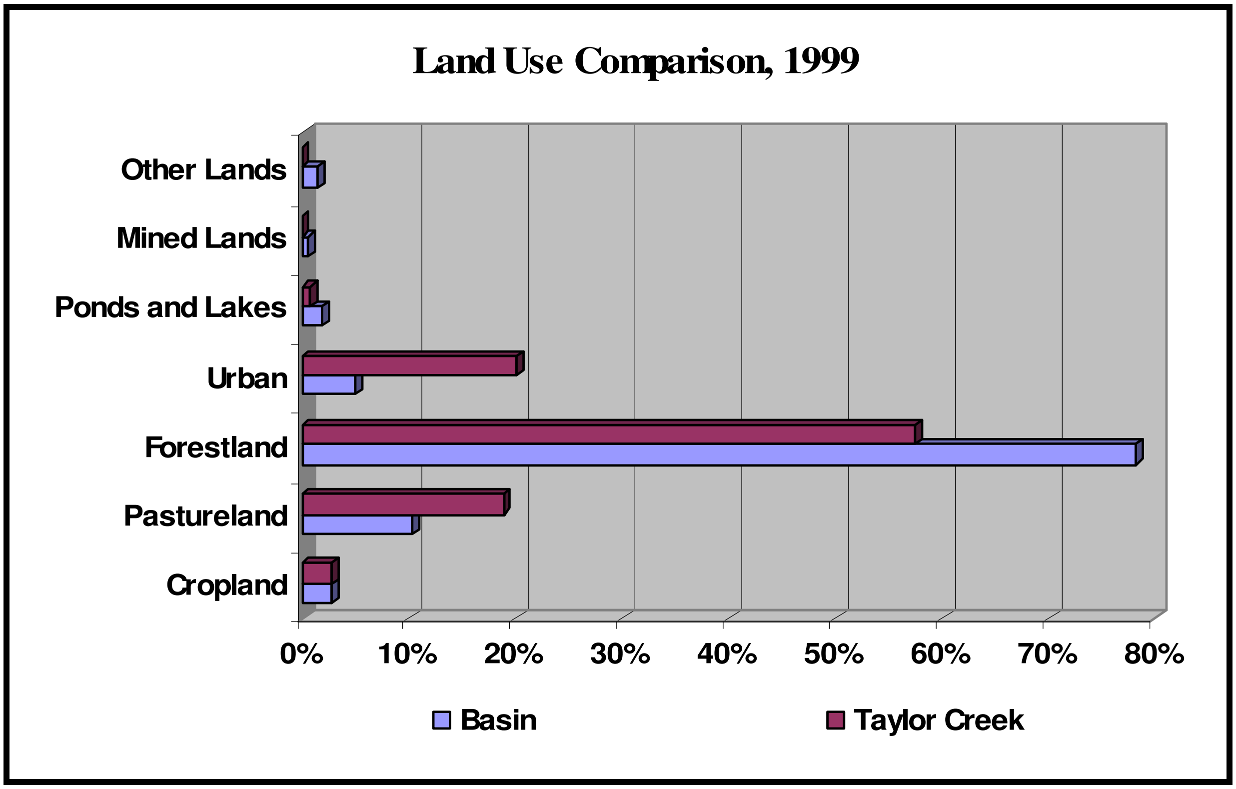
Major Contributing Factors

- ADEM Assessment Rating for Nonpoint Source Pollution
- Alabama Water Watch Water Quality Monitoring and Results
- Use Classification
- Land Use Character
- Sediment Loads
- Presence of a Hydroelectric Dam
- Housing Density
- Number of Endangered Species

Land Use – 200



SHELBY
TAL
CLAY
ay Dam
CHILTON
COOSA
TALLAPOOSA
Mitchell Dam
ELMORE
AUTAUGA
Walter Bouldin Dam
Jordan Dam
NORTH
Urban
Barren or Mining
Transitional
Agriculture – Cropland
Agriculture-Pasture
Forest
Upland Shrub Land
Grass Land
Water
Wetlands
Surface Water
Coosa River
County Boundary
Municipal Limits
Permitted Construction Site
Former Construction Stormwater Permit
Municipal Point Source
Mining Site
Taylor Creek Watershed
Land Use Map
June 2004
Source: Alabama Department of Environmental Management, August 2004



Land Use Patterns

The Taylor Creek watershed has an urban character, with 20 percent of the land in urban land uses, as compared with 5 percent of the total land in the basin in urban use. The urban land uses are primarily concentrated in the southwestern part of the watershed around the Wetumpka area and along the U.S. Highway 231 corridor. Forest land comprises 57 percent of the land in the watershed. The greatest concentrations of forest land are found in the extreme northwest and in the eastern part of the watershed. Of the total forest land in the watershed, 24.87 percent is deciduous (which is very low in comparison to the other watersheds in the basin), 27.58 is evergreen forest, and 47.55 percent is mixed forest. The high percentage of mixed and evergreen forest combined indicates a high potential for active silviculture within the watershed. The Taylor Creek watershed also has a high percentage of agricultural land, at 22 percent of the total land, in comparison to the basin overall, at 13 percent. Of the total land in the watershed, 3 percent is used for cropland and 19 percent is used for pasture. Sediment production in the Taylor Creek watershed is the highest of all 20 watersheds in the basin, at 27.50 tons per acre. The largest source of sediment in the watershed, by far, is developing urban lands which produce 25.94 tons per acre. There are four major roads in the Taylor Creek watershed: U.S. Highway 231, Alabama Highway 9, Alabama Highway 14, and Alabama Highway 170. U.S. Highway 231 runs northwest-southeast through the central part of the watershed. Highway 9 runs northeast-southwest in the central part of the watershed. These two roads intersect just north of Alabama Highway 14 which runs east-west through the southern part of the watershed. Highway 170 runs northeast from Highway 14 in the eastern part of the watershed. Traffic volume increased substantially between 1994 and 2002 on Highway 231, at 17.70 percent, while traffic volume decreased by .36 percent on Highway 9 in the same time period.

Soils and Species – 200

The Taylor Creek watershed is comprised of soils in three soil associations. The predominant soil group is the Dothan-Fuquay-Wagram Association, which encompasses almost the entire watershed. The exceptions are a small amount of the Cahaba-Chewacla-Myatt Association along the Coosa River and a small amount of the Troup-Luverne-Dothan-Orangeburg Association at the southern tip of the watershed. The soil suitability and limitations for selected uses are provided in the table below. For a map of the soil associations in the watershed and in the Lower Coosa River Basin, refer to the Soil Association Map on page 9.

Soil Association Number	30	47	53
Soil Association	**Dothan-Fuquay-Wagram**	**Troup-Luverne-Dothan-Orangeburg**	**Cahaba-Chewacla-Myatt**
Dominant Slope, %	2 - 15	2 - 30	0 - 5
Soil Suitability and Major Limitations For:			
Cropland	Good	Poor: slope	Good
Pastureland	Good	Poor: slope	Good
Woodland	Good	Good	Good
Soil Limitations For:			
Septic Systems	Moderate: percs slowly	Severe: slope	Severe: floods
Local Roads and Streets	Slight	Severe: slope	Severe: floods
Small Commercial Buildings	Moderate: slope	Severe: slope	Severe: floods
Dwellings without Basements	Slight	Severe: slope	Severe: floods
Camp Areas	Slight	Severe: slope	Severe: floods
Picnic Areas	Slight	Severe: slope	Severe: floods
Playgrounds	Moderate: slope	Severe: slope	Severe: floods
Paths and Trails	Slight	Moderate: too sandy, slope	Severe: floods

The Taylor Creek watershed is located in the Southeastern Plains Level III Eco-region. The watershed is subdivided into two Level IV sub-ecoregions: the Southeastern Floodplains and Low Terraces along the Coosa River and the remainder in the Fall Line Hills. In addition to the protected species found throughout the Lower Coosa River Basin (listed on page 14), the following protected species are found in the Taylor Creek watershed.

Common Name	Scientific Name	Distribution in Lower Coosa River Basin
Crystal Darter	*Crystallaria asprella*	Elmore County, below Jordan Dam
Bachman's Sparrow	*Aimophila aestivalis*	Coastal Plain and Piedmont province
Common Ground Dove	*Columbina passerine*	Coastal Plain province, rare above Fall Line
Bald Eagle	*Haliaeetus leucocephalus*	Coastal Plain and Piedmont province
Red-cockaded Woodpecker	*Picoides borealis*	Coastal Plain province
Southeastern Pocket Gopher	*Geomys pinetis*	Coastal Plain province
Meadow Jumping Mouse	*Zapus hudsonius*	Chilton, Coosa and Elmore Counties
Silt Elimia	*Elimia haysiana*	Below Jordan Dam, Elmore County
Round Rocksnail	*Leptoxis ampla*	Near Wetumpka, Elmore County
Spotted Rocksnail	*Leptoxis picta*	Near Wetumpka, Elmore County
Painted Rocksnail	*Leptoxis tainiata*	Shoals near Wetumpka, Elmore County; Buxahatchee Creek, Shelby County
Knotty Pebblesnail	*Smoatogyrus constrictus*	Wetumpka, Elmore Co; Wilsonville, Shelby Co. May be extinct.
Stocky Pebblesnail	*Somatogyrus crassus*	Main stem in Elmore, Chilton, Coosa Counties. May be extinct.
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Tulotoma Snail	*Tulotoma magnifica*	Near Wetumpka, Elmore Co; Weogufka Creek, Hatchet Creek, Coosa Co.
Cobblestone Tiger Beetle	*Cicindela marginipennis*	Near Wetumpka, Elmore County
Georgia Rock-cress	*Arabis Georgiana*	Elmore County
AL Canebrake Pitcherplant	*Sarracenia rubra*	Autauga, Chilton, Elmore Counties

Demographics – 200

Population - Urban / Rural	Number	Percent
Total Population	5,471	100.00%
Urban	1,545	28.24%
Rural	3,926	71.76%
Farm	182	4.64%
Nonfarm	3,744	95.36%

Population By Race	Number	Percent
Total Population	5,471	99.83%
White	3,834	70.08%
Black	1,468	26.84%
American Indian / Alaskan	30	0.55%
Asian	10	0.01%
Native Hawaiian / Pacific Isl.	10	0.19%
Some Other Race	12	0.21%
Two or More Races	106	1.94%

Population By Age	Number	Percent
Total Population	5,471	100.00%
Under 18	1,213	22.17%
18 to 29 Years	934	17.07%
30 to 49 Years	2,003	36.62%
50 to 64 Years	785	14.36%
65 Years and Older	535	9.78%

Population in Households	Number	Percent
Total Population	5,471	100.00%
Population In households	4,458	81.49%
In Family Households	4,059	91.06%
In NonFamily Households	399	8.94%
In Group Quarters	1,013	18.51%
Institutionalized	1,005	99.19%
Noninstitutionalized	8	0.81%

Educational Attainment	Number	Percent
Total Population (25 & Over)	3,765	100.00%
No schooling completed	34	0.89%
Some School, No Diploma	938	24.92%
High School Graduate, GED	1,384	36.75%
Some College, No Degree	871	23.13%
Associate degree	164	4.35%
Bachelor's degree	229	6.09%
Master's degree	105	2.80%
Professional school degree	30	0.78%
Doctorate degree	11	0.28%

Place of Birth	Number	Percent
Total	5,471	100.00%
Native	5,412	98.94%
Born in Alabama	3,994	73.80%
Born in Northeast	201	3.71%
Born in Midwest	237	4.37%
Born in South	738	13.63%
Born in West	150	2.76%
Born outside US	93	1.72%
Foreign Born	58	1.06%
Naturalized citizen	36	62.40%
Not a citizen	22	37.60%

Residence in 1995	Number	Percent
Total Population (5 and Over)	5,188	100.00%
Same house in 1995	2,594	50.00%
Different house in 1995	2,594	50.00%
In United States in 1995	2,528	97.43%
Same County	883	34.95%
Different county	1,644	65.05%
Different county; Same state	1,356	53.66%
Different state	288	11.39%
Different state; Northeast	26	8.95%
Different state; Midwest	74	25.71%
Different state; South	138	48.03%
Different state; West	50	17.32%
Elsewhere	56	2.16%

Economics and Employment – 200

Median Family Income, 1999	$47,831
Median Household Income, 1999	$40,272
Median Per Capita Income, 1999	$18,957

Employment Status	Number	Percent
Population (16 and over)	4,389	100.00%
In labor force	2,174	49.53%
In Armed Forces	46	2.11%
Civilian	2,129	97.89%
Civilian; Employed	2,041	95.88%
Civilian; Unemployed	88	4.12%
Not in labor force	2,215	50.47%

Place of Work	Number	Percent
Workers (16 and over)	2,051	100.00%
Worked in Alabama	2,043	99.60%
In county of residence	726	35.55%
Outside county of residence	1,316	64.45%
Worked outside Alabama	8	0.40%

Transportation To Work	Number	Percent
Workers (16 and Over)	2,051	100.00%
Car; truck; or van	1,992	97.14%
Drove alone	1,748	87.72%
Carpooled	245	12.28%
Public transportation	0	0.00%
Motorcycle	0	0.00%
Bicycle	0	0.00%
Walked	13	0.65%
Other means	7	0.36%
Worked at home	38	1.86%

Travel Time to Work	Number	Percent
Total Workers (16 and over)	2,051	100.00%
Did Not work at Home	2,013	98.14%
Less than 5 minutes	5	0.27%
5 to 9 minutes	105	5.20%
10 to 14 minutes	178	8.82%
15 to 19 minutes	244	12.12%
20 to 24 minutes	215	10.67%
25 to 29 minutes	86	4.29%
30 to 34 minutes	489	24.29%
35 to 39 minutes	171	8.47%
40 to 44 minutes	156	7.73%
45 to 59 minutes	217	10.78%
60 to 89 minutes	99	4.93%
90 or more minutes	49	2.43%
Worked at Home	38	1.86%

Employment By Industry	Number	Percent
Employed, 16 and Over	2,041	100.00%
Agri; Forestry; Fish/Hunt	29	1.44%
Mining	7	0.32%
Construction	204	10.02%
Manufacturing	304	14.90%
Wholesale Trade	72	3.55%
Retail Trade	266	13.04%
Transportation/Warehousing	38	1.88%
Utilities	20	0.98%
Information	44	2.15%
Finance and Insurance	117	5.75%
Real Estate	26	1.27%
Prof; Scientific; Tech Svcs	81	3.97%
Mgmt of Companies/Ent	0	0.00%
Admin; Waste Mgmt Svcs	35	1.70%
Educational Services	98	4.80%
Health Care/Social Assist.	209	10.26%
Arts; Entertainment; Rec	24	1.20%
Accommodation/Food Svcs	107	5.23%
Public Administration	232	11.36%
Other Services	126	6.18%

Median Year Structure Built	1986

Housing	Number	Percent
Total Housing Units	1,876	100.00%
Urban	317	16.90%
Rural	1,559	83.10%

Housing Occupancy	Number	Percent
Total	1,876	100.00%
Occupied	1,718	91.56%
Owner Occupied	1,374	79.97%
Renter Occupied	344	20.03%
Vacant	158	8.44%
For Rent	45	28.31%
For Sale Only	25	15.51%
Rented or Sold;	65	41.23%
For Seasonal Use	8	4.99%
For Migrant Workers	0	0.00%
Other vacant	16	9.95%

Household Size	Number	Percent
Total Occupied Housing Units	1,718	100.00%
1-person household	380	22.12%
2-person household	572	33.31%
3-person household	351	20.44%
4-person household	249	14.49%
5-person household	111	6.48%
6-person household	38	2.21%
7-or-more-person household	16	0.95%

Average Household Size	# Persons
All Housing Units	2.54
Owner occupied	2.69
Renter occupied	2.19

Units & Rooms in Structure	Number	Percent
Housing units: Total	1,876	100.00%
1 Unit - Detached	1,168	62.28%
1 Unit - Attached	6	0.30%
2 units in structure	11	0.60%
3 or 4 units in structure	79	4.22%
5 to 9 units in structure	35	1.84%
10 to 19 units in structure	9	0.47%
20 to 49 units in structure	6	0.34%
50 or more units in structure	0	0.00%
Mobile home	562	29.94%
Boat; RV; van; etc.	0	0.00%
Median number of rooms		5.60

House Heating Fuel	Number	Percent
Total Occupied Housing Units	1,718	100.00%
Utility gas	180	10.47%
Bottled; tank; or LP gas	552	32.11%
Electricity	964	56.15%
Fuel oil; kerosene; etc.	0	0.00%
Coal or coke	3	0.15%
Wood	19	1.12%
Solar energy	0	0.00%
Other fuel	0	0.00%
No fuel used	0	0.00%

Telephone Service	Number	Percent
Total Occupied Housing Units	1,718	100.00%
Telephone Service Available	1,657	96.49%
No Telephone Service Available	60	3.51%

Vehicles Available	Number	Percent
Total Occupied Housing Units	1,718	100.00%
No vehicle available	78	4.56%
1 vehicle available	513	29.84%
2 vehicles available	731	42.55%
3 vehicles available	256	14.89%
4 vehicles available	82	4.79%
5 or more vehicles available	58	3.36%

Plumbing Facilities	Number	Percent
Total Housing Units	1,876	100.00%
Complete plumbing facilities	1,863	99.34%
Lacking complete plumbing facilities	12	0.66%

Kitchen Facilities	Number	Percent
Total Housing Units	1,876	100.00%
Complete kitchen facilities	1,869	99.64%
Lacking complete kitchen facilities	7	0.36%

Rating and Issues – 200

Criteria	Rating
Impaired Water Bodies	1
ADEM Basin Assessment Rating for NPS Potential	5
NRCS Priority Watershed	1
AWW Water Quality Monitoring and Results	5
Use Classification	5
Land Use Character	5
Potential for Silviculture	4
Sediment Loads	5
Animal Density	1
Soil Suitability for Development	2
Growth Rate of County	4
Increase in Traffic Volume	2
Number of Permitted Dischargers	2
Presence of Hydroelectric Dam	5
Housing Density	5
Septic System Density	1
Number of Endangered Species	5
2000 Unemployment Rate	3
Total	**61 High**

With a rating score of 61, the Taylor Creek watershed is considered to be a high priority watershed in the Lower Coosa River Basin. For more information on the watershed rating and ranking system, refer to the *Lower Coosa River Basin Management Plan*, Part IV, Chapter 12: Priority Watersheds.

A total of 23 issues were identified in the Lower Coosa River Basin. Of these, 11 are present in the Taylor Creek watershed, of which five are basinwide issues and six are regional issues. The focus of the regional watershed management measures for this watershed is managing growth and development pressures and mitigation of stormwater runoff and sedimentation, and protection of aquatic habitat.

Refer to the Lower Coosa River Basin Management Plan, Part IV, Chapter 14: Water Quality Improvement Strategy for management measures that may be implemented in this watershed.

Basinwide Issues:
- Endangered Species
- Lack of Water Quality Trend Data
- Illegal Dumping
- Lack of Education and Awareness
- FERC Relicensing of Hydroelectric Facilities

Regional Issues:
- Compliance with the *Recovery Plan for the Mobile River Basin Aquatic Ecosystem*
- Designation as a Critical Habitat
- Growth Rate and Urban Development
- Agricultural Runoff
- Urban Runoff
- Sedimentation