



STRATEGIC PLAN

for the Sustainability of West Virginia Forests

**Prepared at the Request of the
West Virginia Forest Management Review Commission**

Strategic Plan for the Sustainability of West Virginia Forests

**A Summary of Committee Deliberations and Recommendations
on 12 Major Topics Relevant to the Sustainable Management
of West Virginia Forests**

**Prepared at the Request of the
West Virginia Forest Management Review Commission**

**These Recommendations Are Based on Inputs
from 67 Land Management Professionals & Specialists throughout West Virginia**



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August 10, 2010

Mr. Randy Dye
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Dear Randy:

We have read the final version of the rather massive Strategic Plan for Forestry in West Virginia that your division and FMRC labored on all through the past year. It seems to have been worth the effort.

We are especially pleased that we jointly seem to have been able to bridge the gap between economic use and political use. With forestry this has always been problem because the political cycle of two and four years does not blend easily with forestry which requires planning decades in advance.

The FMRC wanted this plan to be practical and so asked that a cross section of industry, consultants and agency foresters make suggestions. We believe this was well done. Not everyone was satisfied, but it's a good beginning. It certainly has a different tenor than the National Forest report of a couple of years ago that essentially skirted professional forestry and timber harvesting.

As has been said about coal and oil and gas and is also true for timber, planning, preparation and pragmatism - hallmarks of good business management - are not characteristics typically associated with natural resource policy decisions. All too often policy makers wait until disaster looms before taking action. We, as legislators, see this every day and we are trying to get it corrected.

Mr. Randy Dye
August 20, 2010
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And that raises an important issue that many don't like to hear. Using trees is a good thing. Wood consumption is linked to economic development which is linked to wealth creation. With nearly 80% of West Virginia being forested, we must cut trees and we must practice good professional forestry in order to have sustainable yields and a good future for the state.

We realize that no single report or plan can be truly comprehensive and remain readable. We do, however, believe that this report comes close. We would like to see this report printed, as was the one that the FMRC helped with in 1998, for distribution of the state's forest industry and policy makers and to the forestry agencies in the other states.

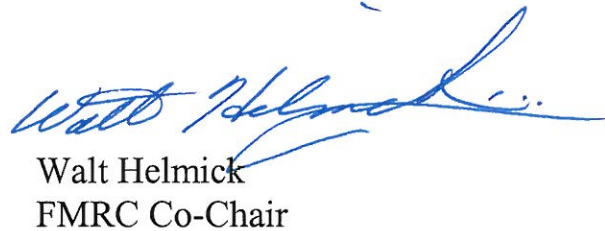
Thank you and your agency, your many collaborators and everyone else that had a part in this useful and important exercise.

Sincerely,



Harold Michael
FMRC Co-Chair

HM/WH/mjd



Walt Helmick
FMRC Co-Chair

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Introduction

The Legislative Forest Management Review Commission (FMRC), in a letter from the Co-chairmen on October 12, 2008, asked the Director of the West Virginia Division of Forestry (WV DOF) to initiate work on a Strategic Plan for Forestry in West Virginia (Appendix A). This suggestion followed the passage of a FMRC Resolution by the West Virginia Legislature entitled "A Commendation for Professional Forestry in West Virginia" (Appendix B). The Director, on October 29, 2008 formed a strategic plan committee comprised of 12 subcommittees to assist in the preparation of a document that could serve as a guide for the ensuing 15 years. The subcommittees, comprised of 67 experts, including several foresters from the WV DOF as ex officio members, met on November 21 in Charleston, outlined the topics and had preliminary discussions. During the next three months, they discussed the initial subjects, added biomass since it was much in the news and had attracted the attention of the Governor, and the Chairman or a designated person from each committee prepared position papers which were thoroughly scrutinized and amended at a February 2, 2009 meeting. These summaries were then used as a basis for discussion before the FMRC at the monthly Legislative Interim Committee Meetings of 2009. The final committee step was to edit the summaries into a common format, submit the results a last time to the originating subcommittee chairman (March, 2010), prepare an executive summary, assemble explanatory appendices and submit the plan for publication by the FMRC.

The final product contains 73 Issues, 78 Goals, and 204 Proposed Actions assembled in 12 overall topics related to increasing hardwood production in a sustainable manner while balancing economic, environmental and social imperatives.

Many of the issues are similar or identical to the 12 goals of the strategic plan of 1988. However, due to a lack of funding, unsuccessful prioritization of efforts and lack of interagency cooperation nine of the earlier goals have not been accomplished. The other three are outstanding success stories.

Unforeseen factors could affect the future timber supply. However, if this plan is followed, none should seriously cripple the contemplated industry, although emotional buzz-word (unscientific) management procedures i.e., man-caused global warming, biomass utilization urgency, acreage conservation, etc. will need to be constantly balanced, especially if there is a rising political trend towards using wood for conversion into bio-energy.

During the study, an effort was made to acknowledge cooperative efforts of federal and state agencies that share overlapping responsibilities for forestry related activities in the State and to discuss prospective assistance in facilitating further development (Appendix C). A brief glossary of important forestry terms helpful in understanding this plan (Appendix D) and an outline guide for preparing a sustainable forestry management plan (Appendix E) are also appended.

The committee opens the strategic plan with three short sections that discuss historic data thought necessary as background for general consideration and understanding by the many types of readers that it is hoped will take the time to peruse this plan.

Executive Summary

ABSTRACT

Commercial timber production is the most important economic and social use of the state's timber resource, but it is just one of several historic direct and indirect uses, i.e., wild land recreation, wildlife production, watershed protection, tourism development, wilderness set asides, rural housing etc. Better management will overcome anticipated detrimental effects on production goals while still providing for these entities. This strategic plan contains objectives for the management, improvement and renovation of West Virginia forests, discussions of needed research, suggestions on how to better transfer modern management and technology to the landowners and industrial components, how to improve the use of up-to-date information in forest policy development and how to improve techniques for continual dissemination of up-to-date forest management information.

Although global demand for a wide range of forest products is increasing, the involved experts believe the best opportunity for West Virginia producers is to continue to produce high grade hardwood timber on a sustained yield basis for domestic and foreign markets. A common theme deduced from the subcommittee reports is that intensive management by professional foresters along with the proven ability of wood technology to continually stretch the timber resource have probably been underestimated. Consequently, forestry, as an industry, can continue to occupy its place as the most widespread and one of the most important industries within the state, but there is a lot that needs to be done if the industry is to produce in the maximum sustainable manner needed to insure the future economic and social health, stability and vitality of the state.

A summarization of the discussions used to prepare this report indicate that the continuation of the industry at current decadal levels will involve the investment of an additional approximately one and one-half million dollars over each of the next 15 years to provide educational materials for landowners and to develop and implement techniques for the restoration of damaged lands.

It is important that the Director of Forestry immediately organizes committees to plan for the use of specific finances made available for implementing the elements of this plan including tabular outlines for mandatory semiannual reports to the FMRC to show how the suggested expenditures, once provided, are reaping benefits for the state. It is also important that the Division of Forestry be empowered by legislation and finances to carry out this plan, the implementation of which will improve competitiveness with adjacent states, provide for the protection and enhancement of both the direct and indirect amenities provided by forests and will insure sustainability for future generations. There is no need for finger pointing as to why this is not already happening. West Virginia is a young state in regard to forest rotations and professional forestry did not exist for four fifths of its first century and was limited for half of its second. Research and observations have now provided much of the data necessary for profitably managing the state's most widespread natural resource in a sustainable manner that will greatly improve the economy for present and future generations.

Background:

For nearly three centuries, the forests of what is now West Virginia have provided both direct and indirect benefits to the people living in or near them (Appendix H). At first they were an obstacle that had to be conquered and removed to make way for cabins and fields. Later they provided materials for the building of railroads and communities as the frontier pushed ever westward. During the 20th Century, efforts were initiated to professionally manage forests for greater yields, to protect the soil and water and to provide wildlife habitat. As the population has increased, social and economic pressures on the forest resource have also increased. In the modern world, international pressures have both created and destroyed markets, various noxious insects, i.e. Gypsy Moth, and tree disease pests, i.e. Chestnut blight, have been imported, a lack of ecological design of timbering operations has changed and is changing the forests species composition, housing and industrial developments have and are changing land use and emotional responses to nonscientific environmental scares, often initiated by activist groups and fueled by media misrepresentations and lack of knowledge, have sometimes resulted in political policy decisions overriding professional judgment which has resulted in improper management which has eroded the public perception of forestry as a science-based industry.

It is with these factors in mind that the FMRC asked for a critical examination of forest policy in West Virginia with suggestions for the future. This plan will not solve all problems, but, if funded and implemented, it will greatly improve the practice of forestry in West Virginia. Discussions by the committee resulted in issues, goals and actions that will establish the basis for promoting and improving the conservation and sustainable use of the state's forest resource so that it can meet local and national needs for present and future generations.

The forest inventory is the core item of any sustainable forest management plan as it enables the forestry professional to determine harvest rates that will achieve long-range sustainability. This is vital to statewide policy planning as well as for management plans for individual properties. The drafting of a sustainable forest management plan requires an understanding of forest ecology and species replacement processes as well as a thorough understanding of professional forestry, especially silviculture (Appendix E). It is clear that one type of management does not fit all of the ecological variables that exist across the state.

Overall Decisions:

The experts that produced the subcommittee reports were unanimous in their belief that excellent forestry can only come if policy makers, advocacy groups and the public are thoroughly educated on the practical aspects of forestry. This has not been a high priority topic for the state division of forestry, the cooperating U. S. forest service, the industry trade association, or the colleges and universities teaching forestry. Because of this vacuum, forestry issues are often addressed in responses to crises such as catastrophic wildfire, endangered species concerns or global price setting or even to manufactured crises such as timber harvest caused flooding with attendant wide swings in political motivations and activities.

The experts were also in accord that forest managers must now balance more diverse resource objectives than ever before. A common refrain was that modern, sustainable forest management has evolved from timber supply and plentiful game to more integrated land use planning with unequal concern for social, economic and ecological dimensions. Consequently, the research of today has to be translated into a vision for tomorrow. What are the future conditions and ecosystem responses that might result from hastily made policies of today, especially those erroneously geared to political correctness or current self-interest? Will the ecosystem react as did the stand where the research was conducted? No one can be certain. It may take 100 years to get the answer. Thus short term reasoning may completely destroy the forest for the future. Models, based on assumptions, can be constructed that will extrapolate some results several rotations in the future, but they are mostly useful for production-oriented forestry; they fall short when dealing with key ecological processes such as succession and natural disturbances. Consequently, models cannot be relied upon and in no way replace documented history and experience. The alternative is to have well trained professional foresters who can constantly monitor the various situations, i. e. allowable clear cuts, and make immediate adjustments when the facts justify a change. Professional manpower is the only way to insure that management decisions are ecologically viable, economically feasible and socially desirable.

The experts also discussed the role of forestry in the West Virginia economy and seemingly decided that it is not what it should be. Forests are found in every county and are the most wide spread natural resource in the state. It is scientifically acknowledged that good forest management that will continue the current forests into the future while providing wood for the economy is also the management that simultaneously provides the wildlife for hunting, the aesthetics for everyone's enjoyment, the basis for tourism, the main entity in soil protection, and importantly the preservation and continuation of the thousands of organisms in the forested environment, some of which have not been studied or even named. Over the years, agency turf building, through political decree has fragmented the field into specific disciplines that sometimes do not have the same long range goals and may actually be harmful to forest sustainability.

Specific Issues:

The inventory subcommittee settled on six issues, none of which are absolutely new, but all of which are rapidly coming to the forefront.

The biggest suggested change is to cooperate with the USFS in redesigning the state's timber inventory. As currently conducted, the statistics are broken into three geographic units with county breakdowns in each. This has worked well, but the need to consider the resource from environmental and watershed standpoints necessitates that the statistics be broken into the five natural physiographic provinces. Preliminary discussions with the USFS indicate that this can be done in time for the 2010 release.

Another long term problem is the use of four different volume measurements when selling and/or inventorying timber. The suggestion is that one scale be adopted as the standard for the state. Currently, the federal government uses cubic feet or the International $\frac{1}{4}$ " scale, the state and many consultants use the International $\frac{1}{4}$ " and the mill industry still uses the Doyle, which averages about one-fifth less than the International $\frac{1}{4}$ ".

Most of the other issues relate to the need for additional statistics and the timeliness of statistical releases. The various suggestions ask for special overall releases at least annually, the need for a semi-annual harvesting report providing the area where conducted, the board foot volume by areas, the use of BMPs and whether reproduction has been provided for in advance, relative changes in ownerships and the forested acreage withdrawn for other uses. One issue suggested the development of possible uses for noncommercial forestland.

The taxation subcommittee identified eight issues. Most involved perennial problems. It is suggested that the State Code be amended to better define what is a farm woodlot and relate this to the \$500 severance tax credit; to study and report how lands under the Managed Timberland Tax Incentive Program are approved, valued and monitored at the state and county levels; to review and report how federal tax law changes have resulted in large ownership changes in the state; to review and report on the current ways the federal government reimburses counties for the property taxes lost on federally owned property; how Class II property that is commercially timbered is reclassified as Class III and the need for revision of the Moss Report on the taxation policies of timber harvesting in the neighboring states in relation to West Virginia.

The primary forest industry subcommittee identified seven issues dealing with logging, trucking and the public image of timber harvesting. It is suggested that a positive profile of the state showing the attractiveness of the state towards the primary forest industry be developed; a circular on logging skills and workshops be prepared; a series of publications be developed to indicate bridge weight problems in the state for use in developing management plans and suggested techniques for complying with the weight limits; the development of a weekly report to keep the public aware of the value of forestry to the state; the distribution of a quarterly report on mills, timber species and volume needed and probable prices; and the forest stewardship committee to suggest and monitor classes thought to be needed for foresters and loggers. Other suggestions involved the establishment of a free forestry speakers bureau and information to be made available periodically on third party certification and how it is monitored in regard to the sustainability of timberlands.

The secondary forest industry subcommittee identified 10 issues. It is believed that an illustrated brochure showing the extent of the industry in the state would be well accepted and could be used to show the competitiveness of the state in attracting secondary manufacturing facilities. The availability of sites near the resource could also be included. A primary question is whether the state is willing to become competitive in the way of taxes, regulations and other aspects of the business climate. Discussions centered on reporting the success of the secondary industry in West Virginia, ways to broaden markets, improve customer relations, strengthen definitions, organize help for new industries, develop data on energy prices, suggest new truck weight regulations, and publicize current tax credits.

The forest ecology subcommittee reviewed the many aspects of plant and animal biology and how the interrelationships are germane to all silvicultural and conservation activities and noted that all of the subcommittees have recommendations that involve ecology. After sorting through the several ways that the needed information can be collected and distributed, the committee recommended that permanent demonstration-teaching areas be established in each of the state's physiographic provinces and sub provinces, that descriptive information be prepared and that these be used as centers for hands-on teaching.

The dangerous factor subcommittee identified 8 issues. In brief, it recommended an intensification of activities regarding forest fire detection and suppression with the idea that fire induced decay is probably the greatest cause of mortality in the state's forests. The subcommittee also reviewed the current need to strengthen educational activities dealing with invasive exotic pests, minimize the adverse effects of the gypsy moth, greatly increase activities related to pests such as the emerald ash borer and the hemlock woolly adelgid which have the potential to remove these trees from the forests much as the chestnut blight once removed the American chestnut, institute cooperative studies leading to the control of overabundant game animals, and institute studies on how to better administer the overall forest insect and disease survey and control programs.

The reclamation of damaged lands to forestry subcommittee used six issues to explain the need to revitalize forestry on lands damaged to forestry, mining and highway construction practices. It suggested starting by developing an inventory of such lands, deciding on an approach to revitalization, gearing up to produce seedlings from high quality native stock, suggests that questions be added to the timbering notification form to insure that landowners have evaluated possible environmental damages, assessing whether past mining reclamation that returned lands to grass can be replanted to hardwood trees and, if so, evaluate whether such a practice would be a negative or positive economic practice, and reviewing past suggestions on aerial seeding after hot forest fires to rapidly establish vegetative cover.

The urban forestry - land management and tourism committee centered on six issues. Chief among these is that the citizens in general and their public officials at all levels are not well informed as to what urban forests are or do and can do to enhance everyday life and suggests several steps to remedy the situation through providing better information and in assisting the West Virginia Urban Forest Council, especially with well written Best Management Practices. Other issues involve projects to assist the Chesapeake Bay Initiative, work with native and exotic pests and emphasize that urban forests are important to tourism efforts.

The regeneration of forests subcommittee reiterated that the overall percentage of oak timber in West Virginia forests is declining and that the percentage of yellow poplar and red maple timber is rising. This is probably due to high grading and to logging practices in general that are conducted without first providing for advance reproduction. The overabundance of deer was also cited as a problem as is the fact that approximately four-fifths of all acorns are weevil infested. It was suggested that a condensed summary of silvical data be prepared in field guide format for land managers to use in their work and plan preparation, that comprehensive workshops be conducted to show how the information can be used and that the public be continuously educated on this very important part of forestry. One example used in the discussions concerns the increasing numbers of red maple and attendant problems as research has shown that decay in red maple averages from 13% in 12-inch trees to 46% in 24-inch trees. Only American beech and black birch are more defective. In contrast yellow poplar and white oak average only 4 percent decay.

The silviculture and tree marking guides subcommittees' reports were combined in the final version of the strategic plan. A total of eight issues were identified. The lead issue suggests that West Virginia forests are a bit different from those of the surrounding states in that the physiographic provinces differ from east to west and also according to elevation. In addition, West Virginia is small in contrast to the others, is extremely mountainous, is lightly populated and although 78 percent forested, the industry plays a small role in the overall economy. This seems to be little understood by

various federal agencies that believe one size can be used to fit all situations. This is seldom true when working with nature. Consequently, the past is replete with what are now seen as mistakes. The primary suggestion is to prepare a single manual that will describe and illustrate good silvicultural practices in each of the physiographic provinces, strengthen the need for a written plan on each property to be a criterion for tax subsidies, investigate the economic differences of the original white pine tracts vs. the hardwood now growing there, identify the need for a written harvest plan before harvesting is conducted, develop growth statistics for all merchantable species on each aspect and soil type, and produce an illustrated manual providing guidelines for cut and leave decisions in marking merchantable trees for harvest. There was also discussion as to what should be included in a forest management plan and for what duration the basic plan should be prepared. (Appendix E)

The forest management and wildlife subcommittee identified three issues. Chief among these was the decline in oak species, the need for concise written information showing the positive and negative interrelationships of wildlife and timber management and a lack of guidelines identifying good wildlife habitat and its maintenance.

The usefulness of wood biomass subcommittee delineated six issues. It was agreed that the presence of surplus biomass in relation to ecologic and current industry needs should be evaluated and the results popularly distributed, that the additional cost of removing top wood with the logs in harvesting should be evaluated and that the positive and negative environmental effects of additional biomass removal for cogeneration and other uses be documented. It is obvious that biomass in West Virginia cannot be procured as easily as it can on less steep terrain and from monoculture forests such as exist in the South.

Issues, Goals, Strategies, & Actions

**Summary of State Forester's Report to FMRC
on Forest Inventory in West Virginia**

REPORT TO THE WEST VIRGINIA LEGISLATIVE FOREST MANAGEMENT REVIEW COMMISSION ON THE
SEVERAL YEARS IN THE MAKING BUT NEARLY COMPLETED INVENTORY OF WEST VIRGINIA FORESTS.

Interim Committee Meeting, December, 2008

As we discussed at the November Interims, the Division of Forestry has brought forestry technical experts, forestry land managers and government officials together to answer the questions you have posed. At the end of the process, the answers will be the basis of a new strategic plan that will ensure that West Virginia forests are handled economically and environmentally while guaranteeing sustainability.

The highlights of this year long study will also be detailed in the forest stewardship bi-monthly workshops, now in their eighth year, held for division staff, consulting foresters and other professionals interested in forestry's physical, economic, cultural and recreational values which are all a part of sustainable forest management.

In lining up the specialists to assist in answering your litany of questions, the Division has found there is quite a spirit of cooperation and a willingness to help plan for the next generation of forest management.

We are working from the natural diversity of forests and we are preparing reporting systems to give year by year updates. We are working hard on the positive aspects. You will hear more about this later.

The Division's primary responsibility, as we see it, is to encourage the wise use of our commercial forests and to encourage private forest owners to manage and exercise stewardship of their forested lands. As part of this, the Division of Forestry will do whatever is possible to protect their forests from catastrophic events, things like fire, insects and diseases.

We believe that the single most important job of the professional forester is planning. Planning, of course, requires prediction. We use a cooperative forest inventory, prepared primarily by the USFS's FIA unit (Forest Inventory Analysis) as our basis for planning. Unfortunately, the results have not been widely circulated. A second problem is that even foresters do not interpret the data accurately. These shortcomings will be solved, we hope in a way that will provide social, economic, political, environmental and other user disciplines data they can use and be happy with. Many groups are happy when we release tolerably accurate predictions for the next five or ten years. Foresters, however, do not have this luxury. They must make 50 to 100 year predictions of the outcomes of their decisions on an almost daily basis. Now that we are committed to sustainable forestry, we must predict over several, not just one, rotations. We will talk more about that in the coming months.

Finally, before getting to the numbers, we want to emphasize again that the science of forestry is in a continuous upgrade. Great progress has been made through key recommendations of the strategic plan your commission mandated and published some 20 years ago. New and better techniques are now available and society's changing attitudes towards the out-of-doors, hunting and fishing, mechanized travel and aesthetics have all brought changes.

Let me caution, however, as I read the other day, "that we are living in a generation of unparalleled personal freedom, individual rights, political correctness and a desire by individuals for self-gratification. Whoever said this first probably decided that some of it was unsustainable. Included in this climate of social behavior and expectation is the concept that nature should always be beautiful and should conform to our personal or our group's paradigm – our imaginary "Garden of Eden." This generation has several such self-indulgences, many of which are non-sustainable and some of which are negative for the environment and for what we will pass on to future generations." A second caution is that we must rise above the rhetoric and scientifically inaccurate assertions so often used by activists to politicize environmental discussions. A forested ecosystem is not like a photograph that can be framed and hung on the wall unchanging for all time. Forestry is conservation; setting aside is preservation. The words are not synonymous. In many cases, the setting aside guarantees that the values thought to be preserved will be lost. Forests are constantly changing; they can't be kept the same in perpetuity.

These misjudgments must be replaced by a true respect for nature. Sustainable forestry is not just about maintaining the supply of raw materials and jobs. It is also about maintaining the functioning of the global ecosystem. But sustainable forestry must be concerned about people and their needs. It cannot focus only on environmental issues such as wilderness, biodiversity and old growth.

One thing coming from the new inventories is evidence that West Virginia remains the third most heavily forested State, behind only Maine and New Hampshire. In planning, however, we must remember that West Virginia is a very small state, only 41st in size and very topographically and ecologically varied.

The USFS inventories began just after World War II and have continued at approximate 10-year intervals. The first report on West Virginia came out in 1950, with others in 1964, 1976, 1988 and 2005. The first few took a tremendous amount of calculator hand work and the results were rather crude. The advent of the electronic computer has helped greatly and each decennial report is presented in greater and better detail.

The first county-by-county statistics were in the 1988 report, the result of a special financial contribution by the West Virginia Legislature at the request of the FMRC. The current technique is to revisit about 20% of the permanent plots each year. This means that we can spot trends early. We will cover the entire state each five years and report on the whole at the end. We have a permanent plot for each approximately 6,000 acres of forestland. In addition, 20 plots for each permanent plot are measured from aerial photographs. (The survey utilized 50,000 aerial photo plots in the 1988 inventory.)

The forest symbolizes West Virginia. West Virginia covers approximately 15.4 million acres. Of this total, about 11,600,000 acres can be considered commercial forestland in that it will grow 120 board feet (20 cubic feet) per acre per year and the land is available for harvest. (A board foot is a piece of

lumber 12 x 12 inches and one inch thick.) Units of less than 10 acres, approximately 3 percent of the total, are usually uneconomical to harvest. It costs as much to “set up” on a small as a large acreage.

This leaves 11,157,000 acres of which at least 1,560,000 acres or 14 percent of the total is government owned or under long-term lease. Government land includes the entire Monongahela National Forest of 919,000 acres and part of the George Washington (113,000 acres) and Jefferson (21,000 acres) National Forests.

Other major government land owners or managers include the Corps of Engineers (109,000 acres around major impoundments), Division of Natural Resources (138,000 acres), Division of Forestry (71,000 acres), other government county, municipal and educational (46,000 acres), another 493,000 acres is off limits to timber harvesting via congressionally imposed “wilderness” areas, State Parks (77,000 acres), land bordering wild and scenic rivers, another congressional edifice (67,000 acres), and conservancy groups (18,000 acres).

In general, since the 1988 survey, West Virginia forests have increased approximately 22 percent. Thus, our forests are growing more than we are harvesting. Much of this increase is in the upland or Appalachian highland section of the state where the growth increase is nearly double that of the rest of the state. This is because there has been little use of the Monongahela National Forest as a timber source. The overall allowable cut on this forest was calculated years ago by the USFS for Senator Byrd at nearly 200 million board feet per year. In 1997 the cut was less than 6 million board feet and the predictions for 2009 are about the same. This area has much of the high value cherry, sugar maple, and prime red oak found in the state (Appendix K).

Let me again emphasize that the role of the Division of Forestry is to work for the overall intelligent use of our forests for the environmental, economic, social and cultural well-being of all West Virginians. Our tools are knowledge and cooperation and our ultimate goal is healthy forests for future generations.

We believe that strengthening the stewardship ethic among forestland owners, both private, and commercial and governmental, will contribute to sustainable forest management. Foresters must manage and landowners must allow them to manage with emphasis on the creation of the newer stands that replace the ones we cut. All too often the result of unplanned harvesting is degraded merchantable stands with little valuable regeneration instead of the nice stand of Allegheny hardwoods growing at reasonable growth rates and densities that should be there.

Lest I be misunderstood, let me reiterate that private forest owners do have land rights including determining the objectives for which their forests will be managed. These rights, however, do carry a public responsibility to manage them as an integral part of the overall rural landscape including preventing their destruction.

We will have the total package of statistics from most recent inventories in publishable form before long. The field work which has taken the better part of two years, is all done, but instead of reporting on an arbitrary split of the counties into three units as in the past, new computerization by the Forest Service is allowing us to present the statistics by natural ecologic units. Instead of the northeastern, southern and northwestern areas, we will have the eastern ridge and valley (middle

section of the Valley and Ridge Province), the upland or Appalachian Mountain (the excluded area of the high mountains, the Cheat River System and the headwaters of the North branch of the Potomac) and the Kanawha section of the Appalachian Plateau province (the Ohio River drainage with the exception of the Cheat River drainage and some of the headwaters of the Kanawha-New system in the high mountains north of White Sulfur Springs). It's also possible that the breakdown might be to five units, as has been suggested by some at West Virginia University. In any event, there will be a much better breakdown, although technically all three (or even five) are part of the Appalachian Highlands of the eastern United States (see map – Appendix G). The vegetation is classed as central hardwood forests in the Kanawha section, northern forests in the Alleghany Mountain section and chestnut and oak forests in the Valley and Ridge province. Each is further subdivided into forest communities.

This new summarization will collate the major commercial species into more natural growth units and should assist greatly in managing the state's forest ecosystems for sustainability. We will have total cubic feet and board feet by species and diameters, those suitable for timber and the percentage that is not, the overall biomass in tons, averages by acres, averages by ownership, etc.

A few draft tables summarizing the overall data for the state are appended (Appendix J). These are draft versions and are not yet ready for publication. The USDA's FIA unit's computers are chugging along and we will have a final report with statistical error percentages before too long. We will report the progress as we move along with answering the other questions, but the final report may be a few months away.

1. Forest Inventory in West Virginia

The Forest Inventory Study Group identified a total of 6 issues.

ISSUE 1-1: The USDA Forest Inventory and Analysis (FIA) data summaries for West Virginia have historically been reported by three arbitrary geographic/political regions. These regions include groups of counties found in the southern, northeastern, and northwestern parts of the state. This type of reporting is an obstacle to planning sustainable forest management because it does not adequately account for the underlying geological and ecological factors that affect forest growth and species composition within the state.

An alternative approach is to report inventory data summaries by major physiographic provinces found within West Virginia. This approach would group the inventory data according to areas with similar soil types and landforms without regard to political boundaries. Such an arrangement would make forest management practices more effective in sustaining West Virginia forests because regeneration, growth, and species composition would be more predictable and thus more consistent within a physiographic region. A change to delineation by physiographic region will also result in better guidelines for landscape scale forest management decisions that may involve wildlife communities.

Three major physiographic regions occur within the boundaries of West Virginia: 1) the Unglaciaded Allegheny Plateau Section of the Appalachian Plateau Province, 2) the Allegheny Mountain Section of the Appalachian Plateau Province, and 3) the Middle Section of the Ridge and Valley Province (Appendix G).

GOAL: To begin reporting West Virginia forest inventory statistics according to the physiographic regions and sections found within the state's boundaries (Strausbaugh and Core 1952; Hicks 1998) (Text Fig 1).

PROPOSED ACTIONS:

1. Request the USDA FIA unit to re-analyze the inventory statistics along established ecologic boundaries instead of just counties and to publish the reanalyzed data in the planned 2009 decennial inventory.
2. Develop a fact sheet discussing the diversity of forests by eco-regions.
3. Determine whether a breakout of statistics by economic development regions, as was done in 1990, would be of assistance.

LEAD ORGANIZATION: WV DOF

SUPPORT ORGANIZATION(S): USDA FIA, WVFB, NRCS, WVU DFNR

TIMELINES: To be completed December 2010 – July 2011.

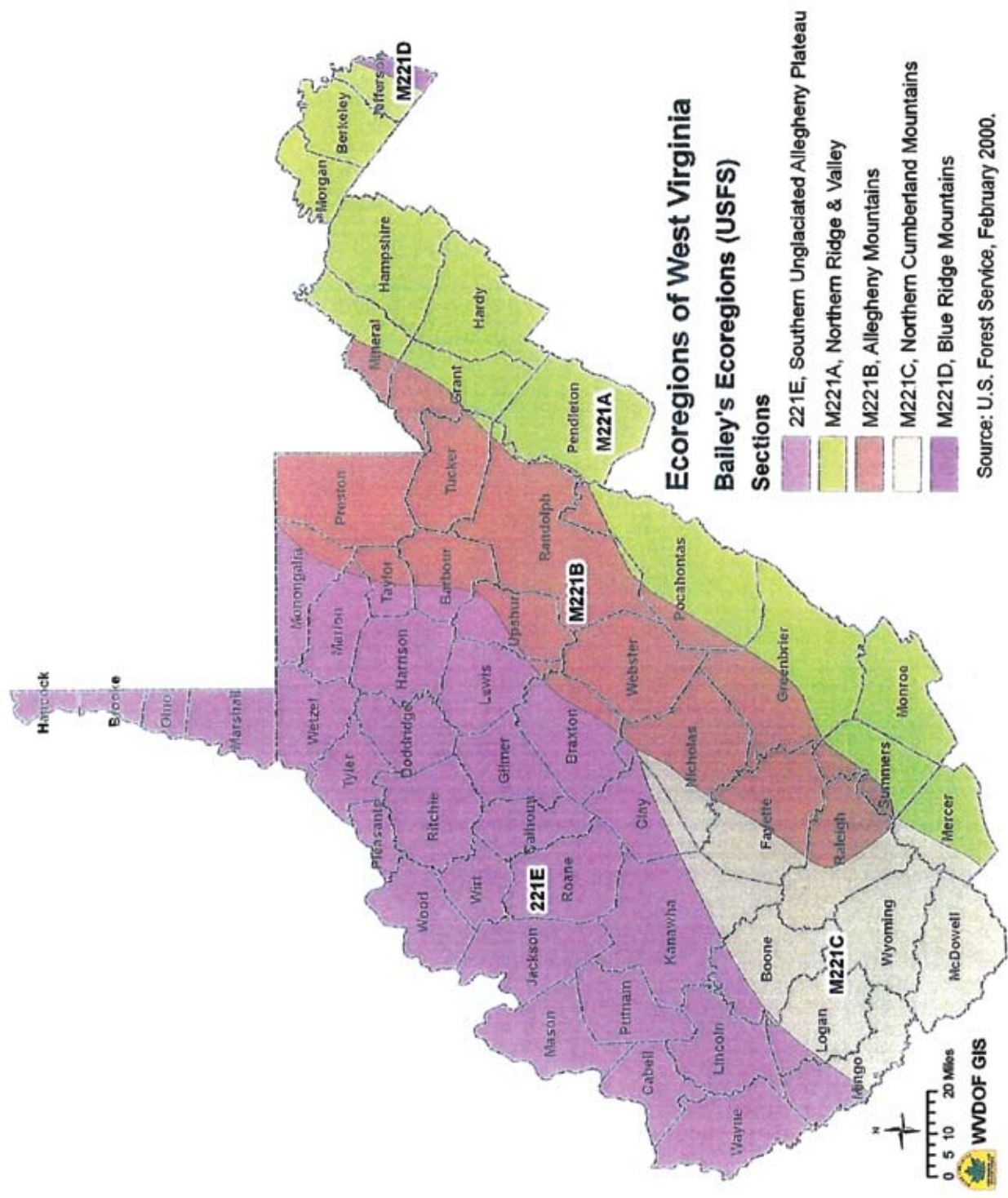
COST: To be developed by WV DOF when needed.

MEASUREMENT OF SUCCESS: Publications issued as suggested above.

REFERENCES:

Strausbaugh, P. D. & Earl L. Core. 1952. Flora of West Virginia – Vol. 1. W. Va. Univ., Morgantown, WV. (4 vols. 1075 p. completed 1964).

Hicks, Ray R. 1998. Ecology and management of central hardwood forests. John Wiley and Sons. New York, NY. 412 p.



Ecoregions of West Virginia
Bailey's Ecoregions (USFS)

Sections

- 221E, Southern Unglaciated Allegheny Plateau
- M221A, Northern Ridge & Valley
- M221B, Allegheny Mountains
- M221C, Northern Cumberland Mountains
- M221D, Blue Ridge Mountains

Source: U.S. Forest Service, February 2000.

ISSUE 1-2: The federal government, state government, individual forest consultants and timber purchasers use different scales and ways of measuring timber inventories. Thus, they are seldom compatible and the differences aren't always recognized.

Most of the timber sold in West Virginia is to mills that use the Doyle Scale. This scale greatly underestimates the board feet of lumber that can be cut from a tree or log up to about 34" in diameter. The US Forest Service uses the International 1/4" scale which is much more accurate, but still underestimates the overall volume as most mills now have 1/8" saws. In between is the Scribner Decimal C. It is impossible to convert directly from one to another with accuracy as each tree or log would have to be measured. Overrun may run as high as 40%. Also some agencies use cubic feet to avoid the confusion.

The overall biomass that is not converted into boards, bark, sawdust, edgings, is not measured in the above calculations. Another error is that tree species differ in taper which intercalates another error unless this has been built into the volume tables being used.

Another item not considered in overall volume estimates is the percentage of veneer that may be present. There is no average statistic as the veneer ratio is higher for some trees than others. As examples, black cherry may be as high as 30% while red maple may be 1% or less. Foresters often use the estimate of 5 to 7% of the basal logs being veneer.

There are also differences when timber is measured while a tree is on the stump vs. measured after being cut into logs vs. being measured after being cut into logs and graded for defect.

GOAL: Work to get all volume measurements reported on the same scale.

PROPOSED ACTIONS:

1. The WV DOF to consider using and recommending the International scale as does the federal government.
2. Prepare and distribute fact sheets explaining the differences in scales and how values are affected.
3. Teach this as part of the landowner seminars with actual examples using hands-on techniques.
4. Urge the adoption of an official scale for West Virginia.

LEAD ORGANIZATIONS: WV DOF, WVU DFNR, USFS Research

SUPPORT ORGANIZATION(S): WVFB, NCRS, WVFA

TIMELINES: Have plans in place with the first examples by December 2010.

COST: To be developed by WV DOF as needed.

MEASUREMENT OF SUCCESS: Actions satisfactorily completed.

ISSUE 1-3: The public is not regularly provided relevant inventory information that would allow it to participate effectively in political and policy decisions regarding forestry.

Policy decisions, such as tax issues, that will influence the overall timber industry are often being debated, but those affected do not have the data necessary to respond. It is often too late after the policy change has been enacted. The winner is usually the interest group with access to the necessary data; the loser is the landowner.

GOAL: Provide semi-annual summaries of timber inventory conditions, including harvest volumes by species and district within West Virginia.

PROPOSED ACTIONS:

Include semi-annual summaries of harvest volumes and the number of active harvest operations and acres harvested in the stumpage price reports.

LEAD ORGANIZATION: WV DOF

SUPPORT ORGANIZATION(S): WVU DFNR, USDA FIA

TIMELINES: Have plans in place with the first examples by December 2010.

COST: To be developed by WV DOF as needed.

MEASUREMENT OF SUCCESS: Publication of summary

ISSUE 1-4: Current forest inventories do not describe the productive potential of non-commercial forested land.

GOAL: Include a description of the suitable uses for non-commercial forested land in future forest inventories.

PROPOSED ACTIONS:

Work with USDA FIA to develop such estimates for the ecological subunits.

LEAD ORGANIZATION: WV DOF

SUPPORT ORGANIZATION: USDA FIA, WVU DFNR

TIMELINES: Include discussion in 2010 statistical release.

COST: To be developed by WV DOF as needed.

MEASUREMENT OF SUCCESS: Meeting timelines.

ISSUE 1-5: There is no standardized procedure for recording annual timber harvests and the condition of residual stands.

Timber harvest reports do not summarize the relative location of the harvests and the acreage involved. There is a shortage of information on the type of timber harvest activities, i.e., the intensity and selectivity of the harvests, the percentage of volume removed, the percentage of residual stand density, the change in species composition, the relative value of harvested and residual trees, and the resulting changes in stand structure.

GOAL: To develop a set of descriptive statistics that characterizes the nature of timber harvests in West Virginia by physiographic province in an annual report.

PROPOSED ACTIONS:

Include semi-annual summaries of the above listed data in quarterly stumpage price reports published by WVU.

LEAD ORGANIZATION: WV DOF

SUPPORT ORGANIZATION(S): USDA FIA, WVU DFNR

TIMELINES: Have plans in place with the first examples by July 2010.

COST: To be developed by WV DOF as needed.

MEASUREMENT OF SUCCESS: Inclusion in quarterly price reports.

ISSUE 1-6: Current and continuing changes in timberland ownership increases the complexity of long-range forest management planning.

Timberland ownership has changed greatly in recent years. Several large publicly-traded forest product companies in West Virginia have sold their timber lands in the past 20 years. This change in ownership reflects global market changes as well as new tax laws affecting timberland. The timber tax problem was a change at the federal level created for business in general, but the overall result was that timberland ownership greatly reduced after-tax earnings for the big integrated forest product companies. The new and/or reorganized owners enjoyed more favorable tax situations which allowed the avoidance of corporate and long-term capital gains taxes.

Many of the reorganized ownerships are real estate investment trusts (REITS) and many new ownerships are either REITS or timber investment management organizations (TIMO's). Their long range plans for forest management often differ dramatically from the former integrated forest industry owners who sought to return consistent earnings to shareholders as well as provide for a sustained yield of forest products. The new owners are not necessarily concerned about supporting lumber or paper mills. Consequently, the timberland base and the projected supply of wood products within West Virginia may be subject to rather abrupt changes.

GOAL: To study and report the changes in timberland ownership patterns in the state as part of an effort to inform and assist the WV DOF in planning for sustainability of forests.

PROPOSED ACTIONS:

1. Summarize ownership patterns and make data available annually.
2. Summarize tax policies on large ownerships and make such information commonly available.
3. Clarify differences in long-range forest management plans between owners of large and small properties.

LEAD ORGANIZATION: WV DOF, WVFA

SUPPORT ORGANIZATION(S): WVFB, WVU DFNR, NRCS

TIMELINES: Have plans in place with the first examples by July 2011.

COST: To be developed by WV DOF as needed.

MEASUREMENT OF SUCCESS: Semi-annual reports.

Summary of State Forester's Report to FMRC on Taxation of West Virginia Forestland

Taxation of timberland in West Virginia revolves around the type of ownership and it is changing very rapidly in the state.

Historically, the state had large vertically integrated companies that owned land, owned mills, employed loggers and turned out secondary products. Taxes were the main problem.

In these early days, say the late 19th and early 20th century, when forestry was in its infancy in West Virginia, the state's general property tax was a millstone around its neck and the neck of every other infant industry in the state.

Total confiscation was the impending reward.

The solution for most companies was to purchase the land and trees, build the mill or mills, clear-cut and leave. This hurt both the state and the nation.

The U. S. Chamber of Commerce was acutely aware of the problem and even held a joint meeting in Charleston in 1929 to publicize it. The several speakers at the two-day session all agreed that the tax policy forced landowners to harvest and to forget about management and the future.

Passage of the Constitution Amendment on Taxation in the 1930s helped by establishing four property classes, but each county had its own idea as to the worth of timberland.

As an example of what happened time and time again, the Cherry River Boom and Lumber Company had large land holdings and a mill at Cherry Tree Bottoms, now Richwood. The narrow gauge line that served Richwood, the West Virginia and Pittsburgh was not sufficient for expanded traffic.

In 1900, the owners signed an agreement with the B&O Railroad. A standard gauge line was completed in February, 1901 and the big mill was completed the last of May 1901 and was sawing lumber in June. The machinery for the mill had been hauled over the mountains with horses. One of the histories says that that mill cost \$140,000.

The same mill, updated to electric, has changed hands four times and is now Collins Hardwoods. I'm told it has cut over three billion board feet in the century or so it has been in operation.

I don't want to bore you, but at least seven other factories in the town operated around that mill—clothespin, tannery, high grade paper, wagon hubs, Long Island kindling, flooring, broom handle and I have been told I missed two or three.

My real reason for picking this example is because I want you to know what happened to the land.

The U.S. Government had money available in the middle 1930s and since the land had mostly been cut over and the one class property taxes were excessive, a deal was struck to sell 153,000 acres

to the government, that was buying for a National Forest, for the grand sum of \$2.50 per acre. Do the math. The grand sum of \$382,500.00.

This tract of land is now the Gauley Ranger District of the Monongahela National Forest. Its worth today, valuing the land at \$1,000 per acre and the 16,000 board feet average per acre of timber at today's average price for that quality of \$500 per Mbf (lots of cherry and sugar maple veneer), is over a billion dollars (\$1,188,200,000,00). Three years ago before the slump in timber prices, the value would have been \$2 billion dollars. Currently, there are only a few people working in the vicinity. If Collins had the land and was practicing management, there would be a few hundred employees in perpetuity.

As you know, the tax laws were changed in the 1930s by an amendment to the constitution which provided for four classes of property. However, the damage had already been done and even landowners with small holdings were not actively trying to grow trees.

The attempted solution was the Forestry Amendment to the Constitution. It was ratified on November 5, 1946.

Amazingly enough, although we now use it as authority for the managed timberland program, it was not written with the current program in mind. Instead, since there were few foresters in the state at that time, only one consultant, landowners were to contract with the state for the Division's foresters to examine the land and to place it under management. The landowner would have a sustainable forest and the state would profit from the severance or yield tax.

Just the fact the amendment passed helped immensely; so it wasn't necessary to put it into effect. Assessors revalued cut over lands and before long the Korean War took the attention.

In 1982, the Property Tax Limitation and Homestead Exemption passed with a 10-year phase in. A new tax manual was prepared and the Tax Commissioner now values the timberland according to the worth of the land for growing timber which is then taxed under three categories, 1 – 2 – and 3. One is the best and three is the poorest.

The classes are based on aspect, annual management costs, etc. and the values differ between the six defined ecologic regions. The state has mapped the entire state with this in mind. And a good job was done.

Stumpage prices, an integral part of the formula, vary from year to year; so the figure used is a sliding average. Of the last five years which is prepared by dropping the fifth oldest year and adding the most recent. The Division of Forestry surveys for the prices and publishes an annual report.

On May 1, 1999, the Managed Timberland Tax Incentive, with the Forestry Amendment to the Constitution supplying the backup, became effective.

It's important to note that the value of managed timberland must always be less than timberland not under the program. The land has to be under active management. There is a 2-year window in which the landowner can develop the written management plan. The Division audits a random sample of the participants each year and prepares a report.

If the Division of Forestry determines the land is not being professionally managed or does not have a plan pointing towards sustainability, it can be decertified and a penalty can be applied.

Managed timberland must be certified in writing by September 1 of each year via the manager of the property. Currently, we have about 2.1 million acres under the Program (text Figure 2).

We have a yield or severance tax on timber in West Virginia (11-13A-3B). It puts us at a bit of a disadvantage because none of the surrounding states have such a tax. It has been at a rate of 3.22% of the value of the tree when severed and the person owning the tree at that time is responsible. The Governor is now considering a rate change suggested by the Governor.

Under our laws, a severed tree is a manufactured product the moment it hits the ground.

The severance tax was raised a few years back in order to help with the Unemployment Insurance crisis. It is now paid at the rate of 4%. If the person owning the timber trucks it to a mill and sells it, then the rate is 50% of the usual rate. If the owner takes the logs to the mill and saws them into lumber, the rate drops to 25% of the usual rate. This thoughtfully provides for the extra work that has gone into the product and the higher returns that are received.

Now, let's drop back to why vertically integrated companies are still at a disadvantage, this time a result of action by the federal government.

Georgia-Pacific, a company I worked for is one that has changed. Mead-Westvaco is still vertically integrated, but has sold a lot of land and some mills. Others are wobbling even more. Some like Webster Woodlands, the Barringer Trust, Allegheny Wood Products and others are out of the picture because they have sold their lands.

The problem is double taxation that some don't have to pay. Under the law, the firm must pay a 35% tax at the corporate level and a 15% tax when dividends are disbursed. Internationally, this makes them poor competitors. The result has been new investment organizations that escape such taxation, REITs and TIMOs. Some of the biggest landowners in the nation and this state are such firms. In fact, one TIMO in WV is now larger than the Monongahela National Forest.

The newest wrinkle on the horizon is the move towards the "Green Building" syndrome. Here, if the government using the program wants to use wood, it must be certified by a third party as coming from a forest that is being managed sustainably. Currently, there are three such programs, plus the tree farm association. The three charge rather highly for the service. The sum may not be much for those with corporate status, but it's quite a bit for the private landowners.

As you have seen, although forestry is the state's most widespread industry it has had a rough tax time for over a century. Treat it kindly.

My time is up. Thank you.

2. Taxation of West Virginia Forestland

The Taxation Study Group identified a total of 8 issues.

ISSUE 2-1: The advent of Timber Investment Management Organizations (TIMO), Real Estate Investment Trust (REIT) and Non-Governmental Organizations (NGOs) in West Virginia could have an adverse impact on nonindustrial private forest owners (NIPFs) and on state tax revenues.

TIMOs and REITs currently own and/or manage roughly 1.5 million acres in West Virginia. TIMOs don't own forestland per se; they just broker the purchase for investors and manage it under a contractual arrangement for the owners. Quite often the management contract is for 10, 15 or 20 years and a rather high short-term rate of return on the original investment is assured. In many cases, the standing timber is harvested when it is immature or sold at relatively low market prices to return a quick cash flow to the investors. In contrast, REITs do own the property, but are also under pressure to generate constant cash flows, regardless of market conditions. Owners of small forest properties may be adversely impacted because market prices are driven down by an increase in timber harvests from the TIMOs and REITs.

GOAL: To study the potential effect of changing land ownership patterns on the market prices and tax revenue

PROPOSED ACTIONS

1. Prepare a report on tax liabilities under both positive and negative forestry consequences.
2. Determine acreages enrolled, if any, in the managed timberland program and whether the certified (11-1C-11a-c) management plan for all such properties provides for sustainability.

LEAD ORGANIZATION: WV DOF

SUPPORT ORGANIZATION(S): WVU DFNR

TIMELINES: Have plans in place with the first examples by July 2011

COST: To be developed by WV DOF as needed.

MEASUREMENT OF SUCCESS: Completion of report.

ISSUE 2-2: Controversy has arisen as to the impact of the recently increased yield tax (temporary to pay down Worker's Compensation) on landowner and sawmill profitability.

The State Code of West Virginia (11-13A-3b) provides for a yield or severance tax of 3.22% of the gross value of the timber produced. An additional 2.78% was recently added (11-13V-4-c). Later (after 12/31/06), the 3.22% was dropped to 1.22% giving a current total of 4%. Under 11-13A-16a of the state code, nonresidents severing timber within the state are mandated to prepay the yield tax or to post a suitable bond. Another provision (11-13V-15-c) provides that any person purchasing logs, timber, or timber products secure a copy of the payee's current business registration certificate.

GOAL: Determine problems that are said to exist in the taxing situation and develop a paper explaining said problems.

PROPOSED ACTIONS:

Conduct a study to determine whether the yield tax increase has proven to be unsupportable and whether the decrease in Worker's Compensation rates coming from the new program is offsetting the increase.

LEAD ORGANIZATION: WVU DFNR

SUPPORT ORGANIZATION: WVTD

TIMELINES: Have plans in place with the first examples by July 2011.

COST: To be developed by WV DOF as needed.

MEASUREMENT OF SUCCESS: Distribution of a white paper examining the situation.

ISSUE 2-3: There seems to be controversy as to the definition of a farm woodlot (11-1C-3-f).

“Farm woodlot” means that portion of a farm in timber but may not include land used primarily for the growing of timber for commercial purposes except that Christmas trees, nursery stock and woodland products, such as nuts or fruits harvested for human consumption, shall be considered farm products and not timber products.

The confusion is apparently a result of changing times. In the formative years of the state, every farmer had a farm woodlot to provide logs, lumber, posts for building structures on the farm and wood for cooking and heating. In some instances the woodlots were detached from the general farm because that property was more valuable for crops and pasture. This situation occurred primarily in some of the Eastern Panhandle counties. There have been accusations that some farm woodlots are several hundred acres in size which seems improbable because of the limited use. The definition does seem to prevent the selling of timber from a farm woodlot. The question can interfere with the formation of conservation easements and with yield tax collections.

GOAL: To clarify the definition of farm woodlot as it pertains to selling wood products.

PROPOSED ACTIONS:

1. Schedule a conference with the Tax Commissioner or a designee to discuss the question and seek clarification.
2. Communicate the findings of this conference through the WV DOF to the general public.

LEAD ORGANIZATION: WV DOF

SUPPORT ORGANIZATION(S): WVTC, WVFB, WVDOA, WVFA

TIMELINES: Have plans in place with the first examples by January 2011.

COST: To be developed by WV DOF as needed.

MEASUREMENT OF SUCCESS: Release of communication by WV DOF.

ISSUE 2-4: There is a question that arises from the “personal use” exclusion provided in the definition of “timbering operation” in the Logging Sediment Control Act (19-1B-1).

This proviso is purportedly based on the “farm woodlot” philosophy elsewhere in the state code (11-1C-3-f) that means the occasional severing of timber from one’s own premises to be utilized in the construction, repair, or maintenance of structures or improvements.

GOAL: To determine the impact, if any, on yield and ad valorem taxes.

PROPOSED ACTIONS:

1. Schedule a conference with the Tax Commissioner or a designee to discuss the question and seek clarification.
2. Communicate the findings of this conference through the WV DOF to the general public.

LEAD ORGANIZATION: WV DOF

SUPPORT ORGANIZATIONS: WVDT&R, WVFA, WVFB

TIMELINES: Have plans in place with the first examples by December 2010

COST: To be developed by WV DOF as needed.

MEASUREMENT OF SUCCESS: Release of communication by WV DOF.

ISSUE 2-5: There are questions as to the mechanism for raising Class II property to Class III property when timber is sold commercially.

Is the change permanent? Can Class II land be in the managed timberland program? Who is responsible for making the change? Who has the responsibility for determining that the timber was sold commercially? Is any sale of timber automatically commercial?

GOAL: To clarify policies for Class II and Class III land.

PROPOSED ACTIONS:

1. Schedule a conference with the Tax Commissioner or a designee to discuss the question and seek clarification.
2. Communicate the findings of this conference through the WV DOF to the general public.

LEAD ORGANIZATION: WV DOF

SUPPORT ORGANIZATIONS: WVFA, WVU DFNr, WVFB, NRCS

TIMELINES: Have plans in place with the first examples by December 2010.

COST: To be developed by WV DOF as needed.

MEASUREMENT OF SUCCESS: Release of communication by WV DOF.

ISSUE 2-6: The Woodlands Tax previously assessed for the Division of Forestry under 19-1A-6 of the State Code and since repealed is still listed on the internet.

GOAL: Bring such tax information up-to-date.

PROPOSED ACTIONS:

Check <http://www.timbertax.org/statetaxes/states/proptax/westvirginia.asp> and take steps to correct the information.

LEAD ORGANIZATION: WV DOF

SUPPORT ORGANIZATIONS: WVFA, WVFB, WVU DFNR, WVDT&R

TIMELINES: Have plans in place with the first examples by December 2010.

COST: To be developed by WV DOF.

MEASUREMENT OF SUCCESS: Elimination of errors.

ISSUE 2-7: The mechanism under which states and counties occupied by national forests receive property tax revenue has been negatively impacted by severe reductions in timber harvests from federal land.

Federal lands are exempt from property taxes and two mechanisms have been enacted to compensate the affected entities. The “25 percent fund” provides 25 percent of the sales of commodities and services in and from the forest to the various states and counties where such commerce takes place. In addition, the “payment in lieu of taxes” (PILT) law also compensates states and counties for the loss of property tax revenue. Neither process works well. In one, timber is not harvested. In the other, Congress does not make needed appropriations.

The Monongahela National Forest (MNF) lies within 13 counties in West Virginia. The land area occupied by such federal land varies from negligible amounts up to 51 percent in Pocahontas County (text Figure 3). The annual harvest proposed in the 1985 plan was 164 million board feet and subsequently reduced to 85 million in the final plan. Although the sustainable annual harvest is estimated to be over 200 million board feet, less than 6 million board feet were harvested in 2008.

GOAL: To determine a realistic level of income to the counties that might be probable under the 2007 plan and then interpret the negative and positive occurrences that might come from such a level.

PROPOSED ACTIONS:

1. Compare PILT revenues with probable 25% revenues if the management plan proposals are carried out.
2. Develop the amount of property tax per acre that would have been collected from the MNF land if it were in private hands and professionally managed.

LEAD ORGANIZATION: WV DOF

SUPPORT ORGANIZATIONS: WVU DFNR, WVFA, WVFB, NRCS, WVDOA

TIMELINES: Have plans in place with the first examples by December 2010.

COST: To be developed by WV DOF.

MEASUREMENT OF SUCCESS: Distribution of report based on the above actions so it can be part of the strategic plan.

ISSUE 2-8: Tax codes affecting forest land and timber sales in neighboring states differ markedly from those in West Virginia and this greatly affects competition in the hardwood industry.

GOAL: To determine the differences in taxes affecting the primary hardwood timber industry in West Virginia and surrounding states.

PROPOSED ACTIONS:

1. Revise the 2006 report, "A Comparison of Taxes Incurred During the Production and Delivery of Hardwood Sawtimber in Kentucky, Maryland, Virginia, and West Virginia" by Stuart Moss and Catherine Arano.
2. Distribute copies to the FMRC and to the industry.
3. Discuss the subject with the FMRC co-chairs and report on it during the overall report on taxation suggested by the FMRC.

LEAD ORGANIZATIONS: WV DOF, WVFA, WVU DFNR

SUPPORT ORGANIZATIONS: WVU DFNR, WVFB, WVCA, WVDOA

TIMELINES: Have plans in place with the first examples by September 2010.

COST: To be developed by WV DOF as needed.

MEASUREMENT OF SUCCESS: Distribution of report based on the above actions so it can be part of the strategic plan.

Summary of State Forester's Report to FMRC on Primary Forest Industry in West Virginia

West Virginia is a state where the forests have long played a significant role in the state's communities and economy and are still the most dynamic part of our environment.

Currently our forest based industry is faced with challenges from globalizing markets, changing demographics, dynamic international relations and an urban populace that doesn't really relate to the out-of-doors world.

Our job in the Division is to help turn the many challenges into opportunities.

Consequently, we are intent on developing a strategic plan, as suggested by your body, that focuses on the vision and principles of sustainable forest management (SFM).

We have engaged a cross section of professional foresters, through a series of committees, in a discussion about forestry. Their mission has been the elucidation of issues. After the issues are decided, they will be turned into the plan you requested.

The procedure has been and will continue to be open and transparent. The draft strategy will be written by selected professionals presented as a discussion paper to your Commission and later to all interested parties.

Today is the fourth presentation. It concerns the Primary Forest Industry — the growing and harvesting of trees — and let me re-emphasize that the mythical West Virginia forest — a pristine wilderness unaltered by humans — has not existed for thousands of years.

The first forests were the ones here when the European colonists arrived. These are often called virgin forests, but they are what grew after the Indians living here the preceding several centuries had removed from the original forests. We know now that the Indians used trees for fuel and shelter, harvested wildlife for food and clothing and learned to burn large areas of forest to increase grazing for buffalo, deer and elk. They even cleared the forest and planted crops.

The second phase was when the European immigrants arrived and through the 1800s cleared the land for agriculture and for living space. Forests were an obstacle to be removed as rapidly as possible.

The third phase was the introduction of sawmills. There was little effort at conservation. Since forests were an obstacle, there was no thought given to cutting timber in a way that would ensure perpetual use.

A fourth phase, rather quiescent, began with the completion of phase three in the early 1920s and continued through the heavy cutting of World War II on to the late 1980s.

The fifth stage began with the release of the 1989 inventory which showed a huge resource awaiting use. Dozens of firms showed interest and several major secondary facilities were enticed to the

state. These included Bruce, Weyerhaeuser, Columbia, Trust Joist, and Georgia Pacific. Local industries such as American Woodmark expanded and many smaller entities were established. During 1999, a new or expanded plant or mill was announced each week of the year.

Currently, every mill in the state has been enlarged and/or modernized. Those we have now can produce more lumber than the 1,509 mills that existed here in 1909, one hundred years ago.

As the population increases, we have a shrinking land base. Although we are the 3rd most forested state, quite a bit of it is in very small, what I call residential tracts, those less than 10 acres. Their problems are more in tune with those of urban and community forestry and I am proposing that these be part of the urban and community forester's responsibilities.

Forest management is currently taking place in an environment of social and economic change. The growing environmental awareness and consumer demand for more socially responsible businesses have pushed third party forest certification to the forefront, but many firms have never heard of it.

Forest certification is when an independent organization develops standards of good forest management and independent auditors issue certificates of verification to operations that comply with the standards.

The concept of sustainability is still vague. It's still evolving, still being shaped by society. There is a lot of uncertainty. However, the world's markets are now demanding wood from sustainable forests.

As time passes, we believe there will be more public involvement in forest management. This is important because conventional wisdom is difficult to overturn.

We will need to integrate better environmental accountability. We will need to develop a database on the quality of ecosystems.

We need a more or less continuous report of forest insects by ecological regions.

I am currently asking for a review of all maps which have been used in government and industry to record forest problem areas with the end result to be an atlas of superposed maps of each subject. With this information, we can show the continuing annual growth losses from such occurrences.

The Division has several state-owned forests on which we have installed or are beginning intensive management. Our plans are for them to serve as laboratories, demonstrations, and showcases. We will keep cost data on every activity from removing grapevines to removing surplus timber and use these to show citizens that good management pays.

Today, everyone in the state has a role to play in ensuring our forest heritage. We hope that the strategic plan we are working on unites them under a common vision that will benefit current and future generations.

Forest management must also tend to the vital ecological roles of the forest in general. The forest is a biodiversity storehouse. It stores carbon, produces oxygen, filters our air and water,

moderates our climate and guards against soil erosion. About four-fifths of the state's organisms live in the forest or depend on forest habitat.

Finally, please remember that science is not just a system of beliefs. Fact, on which forest science is based, must be repeatable. Much on which we are questioned is pure myth, an invented tale which has acquired the status of dogma.

The guide being used to plan for the future of West Virginia's forests is that "Forest Management is not a subjective endeavor." Forests are the most precious non-family possession we have and we must manage them wisely.

THANK YOU ALL...

3. Primary Forest Industry in West Virginia

The Primary Forest Industry Group identified a total of 7 issues.

ISSUE 3-1: As the population grows and the demand for wood fiber increases, there may not be enough loggers available to meet production goals of the processing industry.

The downturn in lumber prices has seen loggers turn to the better paying jobs in the mining industry. The downturn has also resulted in fewer equipment upgrades. A 2001 study also indicated that the average age of the loggers in West Virginia was 48 with only 20% being younger than 40.

GOAL: Accelerate efforts to encourage more efficient management of current logging operations while working to increase the development of new crews.

PROPOSED ACTIONS:

1. Develop a program to encourage the development of logging infrastructure in West Virginia.
2. Accelerate work with loggers to insure safe work practices so that insurance costs will be reduced.
3. Reinstigate the program to help West Virginia loggers be more productive and more efficient in day- to- day business operations.
4. Develop a program to encourage loggers to develop alternative markets, especially those dealing with biomass products, in addition to sawlogs and veneer.
5. Develop a study of the current logging infrastructure to ascertain areas where resources are needed to increase the number of logging operators.
6. Prepare the pros and cons of developing company crews by timber processing companies.

LEAD ORGANIZATION: WV DOF

SUPPORT ORGANIZATIONS: WVU DFNR, USDA FS research, WVDOE, WVFA

TIMELINES: To be developed by WV DOF.

COST: To be developed by WV DOF as needed.

MEASUREMENT OF SUCCESS: Programs in action.

ISSUE 3-2: There is a need to develop new regional and local secondary manufacturing as a way of making the primary forest industry more profitable.

Although West Virginia is a relatively small state, it has a high quality wood resource that is located within overnight trucking distances of nearly half of the U.S. and Canadian populations as well as major overseas export facilities.

GOAL: Encourage more secondary manufacturing in the state.

PROPOSED ACTIONS:

1. Analyze available plant locations in a way that considers both the resource and the transportation network.
2. Organize cooperation with the WV Development Office and Local Development Authorities to promote the development of new wood products manufacturing facilities in the state.
3. Prepare a report on current state laws and regulations explaining how they aid in the development of new wood products ventures with suggestions for improvement where needed.
4. Development of a loan fund.

LEAD ORGANIZATION: WV DOF

SUPPORT ORGANIZATIONS: WVU DFNR, USDA FS research, WV Development Office, WVFA.

TIMELINES: To be developed by WV DOF as needed.

COST: To be developed by WV DOF as necessary.

MEASUREMENT OF SUCCESS: To be developed by study committee.

ISSUE 3-3: Trucking costs are a major factor in marketing West Virginia wood products. The shortage of rail-sidings and intermodal facilities in West Virginia greatly limits the ability of primary producers to efficiently market their products.

This is a long standing problem, made even more acute by the mountainous terrain and the lack of other manufacturing facilities that would increase the overall freight volume within the state.

GOAL: Develop a study to analyze the need for more rail infrastructure, where it could be advantageously developed; the volume of products that it could ultimately transport, and the feasibility of government or private development.

PROPOSED ACTIONS:

1. Review past transportation studies to determine whether wood volume has been a consideration, if obstacles have been defined and why the studies were not ultimately successful.
2. Develop new study within the above stated goal.
3. Review railroad abandonment in West Virginia during the last five decades.

LEAD ORGANIZATION: WV DOF

SUPPORT ORGANIZATIONS: WV DOF, WVDOT, WPA

TIMELINES: To be developed after review is complete and study developed.

COST: To be developed by WV DOF as needed.

MEASUREMENT OF SUCCESS: Reports available.

ISSUE 3-4: There are no shortages of readily available educational materials to use in informing the citizens of the state as to the importance and utility of wood, the states' most widespread and vital resource.

Almost daily, misinterpretations about the wood industry are carried by the media, pronounced by activist groups, and lamented by professional foresters and the industry in general. Many, if not most, of the erroneous characterizations could be corrected by the development and dissemination of additional educational materials patterned after those used by Project Learning Tree, Teachers for the Forest, the Arbor Day Foundation, etc.

GOAL: Educate the public in general and the K-12 children in particular about economic advantages of harvesting the West Virginia wood resource and why ecosystem forest management and harvesting are not only profitable and desirable, but are the only way to insure the sustainability of the resource.

PROPOSED ACTIONS:

1. Organize teaching assistance, including volunteers to assist with the above current endeavors, in all 55 counties.
2. Study the need for specific educational materials, develop them or have them developed and locate sponsors in each county to assist in providing them.
3. Organize and publicize a speaker's bureau to deliver talks about the industry to service clubs and other localized organizations.
4. Develop a field teaching bureau to show the public the whys and wherefores of professional forestry. Begin by teaching several sessions of tree identification, wildlife identification and habits etc.

LEAD ORGANIZATION: WV DOF

SUPPORT ORGANIZATIONS: WVU DFNR WVFA, WVDOE

TIMELINES: To be developed by WV DOF.

COST: To be developed by WV DOF.

MEASUREMENT OF SUCCESS: To be developed.

ISSUE 3-5: The primary forest industry is in a time of rapid change. The manufacturing corporations have access to better information than the government can ever provide, but landowners, loggers and policy makers in general do not have a dependable, readily available source that supplies accurate up-to-date information about the state's forest industry for use in decision making.

GOAL: To provide accurate current information about stumpage and log measurements, stumpage and log pricing, log grading, logging transportation costs, and taxes for use in decision making.

PROPOSED ACTIONS:

1. Provide fact sheet on how such information is developed and why it is important to landowners, loggers and economic and environmental decision makers.
2. Provide quarterly Information via the suggested speaker's bureau, media dissemination, and web pages.

LEAD ORGANIZATION: WV DOF

SUPPORT ORGANIZATIONS: WVU DFNR, WVDOE, WVFB, WVFA

TIMELINES: Have plans in place with the first examples by July 2011.

COST: To be developed by WV DOF as necessary.

MEASUREMENT OF SUCCESS: Actions accomplished.

ISSUE 3-6: Information about the various “green” forestry programs is not readily available to the smaller land ownerships and to the public in general. There are four so-called green standards in effect. Certification satisfies retailers that sell only “green” products and is excellent public relations. They all cost landowners money.

1. The Forest Stewardship Council (FSC) coordinates an independent, nonprofit, nongovernmental program as an “environmentally appropriate, socially beneficial and economically viable management” suitable for the world’s forests. The sustainability guidelines for certification are implemented by the Rainforest Alliance Smart-wood Program or the Scientific Certification System. Certification begins with a review by an independent three-person team that conducts interviews and inspects the forest. FSC acceptance is based on the timber resource and financial-socioeconomic sustainability and forest ecosystem maintenance. Certification lasts five years with annual audits.

2. The Sustainable Forestry Initiative (SFI) is mandatory for member companies of the American Forest and Paper Association. It is primarily for forest products companies. Third party verification is not required, but many do ask for it. Others self-verify that they are in conformance. Re-verification is required within three years and at five year intervals. The SFI has no eco-labeling approach. It does have a logger-training program.

3. The International Organization of Standards (ISO) is the oldest program and the only one that is worldwide. This organization’s environmental management system standard (NO. 14001) is for any size ownership. The focus is on assessment and management of environmental problems associated with the landowner’s operations or activities. Either of the other two systems can be integrated.

4. Tree Farm

GOAL: Develop a program whereby landowners operating under a certified management plan including adherence to silvicultural Best Management Practices (BMPs), including seasonal restraint, will satisfy citizen’s, activist’s and consumer’s concerns about how West Virginia’s forestlands are being managed.

PROPOSED ACTIONS:

1. Develop a fact sheet showing why such compliance can be financially and socially beneficial to the landowner.
2. Conduct landowner seminar’s to further explain the techniques and rewards.

LEAD ORGANIZATION: WV DOF

SUPPORT ORGANIZATIONS: WVFA, WVFB, WVU DFNR, TNC, NRCS

TIMELINES: Have plans in place with the first examples by December 2010.

COST: To be developed by WV DOF as needed.

MEASUREMENT OF SUCCESS: Actions completed.

ISSUE 3-7: A lack of comprehensive up-to-date information about changes in West Virginia's primary forest industry, brought about by recent shifts in the national and state economies, is a hindrance to strategic planning efforts.

GOALS: Revise the inventory of ownership patterns of mills, dry kilns, logging crews, equipment dealers, and other entities that are integral for a flourishing primary forest industry support in West Virginia. Prepare a summation of the data for use within government and industry.

PROPOSED ACTIONS:

1. Prepare and distribute a questionnaire to all such entities of record during the last three years to use in preparing an inventory of change for use in predicting planning parameters.
2. Circulate the summation to all entities, revise if necessary and then use in preparing the strategic plan called for by the FMRC.

LEAD ORGANIZATION: WV DOF

SUPPORT ORGANIZATIONS: WV Department of Commerce divisions, WVU DFNR, WVFA.

TIMELINES: Preparation of questionnaire (WV DOF) by 12/15/10; preparation of mailing list (DOF, WVFA) by 2/15/10; distribution of questionnaire (DOF) by 3/1/11; distribution of 2nd. request (DOF) by 4/1/11; receipt of data by 5/1/11; and analysis of data (WV DOF, WVU DFNR, DOC entities) by 7/1/11.

COST: To be developed as needed by WV DOF

MEASUREMENT OF SUCCESS: Preparation of a statewide directory of West Virginia primary forest industry entities with remarks on the growth and retrenchment of the last three years. Use of the data in preparing and modifying the strategic plan.

Summary of State Forester's Report to FMRC on Secondary Forest Industry in West Virginia

This is my fifth report in a series discussing the proper course West Virginia should follow in preserving the productive power of our West Virginia forests and how we can best utilize the forest products from them.

The Division staff and our volunteers greatly appreciate the opportunity you have provided because forests are such an integral part of our landscape that their importance and need for management are often overlooked.

We see quality planning as the difference between cost-effective, proactive management and costly crisis management. We accept that a good plan provides the framework for program implementation and a basis for consistent decision-making. These will be the tools we use to determine future budgets and other support needs.

One important obstacle is that the average citizen assumes that every person's interest is defined totally by what that person does. For example, a forest industry person is thought of only as someone interested in merchantable timber; a hunter only in game animals; an environmentalist only in forests where trees are seldom if ever cut and so on. These caricatures are seldom totally correct. Such beliefs, however, are powerful. Local stories often make the news which is sometimes ballooned into state wide and/or regional prominence by the media. The result sometimes results in a total misunderstanding and/or misapplication. In such instances all aspects of forestry suffer.

This is an important point because to get a new secondary industry to come to or to be developed in West Virginia you first have to prove that there is a primary forest industry capable of and interested in providing the raw material; that there will be material around for the planned life of the new industry and that citizens want it. In other words, you can't get a development if you can't prove that long range there is something to develop and that the citizens are for it.

The Division believes that six basic questions that must be answered conclusively before a new secondary industry will even give consideration. These are:

1. Is there an available site of suitable acreage or is there a site that can be modified for use?
2. Is there an adequate forest inventory of the needed species within 25, 50 or 100 miles?
3. Are the forests in the prescribed circles under written management plans? Is there a good track record on the ownerships?
4. Do the citizens have a positive attitude about forest industries? Are they committed to high environmental and social standards? Do they constitute a skilled workforce?
5. Do the state's citizens in general understand how the forest industries contribute to their quality of life?
6. Are there social, cultural, environmental or economic considerations that could provide obstacles or that might become obstacles in the future?

The forest management component is the foundation to secondary industry considerations. For example, will the forest management be subverted resulting in overcutting if the price is right? Will the mills in such considerations double shift or work longer days regardless of sustainability? Will the environment be ignored on rainy weeks or will the mill be supplied with logs anyway? Are log stockpiles maintained to cover for climatic abnormalities?

Industry often asks its own questions or has someone get the answers. The answers are sometimes surprising. I have selected a few examples to show you from a study the Georgia Pacific Corporation had done as it was contemplating expansion in West Virginia.

Another example is a study the Mead Corporation commissioned. This shows (slide) the cover of a report that was nearly 600 pages of statistical data.

A more localized example concerned the availability of yellow-poplar. These are some of the maps showing the location and volumes of yellow poplar.

As you can see, forest management has become very challenging as attempts are made to balance the many different concerns, policies and practices. The manager not only has to grow quality trees and non-timber products, but must also conserve biological diversity, insure rural-community well being, provide abundant game, work towards steady employment, protect private land ownerships, work towards international trade and insure that the environment is protected. It's a big and really important job. Thousands of individual land owners must be convinced that management is important and that the professionally prepared plan needs to be followed.

The current buzzword is change and embracing change will be the key to the future. Governments, industry and communities must innovate, adapt and turn the challenges into opportunities. Public lands must be involved, particularly when they, as in the case of West Virginia, contain at least one-third of the quality timber in the state.

There has to be a collective determination to anticipate and embrace change. West Virginia's future will be defined by its forests as the extractive industries based on finite resources slowly disappear. In this regard we must remember that the growing of a forest crop takes a long lifetime, 80-100 years, exceeding the life of even a recently built facility.

As for primary forest management, the Division of Forestry is currently thinking of a network of model forests to serve as laboratories for the development and testing of innovative approaches to sustainable forest management. These will join with those being developed in other states and nations.

Finally, you are probably tired of hearing about sustainability, but let me go over part of it again.

The term has not been around very long.

It first appeared in a 400 page report published in 1987 by the United Nations World Commission on Environment and Development under the title *Our Common Future*. The report's author stated that it was the ability "*to meet the needs of the present without compromising the ability of future generations to meet their own needs.*" As stated admirably by Armson, a Canadian

forester, *“sustainability is a human construct and therefore subject to a wide range of social, economic and cultural conditions – to say nothing of the given state of scientific knowledge and technological innovation.”* As you can see, there can be a wide range of opinion as to what sustainability actually means.

Armson goes on to say that sustainability *“has no meaning unless the what-where-when-how-who components of its implementation are identified.”* And *“the notion of sustaining forests is vacuous unless accompanied by specific objectives and a rationale for implementation of activities to meet those objectives in both the short and long terms, while achieving the values desired.”* It’s human commitment and the associated actions that are necessary to achieve sustainability. *“It is obligatory,”* he continued, *“to start with a complete as possible inventory of what exists and how it came to be.”* The trees present and the soils are particularly important. Also needed is as much historic information as it is possible to get about the collective effect of past human and non-human influences.

The earliest demands for sustainable practices emerged from the European markets as a result of pressures from European non-governmental organizations (NGOs). West Virginia and other U. S. firms with sales in European markets began to make symbolic changes in their reports and talked about investing in sustainability. The idea became a buzzword and companies now have to proactively adopt sustainability thinking and practices. The key will be the proof used. It reminds one of the stories told about the early “oak wilt” quarantines. A brief check made at the time of oak being sold from West Virginia indicated that nearly 100% of the red oak produced in the state was being certified as originating in Webster County, the county in which the disease had not been found. Industry had found that trees from that county could be exported without special treatment.

Certification, as we now have it, can differentiate many of the key elements of good and bad forest management. Chain of custody auditing is very important. This means an unbroken trail of accountability ensuring the physical security of records, data and materials. The emergence of third party forest certification programs is now a driving force, but it is expensive.

Everyone seems interested in the secondary forest industry as an important part of economic development. My opinion is you first have to have the best possible primary forest industry before you can expect success. Only time will tell if all of the components will mesh. I hope they do.

Thank You.

4. Secondary Forest Industry in West Virginia

The Secondary Forest Industry Group identified a total of 10 issues.

Brief History

The wood products industry in West Virginia ranked third in employment and fourth in payroll through the late 1980s through the new century. If furniture manufacturing is added, the combined industries account for over 15% of West Virginia's total manufacturing employment. The wood products industry led all other West Virginia manufacturing sectors in adjusted real growth between 1997 and 2001. Beginning in 2005, a decline in the housing markets slowly filtered into the WV Forest Products Industries and began a major down turn. Problems included: 1). Flooring and kitchen cabinets beginning to slow. 2). Decreased logging capacity started with ever increasing costs. 3). Landowners began holding stumpage for historically higher prices. 4). Export Markets becoming more difficult. 5). Increasing fuel cost driving freight rates and a slowing U.S economy. Hardwood lumber production declined 19% in 2008. Several mills have had to slow production or close, leading to layoffs and unemployment.

ISSUE 4-1: We are uncompetitive with other states in regard to tax, regulatory issues and legal climate. West Virginia is ranked next to last in the business climate.

GOALS: To examine the state's competitiveness /competition with tax, risk, and regulatory issues with respect to other states. There is a need to examine the situation in other states in regard to taxes and regulation.

PROPOSED ACTIONS: As stated in the goal.

LEAD ORGANIZATION: WVU

SUPPORT ORGANIZATIONS: USFS S&PF, USFS research, NRCS, WVFB, WVU DFNR

TIMELINES: Have plans in place with the first examples by December 2010. (Issue 2-8)

COST: To be developed by WV DOF and WVU DFNR.

MEASUREMENT OF SUCCESS: To be developed by WVU DFNR.

ISSUE 4-2: There is a need to broaden markets for WV forest products

GOAL: Identify non-traditional forests products.

PROPOSED ACTIONS:

Appoint a committee to prepare a report.

LEAD ORGANIZATION: WV DOF

SUPPORT ORGANIZATIONS: USFS S&PF, USFS research, NRCS, WVFB, WVU DFNR

TIMELINES: Have plans in place with the first examples by December 2010.

COST: To be developed by WV DOF as needed.

MEASUREMENT OF SUCCESS: Action completed.

ISSUE 4-3: Lack of focus on the success of the WV Forest Secondary Products Manufacturing Industry.

GOAL: Develop the vision so that it can be communicated state-wide.

PROPOSED ACTIONS:

Study the various techniques, select one and initiate the preparation of a draft paper.

LEAD ORGANIZATION: WV DOF

SUPPORT ORGANIZATIONS: USFS S&PF, USFS research, NRCS, WVFB, WVU DFNR

TIMELINES: Have plans in place with the first examples by February 2011

COST: To be developed by WV DOF as needed.

MEASUREMENT OF SUCCESS: Action completed.

ISSUE 4-4. Consumer & market information is not reaching all levels of the supply chain.

GOAL: Provide consistency between Primary and Secondary Industry and the customer. Investigate methods or ways to streamline the supply chain.

PROPOSED ACTIONS:

Prepare and distribute an outline of ways to begin the development of a program.

LEAD ORGANIZATION: WV DOF

SUPPORT ORGANIZATIONS: USFS S&PF, USFS research, NRCS, WVFB, WVU DFNR

TIMELINES: Have plans in place with the first examples by December 2010.

COST: To be developed by WV DOF as needed.

MEASUREMENT OF SUCCESS: Action completed.

ISSUE 4-5: The definitions used to characterize the primary and secondary forest industry are sometimes misleading.

Primary forest industry includes the firms that sever timber and transport it to a yard or to a mill for additional processing. Sawmills that convert the logs into green lumber are sometimes included as primary forest industry but under WV law a severed tree is a manufactured product although cutting into logs is termed primary. Secondary forest industry includes industries who add value to wood or wood fiber beyond the primary conversion, i.e., dry kilns, mills, furniture and fixture manufacturers, panel manufacturers, cabinet manufacturers, etc. Paper mills are also included as secondary forest industry as are those who use waste as the raw product, i.e., pellet, charcoal, and mulch manufacturers and mill waste burning in boilers to generate electricity.

GOAL: To establish definitions that are both popularly and technically identifiable.

PROPOSED ACTIONS:

1. Establish committee to review the number of secondary manufacturers in the state, the percentage of all manufacturers they represent, the percent of all employers they represent, the number of persons employed by primary and secondary wood product manufacturers, the number of individuals and firms engaged in a forest product business other than wood, i.e., medicinal plants, ornamental shrubbery, moss etc.
2. Prepare or have reports prepared on each of the above items.

LEAD ORGANIZATION: WV DOF

SUPPORT ORGANIZATIONS: USFS S&PF, USFS research, NRCS, WVFB, WVU DFNR

TIMELINES: Have plans in place with the first examples by December 2010.

COST: To be developed by WV DOF as needed.

MEASUREMENT OF SUCCESS: Actions completed.

ISSUE 4-6: There is controversy about the export of raw materials harvested in West Virginia forests and exported to other states for processing.

There is a general belief in the citizenry and some industry that it would be better if the logs harvested in the state were to be processed into other products before being exported. The belief is that more wages would be paid, more income tax would result, local communities would benefit from the expanded economy, and forest industries, in general, would be strengthened.

GOAL: Investigate to see if the business climate in West Virginia is amenable to firms establishing additional secondary processing within the state.

PROPOSED ACTIONS:

Organize a forum of leaders in the secondary forest industry to recommend practical ways of expanding the secondary forest industry.

LEAD ORGANIZATIONS: WV DOF, WVFA

SUPPORT ORGANIZATIONS: WVFB, WMMA, WVC of C, BIC

TIMELINES: Have plans in place with the first examples by September 2010.

COST: To be developed by WV DOF.

MEASUREMENT OF SUCCESS: Goal achieved.

ISSUE 4-7: Energy sources and costs are a critical factor in West Virginia, but the total energy consumed by the West Virginia primary and secondary forest industries is unknown.

GOAL: Develop data to illustrate the effects of energy prices on the secondary forest industry in West Virginia.

PROPOSED ACTIONS:

Organize a committee to develop the needed information and to make recommendations that can be presented to the FMRC.

LEAD ORGANIZATIONS: WV DOF, WVFA

SUPPORT ORGANIZATIONS: WV C of C, BIC, WVMA

TIMELINES: Have the committee in place by July 2010.

COST: To be developed by WV DOF.

MEASUREMENT OF SUCCESS: Completed committee report.

ISSUE 4-8: WV DOT trucking weight regulations are not consistent with the Interstate Highway System or with those of surrounding states. Specifically, truck weight regulations for forest products are not consistent with other products transported within West Virginia.

GOAL: Update past studies on this matter of concern so it can be presented to the FMRC.

PROPOSED ACTIONS:

Organize committee to conduct the necessary study and to make recommendations.

LEAD ORGANIZATIONS: WV DOF, WVFA

SUPPORT ORGANIZATIONS: WV C of C, BIC, WVMA

TIMELINES: Have committee in place by December 2010 with the first data to be ready by March 2011.

COST: To be developed by WV DOF as needed.

MEASUREMENT OF SUCCESS: Recommendations distributed.

ISSUE 4-9: There are loop holes in the timber severance tax law that impedes secondary manufacturers.

GOAL: Organize and conduct a study to identify problems and suggest how they can be corrected.

PROPOSED ACTIONS:

1. Organize an in-house study of the problem.
2. Prepare a confidential questionnaire that addresses the problem and circulate it throughout the secondary forest industry.

LEAD ORGANIZATIONS: WV DOF, WVFA

SUPPORT ORGANIZATIONS: WV C of C, BIC, WVMA

TIMELINES: Have plans in place with the first meeting by September 2010.

COST: To be developed by WV DOF as needed.

MEASUREMENT OF SUCCESS: Study report.

ISSUE 4-10: The various super-tax credits available to the forest industry are not generally understood.

There are several super tax credits available to assist in attracting new manufacturing industry to West Virginia. Two well-known ones are the Industrial Expansion and/or Revitalization Program and the West Virginia Capital Company Credit Program administered by the West Virginia Economic Development Authority. Other programs are administered by State Tax and other Departments.

GOAL: Compile a list of all tax credit programs by units of West Virginia governments.

PROPOSED ACTION:

Form a committee to investigate and prepare a report.

LEAD ORGANIZATIONS: WV DOF, WVFA

SUPPORT ORGANIZATIONS: WV C of C, BIC, WVMA

TIMELINES: Have committee in place by September 2010 with report due by December 2010.

COST: To be developed by WV DOF.

MEASUREMENT OF SUCCESS: Report circulated.

Summary of State Forester's Report to FMRC on Forest Ecology in West Virginia

Forest management is complicated. It is so because of forest ecology, *the science of the interrelationships of plants, animals and micro-organisms with the non-living physical factors of the environment.*

The story begins with the earth. The land can be divided into bands, stacked in both directions from the equator to the poles, of living communities that plant geographers call biomes. These bands form because of the climate and the geology.

Climate is entirely due to the angle at which sunlight hits the earth. At the equator, sunlight hits straight on and gives maximum energy; at the poles it hits at an angle with less energy per square unit.

West Virginia is in the temperate forest biome. It has a particular climate and is inhabited by a particular group of animals and plants. The main characteristic is that the forest is comprised primarily of deciduous trees – those that drop their leaves each fall and regenerate a new set each spring. In addition, there are four seasons of about equal length, there is no dry season, wildlife is abundant with several species, salamanders are especially numerous, and the plants are stacked in layers – canopy, understory, shrubs and herbs. When we manage the forest, we manage all of these things. When we cut trees we, to some extent, affect each layer or group. When we utilize the forest to grow trees at their finest we also affect every other organism, usually positively. Good forest management is good silviculture, which in turn is good wildlife and good soil management.

The deciduous forest is highly varied from place to place. For example, the oak forests of Missouri aren't the same as those in West Virginia and both differ from those in Connecticut. Nearly all of the forests in this biome have, at some time, been cleared for farming or logged for wood and a lot has been burned in recent centuries.

The four seasons are caused by the sun's energy. The earth is tilted on its axis. Consequently, during part of its orbit the northern part is closer to the sun and we have the long, warm days of summer. Conversely, the southern part of the globe is farthest from the sun and has the short, cold days of winter. This is reversed at the other extreme of the orbit. Fall and spring are in-between times.

The forest floor is also different. The leaves fall and are decayed. Just underneath of the leaves is a dark unit of decayed leaves called humus that has been much mixed and broken down by the activities of earthworms, crickets, roaches, ants, fungi, and bacteria, among others. Tiny pieces of broken rock underlie this layer and below that is the rock that has weathered into subsoil and then the base rock itself. The rain percolating through dissolves minerals and all of this helps create the soil, perhaps an inch per hundred years.

The trees are important economically and ecologically. Their prominence and beauty makes them also important socially. Amongst all of this there are dead and dying trees that form wildlife condominiums and later add to the humus while also serving as food for a multitude of insects, small and large animals. When the forest floor is not continuously replenished with rotten animals and plants,

leaves, small branches etc. the soil becomes impoverished. Thus, removing rotting logs, leaves, mosses, herbs etc. from the forest floor is generally not a good idea unless done according to a plan that weighs the plusses and minuses.

West Virginia's forests have a very diverse ecology. They vary greatly from south to north, from the lowest to the highest elevation, and even from east of the mountains to west of them. While discussing the inventory with you last month, I mentioned that Division personnel were debating whether to present the overall statistics in three or five subdivisions because of the varied ecology. A breakdown based on biology and geology is necessary because to manage the forests both economically and ecologically we need to group the differences and similarities to avoid errors that might haunt future generations. These differences, and the influences they control, such as the local climate, *comprise the ecology that a professional forester has to understand in order to manage the overall forested ecosystem.*

Our mixed mesophytic forests, our largest subdivision, are the richest of the temperate regions. There are 30 important commercial species – trees such as the sugar maple, red oak, tulip poplar, black walnut, white oak, buckeye, black oak, at one time the American chestnut, and so on. At high elevations along the Appalachian Mountain chain, this forest changes to a northern forest characterized by, American beech, black and yellow birch and sugar maple. At still higher elevations we have nearly pure red spruce forests. The eastern soils, from older rocks are much shalier, have white pine forests and oaks and hickories.

Each acre has hundreds, if not thousands, of shrubs, herbaceous plants, algae, fungi, invertebrates such as ants, roaches, earthworms, bacteria, lichens and many, many others that function together and interact with each other and with all of the non-living or abiotic factors that are there. It's impossible to make a management move that doesn't give an advantage to an organism other than the one you are manipulating. In other words, *the forest is a network of interrelationships, not just a collection of objects.*

In managing an ecosystem, we begin by studying the composition, structure and function. What are they? Well, "composition" is the pieces of the puzzle; "structure" is how the pieces are arranged; and "function" is what each piece does, including the interactions among the pieces. A rotten log with its plant and animal species is an ecosystem or all of the rotten logs can be grouped as an ecosystem.

Ecosystems operate on a series of thresholds. We have to realize that a forest ecosystem will collapse if pushed too hard for short-term products or allowed to grow too old to be vigorous. A forester also has to be ready for managing uncertainly, such as a sudden insect outbreak, a drought and the resulting fire, an ice storm and the needed salvage. All have to be thought of in advance and made a part of a plan. To say it another way, forests are managed as more than perpetual producers of commodities.

When you are provided a forest to manage, you begin with a site-specific pre-harvest prescription. You decide what you will have to do to harvest a good crop of timber, at a profit, while keeping it aesthetically pleasing and without doing environmental harm to the many ecological entities. Mistakes are made when this step is bypassed. This step is the forerunner to detailed planning for the operational plan which will guide harvesting, regeneration and silviculture on a tract. In other words, site-specific, ecology-based management strategies are necessary for preparing the long-term management prescriptions that are necessary for sustainable forest management.

5. Forest Ecology in West Virginia

ISSUE 5-1: There is a need for examples that can be used to show West Virginia's diversity of forests as a beginning for both popular and professional understanding of the interrelationships of the ecologic, economic and social parameters of forestry.

The various plants and animals that comprise a forest ecosystem are not a random set of organisms. They are found on a particular site because they are adapted to the physical environment and the interrelationships of living together. When one organism is manipulated or changed it invariably affects another or even several others. This is not well known to the public or even to some of the specialized natural resource professionals. Yet such an understanding is vital to forest sustainability. Ultimately, there has to be a quantifiable character, as opposed to an abstraction, to biodiversity. This is very important in explaining forestry to nonprofessionals and nonprofessional support is vital to forestry as a biologic science and as an economic endeavor. A common question is how many species are there and how many depend on one another? Currently, we just don't know and people have less respect for things they know little about.

GOALS: To establish seven areas as permanent demonstrations to show the diversity of West Virginia forests and how professional forest management must be varied. To have professionals from different disciplines investigate and record all possible species on the site with annual updating.

PROPOSED ACTIONS:

1. Form a small, but select committee of professional foresters, forest botanists and wildlife professionals to develop guidelines for selecting one hectare north and south facing sites in each of the three primary forest ecotypes in West Virginia plus the high mountain red spruce and eastern white pine ecotypes.
2. Select the sites (10) through field observation for suitability, preferably on public lands, and, obtain permission to establish permanent corner monuments.
3. Utilize volunteers or seek financial assistance to engage needed professionals to identify species.

LEAD ORGANIZATION: WV DOF.

SUPPORT ORGANIZATIONS: WVU DFNR, NC, WVFB, NRCS, WV DNR , USFS.

TIMELINES: Complete site selection by September 2010 with semiannual reports, field trips and seminars to begin by May 2011.

COST: To be developed by WV DOF after site selection.

MEASUREMENT OF SUCCESS: Plot establishment and first newsletter illustrating differences and similarities.

Summary of State Forester's Report to FMRC on Dangerous Factors Affecting Forestry – Historic, Current, Future

As with the past reports in this series, I discuss the problems and give some history, but leave the actual specifics and statistics for those writing the strategic plan. Their job is tremendous, especially in considering everything and coming up with an overall forestry policy based on scientific fact, but without the many specific details that must be left to the practicing professional forester. And let me emphasize again, forestry is a complex field and one type of plan doesn't fit all forest types. In other words, one size doesn't fit all.

As to forest dangers, West Virginia is somewhat unique in that much of the insect and disease work is handled by the West Virginia Department of Agriculture's Division of Plant Pest Control. This started as a cooperative effort in the early 1950s and both sides consider it as an efficient and proficient endeavor. Agriculture has good entomologists and pathologists. The cooperation is excellent; it was also this way in the past. This circular (on slide) was distributed by the B&O R.R. in 1911. It had a fine paragraph on forestry.

Just for fun, I thought I would show you a picture of unmanaged virgin forest and 120 year old trees in a managed woodlot, the one on the left is a red oak and the other two are sugar maples, taken by a friend, he hasn't said exactly where, but in February 2005. All three are in excess of 40" dbh.

In general, the many damages that accrue to a forest are one of the most important aspects of and one of the most overlooked.

The term covers everything that causes or can cause injuries to living trees and to wood. A partial listing would include forest fire, insects, mites, nematodes, disease causing fungi, weather, poor nutrition, stagnation due to overstocking, old age or maturity, prolonged drought, excessive rain, late spring frosts, ice storms, lightning, hail, air pollution, salt used on roads, wildlife, domestic animals and man. The annual statewide damage runs in the millions of dollars. We must reduce this loss.

As you look at the list I'm sure you are thinking "You can't control nature; we have to live with it — with lightning, sleet, drought, high winds...and that is very true. However, a professional forest manager plans for such contingencies. He has the forest in a healthy condition through good silviculture. Quite often this means survival or minimum damage. In sustainable forest management, advance preparation is vital.

A few examples include protecting against uncontrolled fire, avoiding soil compaction, harvesting over-mature trees, keeping good stand structure — that is having trees of all sizes, encouraging a good tree species mixture, reducing wildlife over populations, removing genetically deficient trees, conducting insect and disease surveys to prevent surprises and logging in a way that protects the residual stand and site and provides for advance reproduction.

Unfortunately, in the various efforts to make forestry into something for everyone there is a tendency to forget that forest trees are crops and crops need protection. A professional forester is trained to consider all aspects of growing the crop as well as managing all related entities. The many subdivisions of forestry do have discipline specialists hard at work, but the forest manager is usually a generalist, trained as a near expert in all the sub-disciplines. In forest management, policy is usually guided by the sustainability triangle with economy, ecology and society as the sides. They are never equal, but all three are ever present considerations.

Many of the problems we face have been caused by man importing uninspected plants or plant products or animals including fish that, without natural enemies, spread like wildfire. This is a paragraph from a bulletin of 1891 (on slide) showing that Tree of Heaven was already growing well in the state. We have time today for just a few historic examples.

The first major and very damaging pest problem in West Virginia occurred in 1880 - 1893 when the southern pine beetle, usually thought of as a problem in the deep south, killed nearly 300,000 acres of virgin spruce as well as large acreages of white pine. The entomologist who inspected the problem and imported insects from Germany to fight it (the first biological control in the United States) was a West Virginian from near Ripley named A. D. Hopkins. Hopkins became an associate Dean at WVU and later was in charge of forest insect work for the entire U. S. Forest Service. On a worldwide basis, he is one of the really well known scientific personages with several discussions of his work on the internet. One of the first experimental stations in this state was established on his farm in Wood County by the federal government when he retired from active duty.

This insect wiped out most of the virgin spruce in Tucker, Randolph and Pocahontas counties and a lot of the pine in eastern counties. His largest bulletin on the matter was published in 1899.

Chestnut Blight was the second major pest problem to appear. It is caused by a fungus that is native to Asia. Chestnut was being cut for lumber in 1915 at a rate of 118 million board feet annually. Its demise was quite a loss. The nuts were sold nationwide. An average of 150,000 pounds of chestnuts were shipped each year from a single railway station in Preston County, and this was just one of many such shipments. As you perhaps know, the mast seldom failed because the tree flowers in June, long after the frosts have passed.

How did the disease get here? Plant breeders brought Chinese chestnuts to the United States to try to hybridize them with the larger U. S. tree hoping to produce the larger Chinese size chestnuts. Some were infected. The rest is history. The effort failed, but the disease didn't. It is still here.

Incidentally, Chestnut Blight was first found in West Virginia at Pickens, Randolph County on two small trees purchased from a Pennsylvania Nursery and planted in a yard. These were promptly destroyed and no spread was ever traced to them. In retrospect, I can't imagine why anyone would buy chestnut seedlings when the surrounding woods were filled with them.

On November 9, 1912, infected native chestnut trees were found near Harper's Ferry. The disease spread rapidly through Berkeley and Morgan counties. Through 1915 no infections had been found west of the mountains, but being spread by the wind, it soon jumped westward with the big die off occurring statewide in 1926. The total amount of chestnut lumber in the state at that time was variously estimated as being from 2 to 10 billion board feet. It was probably about 5 billion board feet. The lumber was soft and used in cheap furniture and to frame buildings. The major use was for nuts. The State Legislature along with WVU built a cabin to house research workers on donated land in the eastern panhandle. In 1915 the appropriation was stopped and the camp fell into disuse. The current renewed interest in this research is leading to near disease resistant varieties. This Division is cooperating with the state of Ohio in raising seedlings at the Pt. Pleasant Tree Nursery.

A third important problem is the White Pine Blister Rust which came to America on the millions of seedlings shipped from Germany, where they could be produced cheaper, for planting in this country. The disease was first found in West Virginia on white pine in Hardy, Tucker and Pocahontas counties in 1939 and on gooseberries, the alternate host, in Preston County. Both hosts are necessary for survival and spread of the fungus.

Currently, native white pine stands are in localized areas. White Pine Blister Rust certainly hastened the trees departure.

A fourth is the Dutch Elm Disease that kills all species of Elm. The disease was imported from France in 1933. In 1936, Blister Rust scouts found the scolidid beetle that carries Dutch Elm Disease near Parkersburg, but did not find the disease. These beetles were soon found on more than 7,500 square miles in the counties along the Ohio River. They had apparently escaped from burl logs being transported over the highways in the area to veneer factories farther west. Diseased elm trees were found at Wiley Ford in 1937. Now elm has all but been eliminated as a timber tree in West Virginia. This picture shows the discoloration that is found in the outer sapwood of infected Elms.

The beetle imported before the disease, by itself, was harmless, but when it teamed up with the imported fungus which could carry it into healthy trees by tunneling, the duo became lethal. Native beetles can also carry the fungus.

These three diseases are killers and are still prevalent in the state.

Dogwood has a problem which may eliminate it from our forests. The oaks have Oak Wilt, another native disease discovered in 1950, that has the potential of being the most damaging since Chestnut Blight. However, unlike Chestnut Blight which is spread by the wind, Oak Wilt is spread by sap feeding beetles.

And then there are chronic problems such as the many decay causing fungi that come in after the tree is wounded by man, nature or forest fires. Decay may take as much as five percent of each year's forest growth on a statewide basis. Cutting just one side of a twin tree also incites decay.

There are as many noxious insects as there are disease organisms.

The American Beech and Eastern Hemlock both have specific imported insect problems that may remove them entirely from our forests and residential areas.

Gypsy Moth threatens most state trees (yellow-poplar is an exception). Forest managers spray whenever a serious infestation occurs, but quite often a biological insecticide, Bacillus thuringensis, is used and it has not proven to be a really good control. To me the insecticide Dimilin is by far the best, but environmentalists are in love with the buzzwords "biological control" as is used with the bacterial spray.

Gypsy Moth defoliation sometimes kills the tree outright and at other times just reduces the annual growth. Research has shown the manager that the hazard varies according to the percentage of oak in the stand and the direction that the slope faces.

Then there is the damage and hurt caused by fire, the suppression of which is one of forestry's and the nation's most hazardous occupations. This is especially true in steep topography such as characterizes our mountains. We attempt to fight fires in a cost beneficial way. To do this, the Division has prevention, detection and suppression programs. We are ever alert to the where, when, what, who, and why of fires. To do justice to the fire program would itself take an afternoon; so we will come back to it at a later time. Fires cause decay that results in millions of dollars of damage each year.

West Virginia had a very bad fire season in 1991. The Division mapped the fires and then took your Commission on a field trip to see the worst. With the Commissions help, several underground coal fires ignited by forest fires were subsequently extinguished.

Quite often people overlook the damage from fire. I well remember a news article a few years back that said fires did little damage. The writer later agreed that he had been wrong, but the damage from the initial writing continues. Even if the trees aren't killed outright, a fire will cause the annual growth to be stunted or even deleted. As an example, if your trees grow 200 board feet per acre per year and the growth is reduced by half, a bare minimum, you lose 100 board feet per acre for at least one year and probably two or three. If your forest is averaging 200 board feet per acre, even at today's prices this represents about \$50 per acre so the fire will cost you about that much per acre...\$25 the first year and \$12.50 each of the next two years. And there is the cost to the state. The loss is the severance tax that would have been collected plus the cost of suppression and the loss of future yields due to decay. It really adds up.

We won't say much about nematodes other than they pierce the smaller roots of trees and withdraw their daily rations. This results in un-thrifty trees and sometimes death.

Finally, we have the category "everything else". This includes damaged aesthetics, damaged recreation, damaged water quality, erosion control, nutritional changes, soil changes, animal damages, exotic plants and animals, air pollution, decay causing organisms, viruses and so on.

One of our bigger problems is the abundance of the white tail deer. Even the wildlife society believes that there are too many as this inch thick special issue of its journal indicates (on slide). This is a picture showing the lack of tree reproduction caused by too many deer. Only a pastured woodlot looks as bad. This picture shows what a well managed woodlot looks like.

Forest managers are really kept busy and they have to sacrifice to keep up to date. They do, however, have pertinent literature. In addition to the forest stands, Division foresters assist in managing urban forests. The Division once had a two day field trip for your Commission. The damages from 90% of the many pests and problems can be handled and lessened by the application of good silvicultural techniques. Such attention is needed through the life of the tree. If you just let a tree grow to harvest, you greatly decrease the value from what it could be if good silvicultural practices had been followed.

There are about 350 diseases and disorders caused by pathogens and environmental factors. In recent years many new diseases have been found and some that were totally insignificant a few years ago have become important.

Insect control is a dynamic field and changes in its technology come about frequently. Most manuals contain about 700 of the more common noxious insects.

I have just touched the tip of the many other forces that have greatly affected our forests. Unfortunately, man is short lived and most ladies and gentlemen don't much understand nature. The problem is that neither forest science nor the funding sources for science are reacting at all to the way forests are changing.

In the chronology of a forest, a decline taking 25 years is a sudden happening, but human consciousness does not see it that way. To many of us the change is so slow as to be unobservable. So we have people saying the forest has always been like this. When in truth it has been like this only for a short human lifespan or part of a life span. Forest managers manage for the future...sustainable forestry. If they do a good job, our children and their children will have good forests and a good healthy environment for centuries.

And let me repeat, good forest management based on good silviculture, takes care of all aspects of forestry...the soil, the trees, and all included organisms. It provides for man's shelter, some of his food, his clean water, much of his recreation, peace and solitude. As the saying goes, hug a forest manager, you will never go back to trees.

6. Dangerous Factors Affecting Forestry — Historic, Current, Future

The Dangerous Factors Study Group identified a total of 8 issues.

ISSUE 6-1: Currently the Division of Forestry has identified problematic fire areas existing in southern West Virginia bordering Kentucky as well as southeastern West Virginia bordering Virginia. These areas have traditionally had a much higher incidence of incendiary fires and underground mine fires than any other areas within the state and have on many occasions traversed county and state boundaries. These incendiary fires cause millions of dollars of damage each year to the forested lands within this state and impact all areas of the forest industry.

GOAL: Develop and implement a new strategic action plan for the high incendiary fire areas of the state. The plan is to involve the WV DOF, other agencies and the appropriate agencies in Virginia and Kentucky via the compact.

PROPOSED ACTIONS:

1. Initiate meetings with local and in-state law enforcement agencies, fire departments, out of state local and state law enforcement agencies, out of state forestry agencies and out of state bordering fire departments.
2. Utilize information gathered at meetings to gauge receptiveness and ability to assist in the development of a plan of action relating to available resources, necessary time to deploy and capabilities relating to high incendiary level areas. This plan will result in the formation of a “task force.”
3. Prepare all documentation relating to areas of responsibilities including but not limited to activation of the task force, equipment to include aircraft, manpower, training, travel, response time lines, public awareness campaign, current and future training needs related to the “task force”.
4. Require quarterly meetings of the formalized task force members to ensure up-to-date analysis and review of problematic areas, effectiveness of operations relating to fire reductions and prosecutions, public relations efforts, training and equipment needs.
5. Develop and implement electronic storage and retrieval of all information related to the high incendiary and mine related fire areas which will be utilized for analysis, assignment of assets within highest demonstrated need areas and assessment of effectiveness of efforts.

LEAD ORGANIZATION: WV DOF

SUPPORT ORGANIZATIONS: WVDNR, WVSP, USFS, FMRC, WVSA, VDOF, VSP, VSA, VDNR, VSFM, WVFSM

TIMELINES: Have actions implemented by December 2010

COST: To be supported by agency prioritization.

MEASUREMENT OF SUCCESS: Suggested actions implemented and desired reduction level in incendiary and mine related fires achieved.

ISSUE 6-2: West Virginia forests have hundreds of incendiary fires each year. These fires cause millions of dollars in damage. Successful prosecution is contingent on three (3) highly trained and nationally certified Wildland Fire Investigators. The work load is not manageable with currently available resources.

GOAL: Develop and implement a plan of action that will result in training Wildland Fire investigation techniques to current employees who will become “standby investigators”. As possible, create three (3) additional full time investigator positions within the Forestry Investigation unit.

PROPOSED ACTIONS:

1. Initiate additional training opportunities for full time uniformed employees of the DOF in Wildland Fire Investigation. Include origin and cause determination, scene preservation and investigation, evidence security, report writing, photography, court case preparation and case presentation, among others.
2. Utilize newly trained employees, as available, during times of “blow up”. These additionally trained employees will supplement current investigators, permitting them to focus on the larger and more demanding incendiary fires.
3. Acquire, as possible, three (3) additional full time investigators within the Investigation Unit.
4. Provide for the aforementioned training and all other necessary training and equipment as required for the additionally trained full time employees and the newly created Investigators and deploy assets in the most efficient and effective manner.
5. Require bi-annual retraining sessions of all full time and additionally trained employees in incendiary fire investigation.

LEAD ORGANIZATION: WV DOF

SUPPORT ORGANIZATIONS: USFS, NRCS, WVSP, WVDNR

TIME LINES: Have actions implemented by March 2011.

COSTS: To be absorbed by prioritization.

MEASUREMENT OF SUCCESS: Suggested actions implemented and functional

ISSUE 6-3: Improvement of Forest Fire Protection and Suppression Resources

GOAL: To improve Forest Fire Suppression resources in efforts to minimize and reduce the overall number of forest fires and the number of acres which these forest fires burn.

The WV DOF Forest Fire Program is divided into three aspects of Firefighting: Prevention, Preparedness and Suppression.

Prevention – The majority of the forest fires which occur in West Virginia are caused by humans and their activities in the forests. By educating citizens of the state, we can increase knowledge about forest fires and what people can do to prevent, reduce and minimize the size and number of forest fires.

Preparedness – Along with well trained firefighters, the equipment they rely on must be up-to-date and well maintained.

Suppression – With the use of well trained firefighters and other resources, suppressing a forest fire in a timely and efficient manner reduces the risk to human life, damage to personal property and damage to the environment.

PROPOSED ACTIONS:

1. Evaluate the need and prepare a plan to implement the use of additional employees when forest fire activity is at an elevated level.
2. Review the current WV DOF Forest Fire Warden System. This system was developed to increase the number of trained individuals who could detect and help suppress a forest fire. With the increased reliance on Volunteer Fire Departments, the Warden System is not maintained as it had been in the past.
3. Evaluate an increase in pay for firefighters. Compare a possible increase in pay to a possible increase or decrease in number of forest fires.
4. Improve Volunteer Fire Department Cooperation
5. Re-evaluate and improve the Federal Excess Property Program to provide equipment such as brush trucks and fire fighting gear and equipment.
6. Continue to provide fire fighting tools from the WV DOF.
7. Continue to provide firefighting training by the WV DOF.
8. Evaluate the need for an increase in fire detection systems in rural areas. This increase could improve response times and decrease the number of acres burned by forest fires specifically in rural areas which are difficult to access.
9. Evaluate a need for expanded implementation of the Wildland Urban Interface (WUI) and Fire Wise programs.

LEAD ORGANIZATION: WV DOF

SUPPORT ORGANIZATIONS: USDA Forest Service

TIMELINES: Have actions implemented by 2011

COST: To be absorbed by prioritization.

MEASUREMENT OF SUCCESS: A continued decrease in the yearly number of forest fires and a decreased number of acres burned.

ISSUE 6-4: Maintaining and operating Forest Health Protection Programs at the current level.

GOAL: To insure that the Forest Health Protection Programs are properly funded to insure the continuing protection of forest resources by providing an early warning system for non-native invasive species (diseases and insects).

The strategy is to maintain a uniform statewide survey program for forest insect and disease surveillance, abatement, suppression and eradication programs for the benefit of forest landowners and citizens of the state. (Non-native invasive species generally have few if any natural enemies in this country with which to keep their populations in check. Therefore, their populations if left unchecked can rapidly explode under the right conditions).

PROPOSED ACTIONS:

1. Continue pheromone and other attractant surveys for a variety of forest insects.
2. Seek advance approval for emergency legislative funding for programs in the event that USDA funding is discontinued or drastically reduced.
3. Continue statewide forest surveillance programs which include forest insect and disease surveys using random or predetermined plots.
4. Disseminate information on forest insects and diseases to foresters and other interested parties.
5. Review current and if necessary update MOUs.

LEAD ORGANIZATION(S): West Virginia Department of Agriculture

SUPPORT ORGANIZATION(S): West Virginia Division of Forestry, USDA-Forest Service, USDA-APHIS-PPQ, West Virginia University

TIMELINES: Continue surveys that are already conducted. Survey timing varies with the pest being investigated, but could be conducted any time during the year.

COST: In the event the USDA-Forest Service discontinues support for the forest health protection program, approximately \$250,000 would be needed each year to maintain surveys at the current level.

MEASUREMENT OF SUCCESS: The detection, monitoring and possible abatement of various forest pests.

ISSUE 6-5: Control of gypsy moth on cooperative lands.

GOAL: Minimize the adverse effects of gypsy moth.

The strategy is to maintain a statewide network to monitor and abate gypsy moth outbreaks in West Virginia. Federal dollars for gypsy moth cooperative suppression projects have been virtually eliminated; so it is becoming necessary to seek funding through the West Virginia State Legislature to cost share on gypsy moth treatment programs.

PROPOSED ACTIONS:

1. Seek advance legislative funding for gypsy moth control activity to cost share with landowners with the option to carry over unspent (used) funds to the next year.
2. Maintain the Cooperative State-County-Landowner gypsy moth program.
3. Request funding from the USDA-Forest Service to help fund the cooperative treatment program.
4. Use funds appropriated by the West Virginia State Legislature to supplement any federally appropriated dollars to fund gypsy moth cooperative suppression projects at a 50/50 cost share rate.
5. Continue to administer the Slow the Spread Program in West Virginia as long as the program is scientifically oriented.
6. Continue to emphasize that the forest resources (generally uninhabited forest land) in West Virginia are the number one priority in treating gypsy moth.
7. Develop statement to show probable treatment costs and probable savings per acre.

LEAD ORGANIZATION(S): West Virginia Department of Agriculture

SUPPORT ORGANIZATION(S): West Virginia Division of Forestry, USDA-Forest Service, USDA-APHIS-PPQ, West Virginia University

TIMELINES: July 2010 to continue yearly

COST: Over the past 10 years an average of 40,000 acres/year have been treated to protect timber from gypsy moth defoliation. Cost for treatment or suppression based on surveys could run from \$100,000 - \$3,000,000. An emergency carryover fund should be established starting at \$420,000 and be able to be used in succeeding years if not used in that particular year. Funding not used should carry over to lessen the landowner cost share in future years.

MEASUREMENT OF SUCCESS: Damage from gypsy moth eliminated or reduced to tolerable levels on cooperating lands.

ISSUE 6-6: Control of gypsy moth on cooperative lands.

GOAL: Minimize the adverse affects of gypsy moth.

Funding for gypsy moth suppression activities in West Virginia has been virtually eliminated by the USDA-Forest Service. In order to maintain a statewide network to monitor and abate gypsy moth outbreaks, the program needs dollars for its operations budget.

PROPOSED ACTIONS:

1. Conduct sign-up from June–August for gypsy moth suppression projects.
2. Continue to conduct egg mass surveys mid-August through October in preparation for gypsy moth suppression projects the following year.
3. Conduct pre-suppression aerial hazard surveys over proposed treatment blocks in March or April in advance of any aerial suppression activities.
4. Conduct aerial suppression project in May.
5. Conduct post suppression surveys on treatment blocks in June and July to determine the effectiveness of treatments.
6. Conduct aerial surveys in July and August to detect or delimit gypsy moth defoliation.
7. Prepare and bid the aerial suppression contract.

LEAD ORGANIZATION(S): West Virginia Department of Agriculture

SUPPORT ORGANIZATION(S): West Virginia Division of Forestry; West Virginia University; USDA-Forest Service; USDA-APHIS-PPQ

TIMELINES: 2009 – Continue all actions yearly

COST: Operations expenses to conduct surveys include mileage reimbursement, vehicle operations, lodging, meals, and flight time in observation aircraft, office space, cell phones, office supplies and equipment as needed. Annual operation expenses would total approximately \$300,000.

MEASUREMENT OF SUCCESS: Completion of surveys and activities in a timely fashion.

ISSUE 6-7: Broad changes in private forest land ownership are predicted for the near future.

GOAL: Ensure forest land owners are aware of inter-generational transfer or other options that could retain “forests as forests.”

The strategy is to outreach to forest landowners through Landowner Assistance foresters, targeted public information messages, technical resources to assist foresters and landowners in understanding and evaluating options.

PROPOSED ACTIONS:

1. Provide information/materials/training to WV DOF LOA foresters, and WVU Extension.
2. Utilize USDA-Forest Service public information materials for outreach to appropriate groups, forest related newsletters, and other venues.
3. Through above outreach, gather anecdotal or quantitative information on how private landowners are responding to this situation.

LEAD ORGANIZATION: West Virginia Division of Forestry

SUPPORT ORGANIZATION(S): West Virginia University; USDA-Forest Service; USDA-APHIS-PPQ

TIMELINES: 2009 – Continue all actions yearly

COST: Primarily a function of current service forester workload. Need for technical materials & public outreach — \$20,000/year

MEASUREMENT OF SUCCESS: Number of landowners contacted or requesting information.

ISSUE 6-8: Control and eradication of non-native invasive plants species in West Virginia's forests

GOAL: The global movement of materials has brought the threat of non-native invasive pests to West Virginia's forests. Establishing a detection and eradication program can minimize these threats.

PROPOSED ACTIONS:

1. Fund the position of Weed Specialist who will be responsible for conducting statewide surveys and bio-control abatement programs for non-native invasive weeds.
2. Provide information/materials/training to WV DOF LOA foresters, and WVU Extension.
3. Utilize USDA-Forest Service or WVDA public information materials for outreach to appropriate groups, forest related newsletters, and other venues.
4. Provide identification of weed specimens submitted to the Pest Identification Laboratory and provide landowners with information and control recommendations.
5. Provide biocontrol information and, as biocontrol agents become available, conduct tests and/or full scale releases as time and funding permit. (e.g. *Rhinoncomimus latipes* releases for mile-a-minute [*Polygonum perfoliatum*]).
6. Collect data on invasive plant locations through survey activities.

LEAD ORGANIZATION(S): West Virginia Department of Agriculture

SUPPORT ORGANIZATION(S): West Virginia Division of Forestry; West Virginia University; USDA-Forest Service; USDA-APHIS-PPQ

TIMELINES: 2009 – Continue actions 1 through 4 yearly. Actions 5 and 6 will be conducted during spring and summer as pest and biocontrol organisms become available.

COST: An Agricultural Weed Specialist will be utilized for program activities, management and supervision over seasonal employees conducting surveys. Funding should also cover information/education outreach materials, travel expenses for conducting surveys, biocontrol agent releases and monitoring. Program cost is estimated at \$75,000.00 per year.

MEASUREMENT OF SUCCESS: Number of landowners contacted or requesting information.

Number of biocontrol releases and establishment of those organisms.

Summary of State Forester's Report to FMRC on Reclamation of Damaged Lands to Forestry

The current goal for professional forest management in West Virginia is to provide maximum sustainable quality production on as many acres as possible. When professionally done, this keeps the overall ecology environmentally intact. However, since landscape management takes place within a social context, every day brings a new horizon for forestry. And every day also seems to bring a spurious environmental account, disseminated by compliant media, to ensnare the gullible. The struggle for power over the forest resource seems never ending. Currently, states are being asked to compete for federal funds previously distributed proportionately to states or based on a state's forested acreage. Competition is fine, but many of the reviewers are civil servants with degrees from allied disciplines with minimal training in forest science or more typical bureaucrats with training only in government. This fact, until proven otherwise for this specific administrative approach, will inculcate a degree of skepticism in biotic decisions especially if a "one size fits all" approach is adopted on a nationwide basis for distinctly different forested ecosystems.

The first requirement for intelligent decisions about forestry is to have an up-to-date quantifiable assessment of the forests and their environments with pluses and minuses recorded and reported on the same system, i. e., log scales. A complete assessment also goes beyond describing current conditions; it includes an analysis of the limitations placed on management options by the many physical, biologic, governmental and social factors.

The second requirement is to understand what has happened historically and why it happened. What are the ownership patterns? How is management achieved? Are there legal obstacles? What are the relative roles of noncommercial forestland, reserved timberland and commercial forestland? What percentages are owned by private corporations and private nonindustrial landowners? During what years was timber removed more rapidly than it was grown and what is the current situation? What percentage of the timberland is off limits by virtue of being on state and federal lands? How has wildlife influenced forest management over the years? In these days of ecosystem management, it's also important to know as much as possible about the past and present condition of the hundreds of species of wildflowers and other herbaceous and woody species growing on the forest floor, the many species of birds, the invertebrate species, the non-game vertebrate species etc.

The third requirement is to develop long term plans based on ecology and economics that sustain business development while protecting the environment. Here it's important to realize the absurdity of the notion that providing for the consumptive possibilities of future generations is more important than preventing the impoverishment of the present generation. It's also absurd to accept that certain pests "accidentally" brought into the state and flourishing uncontrolled cannot be eliminated, i. e. the Gypsy Moth, and that the damage caused by the white tail deer has to be accepted. The current damage to forests from deer is on the order of \$25 per acre per year.

Lands once laid bare for agriculture and since abandoned and lands currently being mined are being reforested, but both situations will require constant attention. In addition there are the hundreds of thousands of acres that have been mismanaged through high-grading and repeated nonprofessional harvests, repeatedly fire burned, insect damaged or degraded by poorly designed construction activities. Such lands need rejuvenation.

West Virginia's 12.4 million acres of forestland, about 78% of the state's surface, is unfortunately not all in a productive stage. Some of it is so poorly stocked that it will be decades before it is able to be used for commercial purposes, some has been so heavily harvested that there will be no sawlogs for decades, some is growing well but has very poor species and/or size stocking, and for some there is no advance planning for noxious insect and tree disease control. Thus, when planning for sustainable forestry, we are not thinking entirely of placing trees on currently vacant lands. We are also thinking of silvicultural policies and techniques that encourage the gradual recovery of all degraded forest systems. That's why current grandiose plans for building large plants to utilize great amounts of "biomass" without planning for other than total fiber production needs further study.

It's important to remember when growing trees as a crop, the amount that can be removed year after year is totally dependent upon the overall volume of timber on the site to which annual growth can be added. To insure subsequent commercial harvests, there must be a succession of age classes from seedlings to full-grown timber so that when trees are cut new trees of somewhat smaller size are present to take their place. In other words, when a high output of timber products is expected, a substantial volume of standing timber must be maintained as the "working capital (Larger trees growing wood at one-fourth inch per year add more volume than small trees growing at the same rate) ." Conversely, when the forest capital is liquidated, there is little capacity for the overall system to accrue merchantable growth.

The basis for sustainability is environmental responsibility built on the framework of environmental ethics. The core of sustainability is human commitment. It has no meaning unless the what-where-when-how-and who components are identified. There has to be specific plans for each tract.

In summary, the rejuvenation of West Virginia's forests requires approaches for newly bared land as well as excessively fire burned lands, high graded lands, insect and disease ravaged lands, etc. It will take fully trained professional foresters following overall plans implemented at the stand level and which are subject to modification as new scientific facts are discovered.

The forest resource in West Virginia is currently doing well. The future, however, will be, to a large extent, under current law, almost entirely dependent on a society that is generally scientifically challenged and out of touch with ecological concepts. In addition, the wildland-urban interface will complicate management. Forest recreation areas will be more crowded, exotic pests will increase, unchecked wildlife populations will destroy reproduction and the legal and regulatory environment will continue to develop, sometimes adversely. Through all of this, the need for wood will continue unabated.

The future is positive if everyone works together in a logical, planned way. The Strategic Plan you have asked for is the logical first step in the all important process of educating the populace about the ecology and management of forest resources. In this regard, the Forest Stewardship Program, an "educational" program for forest landowners authorized under the 1990 farm bill and funded through the U. S. Forest Service needs to better fulfill its intended goals of educating through workshops, field trips, demonstration areas, public service messages, and special publications in addition to the current financial assistance provided for preparing management plans.

7. Reclamation of Damaged Lands to Forestry

The Reclamation of Damaged Lands Study Group identified a total of 6 issues.

ISSUE 7-1: There is no overall valid assessment of damaged lands in West Virginia.

This study group's assignment is to be an idea generator in preparing a strategic plan for managing on damaged forest lands in the state. No emphasis will be on forest land that may have been damaged by poor forestry practices or mining activities.

GOAL: To develop a state wide inventory, by counties, of the extent of disturbed forest lands by major categories such as disturbance by natural catastrophes i.e. landslides and fires; by industries, such as timbering, oil and gas and coal developments, and by humans i.e., ATVs, mountain biking, illegal garbage dumps, etc. and to determine the acreage in need of restoration.

PROPOSED ACTIONS:

1. Develop a checklist of criteria for deciding restoration needs and prioritize them through use of the sustainability triangle — ecologically viable (environmentally sound), economically feasible (affordable), and socially desirable (politically acceptable).
2. Using the criteria checklist, develop the assessment and a suitable GIS based record keeping system.
3. Develop procedures for renovating each category of prioritization.
4. Develop site specific restoration plans with probable cost-benefit realizations.

LEAD ORGANIZATION: WV DOF

SUPPORT ORGANIZATIONS: WVOCS, WVDEP, WVDNR, WVU DFNR, NRCS, TNC, WVONGA, WVCA, WVDQA, WVL&MOC, WVFA.

TIMELINES: Plan on initiation of work early 2010; first aerial and then ground follow-up. Restoration 2010–2020.

COST: To be developed by study group and WV DOF.

MEASUREMENT OF SUCCESS: Successful conclusion of activities within budgetary estimates.

ISSUE 7-2: The current supply of hardwood seedlings for use in the reclamation of damaged lands in West Virginia is insufficient.

Seedlings grown in West Virginia, using local seed sources, are more ecologically adapted than are seedlings from outside the state. However, since reclamation is ongoing on mined lands, tree planting contractors have to acquire their seedlings from out of state sources, often from the deep South which has different climatic conditions. Approximately three million seedlings are needed annually for mine reclamation in the state.

The FMRC requests an annual report from DEP that projects strip mine reforestation needs (best estimates) each year for a three year period. The report shall be received from DEP by June 30 of each FY. The report will be updated annually as to drop the current year and add another year (for the 3rd year out). The report will include acreages, locations, numbers of properties, species recommendations (could be a range of or list of species), and any other pertinent information to enable the DOF Nursery to adequately plan for seedling production. The FMRC will forward a copy of the report to the DOF.

GOAL: Organize reclamation activities and seedling availability so that one complements the other with the overall goal of providing an adequate supply of native hardwood seedlings for mined land reclamation and other conservation practices.

PROPOSED ACTIONS:

1. Develop a system that monitors tree flowering and the climate to predict when and what seed crops may be available, the volume anticipated to be used, probable pricing, suitable advertising and the availability of future contracts.
2. Ask coal producers to contract with planters agreeing to use WV grown seedlings and to annually state the needs two years in advance.
3. Prepare a circular stating the ecological consequences of planting exotic species in the state.

LEAD ORGANIZATION: WV DOF

SUPPORT ORGANIZATIONS: USFS, WVDEP, WVCA, NRCS, WVU DFNR, WVL&MOA, TNC

TIMELINES: Initial steps started ASAP. Full operation by 2011.

COST: To be developed by WV DOF.

MEASUREMENT OF SUCCESS: One hundred percent planting for reclamation purposes of hardwoods from state sourcing.

ISSUE 7-3: Forestland owners and organizations lack of technical knowledge often leads to improper practices that greatly impact ecosystem and forest sustainability.

It is hoped that the development of a new strategic plan for forestry in West Virginia will result in all forest involvement being managed sustainably – that is according to the sustainability triangle... ecologically viable, economically feasible and socially desirable. It is, however, realized that the three legs are not always equal.

GOAL: Develop a popularly oriented pamphlet for use in landowner workshops showing that proper forest management removes the need for reclaiming damaged lands.

PROPOSED ACTIONS:

1. Prepare cost benefit data to show how improper roading leads to costly environmental tradeoffs, i.e., no forest crop for 80 years on affected area.
2. Suggest questions be added to the Timbering Operation Notification Form that will insure landowners have evaluated possible environmental damage.
3. Suggest cost benefit data be added to landowner workshops to show why Stewardship Planning is desirable.

LEAD ORGANIZATION: WV DOF

SUPPORT ORGANIZATIONS: WVDEP, WVDNR, WVCA, NRCS, USFS, WVOSM

TIMELINES: Have actions implemented by 2011.

COST: To be developed by WV DOF.

MEASUREMENT OF SUCCESS: Suggested actions implemented.

ISSUE 7-4: There are many acres of surface mined land, possibly 100,000 acres, where forest productivity levels have been drastically reduced. Many of these areas are in a state of arrested succession. Natural regeneration and succession is not occurring and growth rates of surviving trees are poor. Many of these sites are covered with exotic species of grasses, legumes and shrubs.

GOAL: Reestablish productive forest habitat through proper site preparation, incorporation of soil amendments, establishing tree compatible ground covers and by planting and protecting native hardwood seedlings for timber and wildlife considerations.

PROPOSED ACTIONS:

1. Develop a source of funding that will allow the offering of technical and financial assistance for mined land reforestation, including site preparation through ripping, soil amendments, ground cover establishment and tree planting.
2. Prepare a pamphlet explaining the cost benefits of mined land reclamation, how it can be done and features needed in contracting arrangements.

LEAD ORGANIZATION: WV DOF

SUPPORT ORGANIZATIONS: WVDEP, WVU DFNR, DOE, NRCS, USFS, WVFA

TIMELINES: Develop guidance committee to initiate cooperating agreements. Develop costs by acre by type of site, using probable cost sharing data.

COST: To be developed by WV DOF.

MEASUREMENT OF SUCCESS: Annual report showing year's goals met. Third party inspection after five years.

ISSUE 7-5: Forest fragmentation: West Virginia is losing forest land through industrial, residential, utility, and transportation development.

Forests are negatively impacted by development for housing, business, and industry. As this development proceeds, utility and transportation infrastructure provides necessary services to support these establishments, further impacting forest ecosystems. Forests are fragmented when land is converted from forest to other uses, including the expansion of urban areas, and results in fewer areas of continuous forest habitat that is thought to be necessary for certain wildlife species and ecosystem services. Forest parcelization occurs when a forested property is split into multiple ownerships and is linked to this issue because it can lead to residential development, loss in the ability to manage forested properties for interior forest wildlife species, and limited recreational access.

GOAL: To provide guidance to landowners, developers, legislators and community planners on methods for avoiding damage to trees and watersheds in industrial and residential developments.

PROPOSED ACTIONS:

1. Prepare a leaflet in popular language showing the many ways that ecosystems can be maintained while development is on-going and after it is completed. Use local examples of success and failure within diverse areas of West Virginia to bolster the effect. This action could be expanded to a state-sponsored educational program that actively engages community leaders and development designers to promote principles of sustainable design.
2. Have urban foresters monitor changes in urban development to set priorities for educational efforts.
3. Promote the Forest Legacy program handled by the WV DOF when contacting landowners about forest management assistance.
4. Use DOF/FIA cooperatively developed statistics to show the changing nature of forestland within the state each year.

LEAD ORGANIZATION: WV DOF

SUPPORT ORGANIZATIONS: WVFB, WVDNR, WV Assn. of Counties, WVFA, WVDOT, WVU DFNR, WVDEP, TNC

TIMELINES: To be developed.

COST: Some costs for outreach efforts under normal operating conditions can be absorbed internally; for an expanded program in this area, additional funds will be required. External state or federal funds will be needed for limited outside contracts.

MEASUREMENT OF SUCCESS: Workshops to offer guidance well attended. Program outcomes would be new residential, business, transportation and utility development with sustainable design elements (e.g., areas retaining or creating tree and green spaces) and lack of landscape damage.

ISSUE 7-6: Soils exposed during wildfire suppression are seldom reclaimed or stabilized.

Severe forest fires have been a problem in West Virginia for more than 150 years. In contrast to softwoods, fire has not been a natural part of the hardwood forest ecology. As A. B. Brooks (1910) said “There seems to have been little loss in the early years. Travelers and writers of the time who were familiar with the country seldom mention fire; and there is little evidence to be found in the condition of the woods to show that fire did much damage. Old “burns” — that means tracts of timber killed by fire — were few and small 50 years ago [1850] (Date added). ...Lighting has been shown to start fires, but very seldom in a climate like that of West Virginia.” The new settlers and the beginning forest industry changed all of that.

Most of the immediate ecologic damage from forest fires in West Virginia is to the soil. In the WV DOF publication by Atkins and Wimer, published in 1990, statistics are provided that show losses of 256 tons per acre of soil (roughly 12 pounds per square foot) during the first four months after the catastrophe with continuing losses approaching 212 tons per year for the next two years. As to decay in the tree, Hepting and others in 1935 proved conclusively that quality hardwood timber could not be grown if the trees are fire-scarred.

GOAL: Rehabilitate burned area in order to prevent erosion following fire suppression.

PROPOSED ACTIONS:

1. During fire crew training sessions, add instruction in the creating of water breaks on fire lines so that rainfall will be handled in small amounts and rapidly infiltrated.
2. Use the data collected in 1989 fires by Atkins, Circle and Wimer to prepare a leaflet showing the extreme losses, using the collected photos for illustrations, with discussions of probable soil and timber losses and the way to reclamation.

LEAD ORGANIZATION: WV DOF

SUPPORT ORGANIZATIONS: USFS, WVFB, WVFA

TIMELINES: To be determined by WV DOF.

COST: To be determined by WV DOF.

MEASUREMENT OF SUCCESS: Implementation of above actions.

Summary of State Forester's Report to FMRC on Urban Forestry — Land Management and Tourism

Urban forestry is the professional management of trees in urban settings. The purpose is to improve the urban environment by making it more environmentally and aesthetically appealing and safer.

The management goals are based on a combination of forest science and public attitudes and perceptions. The environment is especially challenging for trees due to limited root and canopy space, poor soils, too much or too little water, air pollution, excess heat, winter salting of streets, mechanical damage and people problems. It is exceedingly difficult forestry because it is usually underfunded and is seldom routinely considered and because people develop emotional attachments to trees making it sometimes difficult to remove or prune hazardous trees.

In West Virginia, the Division of Forestry *assisted* by the West Virginia Urban Forest Council, the Tree City USA program, Arbor Day participants, the WVU Extension Service, the U. S. Forest Service and others stand ready to offer assistance to any urban area. These organizations together provide a forum for learning and sharing of technical information about the value of urban trees and actively assists any group that wants to install urban forestry into community planning efforts.

Many of the prime plantings in West Virginia cities were made generations ago and, unfortunately, only a few have been well maintained. Many of the large, beautiful trees, some three and four feet in diameter and 90 feet tall, are actually diseased and in danger of falling. The widening of sidewalks and streets, the development of street side graveled parking areas for residents, the reconstruction of underground utilities, the importation of exotic insects and tree diseases, the burgeoning deer population now found in most cities etc., all have had and will continue to have a constantly widening effect as the years pass. Unless the attitudes of local policy makers change, foresters will be documenting an ongoing catastrophe rather than applying practical solutions to the problems.

Reconsideration is urgent as our urban forests are indirectly important in how the state is viewed by those seeking to relocate in the state, by those seeking to expand industrially in the state and very importantly by the tourists who may or may not revisit according to the impressions they have received. Urban forests are important to tourism because they are the vista nearest to the places that nights are spent. This is becoming even more important as tourists are traveling less, according to the American Tourist Association, with most traveling within a radius of 150 to 300 miles of their homes. Finally, trees increase property values because they enhance the attractiveness of a community. Urban trees greatly increase the quality of life, the number one item that is nearly always highlighted in industrial and tourism promotions.

Most of the 231 cities and 1,523 communities in West Virginia contain well developed trees. Sometimes they are just a few in front of the Court House and at other times they line the streets both in the business and the residential sections. It seems to me that the latter example is preferable. To develop in this way will take a much greater effort in this sub-discipline in the next several decades. The committee working on urban forestry for the strategic plan is accepting it as the beginning step.

8. Urban Forestry – Land Management and Tourism

The Urban Forestry Study Group identified 6 issues.

ISSUE 8-1: West Virginia citizens are not well informed as to what an urban forest does and can do to enhance their everyday life.

If asked, nearly everyone would point to the local park as an example of an urban forest. They probably do not understand that it consists of every tree or shrub growing within or nearby the municipality or city. They have probably never learned that such trees filter the air, provide shade, enhance property values, provide habitat for birds and small mammals. They know that they have to mow the lawn and dispose of trash, but few realize what they can do to keep the trees healthy. People generally acknowledge that they appreciate the trees, most of which were planted by the last generation. In fact, many of the better plantings are now approaching 100 years old. However, the planting of new trees has not kept pace with losses due to old age, disease, storms, city development, etc. Most citizens agree that the urban forest contributes greatly to the city and its desirability as a place to live. The social benefits are great. It seems, however, that the mix of ownerships among individuals and city, county and state officials results in little coordination of tree care and even less in funding at the level commensurate with the importance to the municipality

GOAL: To enhance efforts of the West Virginia Urban Forest Council that will enhance efforts to promote a public understanding of the need for trees and other natural resources in municipalities; to develop a general understanding of the value of their trees and of the proper ways to improve and renew the state's urban forests.

PROPOSED ACTIONS:

1. Develop a popularly written, concise West Virginia checklist of best management practices for the care of municipal trees and shrubs useful to the average citizen.
2. Develop a concise West Virginia checklist on how to select, purchase, install and care for urban forests.
3. Develop or adopt a questionnaire that can be used by any municipality to place a value on their trees.
4. Develop or adopt a checklist that shows how to protect the urban forest from and during the development process...on both public and private properties.
5. Attempt to interest cities to join the council whether or not they currently manage their urban forests.
6. Investigate the use of the AI Shigo brochure prepared for the WV Division of Forestry.
7. Develop an illustrated "how to" trimming guide for WV trees and shrubs. Describe in the introduction the harm done by indiscriminate trimming or butchering.

LEAD ORGANIZATION: WV DOF

SUPPORT ORGANIZATIONS: WVU DFNR, WVFA, WVFB, TNC, NRCS

TIMELINES: To be developed by WV DOF.

COST: To be developed by WV DOF.

MEASUREMENT OF SUCCESS: Financing of the Council, publications ready for distribution, schedule of meetings to inform landowners of the value of their forests and of the danger of doing nothing.

ISSUE 8-2: There are a lot of towns and cities in West Virginia that do not participate in Urban Forestry Programs even though it would be beneficial for their communities.

Trees are a natural resource whether they are on a mountainside, in a park, a road median, or along cities streets or in the yards of city residents. Trees in a city provide a range of climatic benefits, including noise reduction, shade, solar reflection, water retention etc. Trees also lower home heating costs if strategically placed. Trees improve the city's overall appearance and increase property values. The many positive benefits that trees provide to cities are enhanced when professionally managed so as to consider ecological and environmental considerations as well as social values.

The plantings in most of West Virginia's cities were made decades ago and some, mostly due to budgetary restrictions, have not been well maintained. Many of the large, beautiful, seemingly healthy trees are now diseased, in essence dying, and the widening of streets, placement of sidewalks and fences, development of graveled parking areas and other improvements has actually created hazards. In some West Virginia cities falling limbs have killed citizens and uprooting trees have greatly damaged homes and businesses.

GOAL: Provide dedicated funding in the Division's state budget which will greatly improve urban forestry activities across the state by providing start up money so cities can meet the 1:1 matching requirements for federal dollars.

PROPOSED ACTIONS:

1. Update a survey of state cities to develop a current list of the ones willing to professionally maintain their urban forests, but that do not have currently available resources. Rank these cities according to size and the percentage of the matching grant they might be able to provide.
2. Select one city in each population category and develop a budget to indicate what is needed for a professional program in each. Develop, concurrently, a list of benefits that would come from such management. Include immediate and long term management activities. Use volunteers, under sustained professional management, to conduct the surveys.
3. Develop four or five popularly written illustrated informational brochures stressing the benefits and giving locations (in or out of state) where such successes can be viewed.
4. Develop a cost estimate for the needed program in the priority cities, and present these estimates, minus what the city can subscribe, to appropriate legislators for support. Obtain advance information about the availability of federal grant money for each.

LEAD ORGANIZATION: WV DOF

SUPPORT ORGANIZATIONS: WVFA, FMRC, USFS, NRCS, WVFB, TNC, WVU DFNR

TIMELINES: Initiate in 2010. Have materials ready for inclusion in the strategic plan in early 2011, be an ongoing program by late 2012.

COST: To be determined by WV DOF.

MEASUREMENT OF SUCCESS: Steady increase in the number of municipalities with active programs. Increase in interest of joining in activities of the urban forest council.

ISSUE 8-3: Additional professionally trained personnel are needed to properly serve the urban forestry needs of West Virginia municipalities.

GOAL: To employ an additional Urban Forestry Technical Specialist (certified arborist) in the WV DOF so that technical assistance can be provided more promptly.

PROPOSED ACTIONS:

1. Using the data and cost benefit estimates provided through municipality surveys and the requests for assistance thereby generated, petition the state office for the hiring of additional personnel.
2. Acquire personnel to provide greatly expanded technical assistance to municipalities.
3. Acquire personnel to work actively to entice private and business donations to match municipality donations which jointly match federal grants.

LEAD ORGANIZATION: WV DOF

SUPPORT ORGANIZATIONS: WV UF Council, WVSU, WVU DFNR, TNC, WVFA

TIMELINES: Develop information on the critical need as soon as municipality data is in hand.

COST: To be determined by WV DOF.

MEASUREMENT OF SUCCESS: Successful procurement of a trained professional and letters of commendation from municipalities that have been assisted.

ISSUE 8-4: West Virginia has joined in the multi-state Chesapeake Bay Initiative (CBI), but there is no formal urban forestry program included.

The CBI involves watersheds (drainages) that ultimately become part of the Chesapeake Bay. The CBI is a program designed to protect the Bay from negative impacts that will further degrade the resource. The Potomac River and tributaries in the eastern panhandle of West Virginia are now included in the initiative.

GOAL: Develop an overall urban forestry plan for the municipalities within the Potomac River Basin area in West Virginia that will enable them to jointly become an active part of the CBI.

PROPOSED ACTIONS:

1. Develop workshops to show the necessity for additional activity.
2. Develop urban forestry canopy goals.
3. Fine tune overall urban forestry goals for greater CBI special needs effect.
4. After the program is operative, use developed needs and municipality response to solicit state funding for the CBI forester position.

LEAD ORGANIZATION: WV DOF

SUPPORT ORGANIZATIONS: WVCA, DEP, CBI implementation committee, Potomac Valley Project Community Tree, USFS, WV Stream Partners Program

TIMELINES: To be developed by WV DOF.

COST: To be developed WV DOF.

MEASUREMENT OF SUCCESS: Development of data, preparation of an overall plan and continuation of CB forester via state funding.

ISSUE 8-5: West Virginia's urban forests are currently threatened and could be greatly harmed by invasive exotic plants, tree diseases and noxious insects.

The trees in urban forests are more subject to insect and disease problems than their commercial forest counterparts due to the stressful environmental conditions. Quite often, municipal trees will succumb to attacks that their forest cousins would be able to endure. For this reason, it is important to periodically examine urban trees to find such problems while they are still in the incipient stage. Invasive plants are a different problem in that they affect the environment and not the urban trees themselves. In such situations it is vital that they be removed because of the aesthetics of the urban forest and because they can be carried by visitors to other localities.

GOAL: Reduce the impact of noxious pests in urban forests.

PROPOSED ACTIONS:

1. Work closely with the DOF's forest stewardship foresters and with WV DOA insect and disease personnel in deciding on survey techniques that can be taught to municipal personnel who can serve as the first warning entity. Jointly develop illustrated circulars on the most pressing pests that can be used in training workshops.
2. Train municipality personnel in control measures including providing listings of professional pest exterminators that do the required work and the costs of same. Maintain constant contact via reports with WVDOA, WVU DFNR and WVDNR.

LEAD ORGANIZATION: WV DOF

SUPPORT ORGANIZATIONS: Municipalities, WVDOA, WVDNR, WVU DFNR, USFS

TIMELINES: Continue current activity and increase activity as needed.

COST: To be developed by WV DOF.

MEASUREMENT OF SUCCESS: Lack of quarantines, legal actions and extreme dollar losses.

ISSUE 8-6: The role of the urban forest in tourist attraction, particularly re-visitation, is often overlooked, but is actually one of the most important aspects of the state's environment.

Many of West Virginia's approximately 231 cities and towns and 1,523 communities, herein termed municipalities, contain well developed urban forests. Sometimes they are just a few trees in front of a Court House, sometimes they are just trees in residential settings, but when well maintained they have a tremendous visual impact on visitors whether they are there to view a historical oddity or to visit friends and relatives.

As mentioned in the urban forestry strategic 5-year plan of 1992 (WV DOF TR-92-2), the main drive of the urban forestry program was to create a consciousness among the citizens of West Virginia as to the value of the trees in and around their communities and the need for proper maintenance of these resources. One idea is to make the state look the best it can at all times and to spruce up the area around historic places that might serve as niche markets for tourism. There are problems that have to be overcome. According to the American Tourist Association, Americans vacation about 4 days each year. About half of all personal trips in the US are made within a 300-mile radius of the traveler's home and more than one-third are within 150 miles. A year or two ago, it was found that trips are getting shorter in duration with 40 percent less than three nights in length. Much of this is because visiting friends and family is still the number one reason people travel.

How do urban forests tie in to tourism when they are a small part of the vast green mountainsides? They do because they are the vista nearest to the places nights are spent. Consider fall color. Trees under stress color early and the color is gone or fading before the hillsides become alive with color. The symptoms associated with early color are usually root or soil related. Drought, girdling roots, nutrient deficiencies, excess water, and root rot are all problems that a good urban forest maintenance program will retard or even stop. Diseases cause early leaf drop as is seen on ornamental and native buckeyes. Prevention is the key to dealing with early fall color and an accurate diagnosis by a professional forester is key.

GOAL: To assemble data that will show how urban forests impact, both negatively and positively, the idea of tourism as an economic industry in West Virginia.

PROPOSED ACTIONS:

1. Offer advice to economic development groups on ways to better maintain the trees around their historic or other tourist sites so they will be more appealing to visitors.
2. Institute a series of town meetings to walk the streets and give free advice on how to better maintain the trees and shrubs.
3. Urban forestry is a small part of forestry in the state, but it is a large part of the forest that a citizen actually sees. Cooperate with the other units of forestry to provide a balanced approach.

LEAD ORGANIZATION: WV DOF

SUPPORT ORGANIZATIONS: WVU DFNR, NRCS, TNC, WVFB, WVDOA

TIMELINES: Begin cooperative efforts immediately.

COST: To be developed by WV DOF.

MEASUREMENT OF SUCCESS: Public realization that the trees in municipalities have a lot to do with whether people from outside their immediate sphere like what they see.

Summary of State Forester's Report to FMRC on Regeneration of Forests in West Virginia

The necessity for providing advanced tree reproduction before harvesting the current stand of timber *is the most overlooked* aspect of forest management. This is especially true for northern red oak and white oaks because harvests are commonly made even though there is a lack of advanced oak seedlings throughout the stand. Consequently, the probability of producing a follow-up oak stand is relatively low and oak is replaced by trees such as red maple that have less timber and wildlife values. This is shown by the recent USFS statewide inventories showing a steadily decreasing red oak base and a steadily increasing red maple component. Further proof is the census records that show white oak to be the number one tree in the state in 1880 versus its current fifth or sixth place ranking in 2009. Red maple, hardly heard of in 1880 is now the number one tree in the state. Red oak has also decreased in number. Part of this is due to the low incidence of fire compared to a century ago. (Red oak has buds on the root collar an inch or so below the forest floor, so it can resprout after a fire.) Deer browsing is also a problem for many species.

From the professional forestry viewpoint, it is important to have advanced oak seedlings on the forest floor before the stand is harvested. This often takes several years of preharvest silvicultural treatments to develop, especially on sites not under strict professional management. The USFS – WV DOF – WVFA sponsored a week-long class [taught by USDA researchers] *Ecology and Silviculture of Mixed Oak Forests* and a similar *Ecology and Silviculture of Northern Hardwood Forests*, is the professional response to the need for correction.

In essence, growing trees is as much crop culture as is growing corn. If you start a corn crop, but let the weeds take over, don't sucker out excess plants, don't control the insects and diseases, don't keep deer and raccoons out, you have a miserable crop hardly worth shucking — about 20 bushels to the acre. Your neighbor, at the same time, using the tried and true cultural techniques, harvests 150 or more bushels to the acre. As a comparison, you have a forest, but don't remove the weedy species, don't control the insects (such as Gypsy Moth), don't control the tree diseases, don't thin the stand to allow the better trees more growing room, don't keep fire out of the woods, you ultimately get a crop of about 3,000 board feet of low value logs per acre. Your neighbor, doing all the professionally correct things, harvests 10,000 board feet per acre of top quality logs in the same time frame. In addition, he will have established a sustainable forest from which such crops can be grown in perpetuity.

I am not here to make foresters out of you, but I do want you, as the state's policy makers, to understand that the state's No. 1 crop, trees, must be grown professionally and not haphazardly if we are to have sustainability and if we are to engage in certification. We can't have one without the other.

Let's briefly review how we got to the present situation.

Before the Europeans arrived in what is now West Virginia, the makeup of the forests for thousands of years had been determined by climate, ice, storms, insects and tree diseases helped along by the vast fires set twice yearly by the Indians. What they found was in no way virgin forest.

When European diseases disseminated Indian populations in the early 1500s, the forests grew back on the Indian village sites, crop lands and hunting grounds. Thus, when West Virginia was first settled, the forested area had seen nearly 200 years of unimpeded growth. The settlers thought that what they were seeing had been there forever. It, of course, had not.

The new settlers had no crop land. The forests were a nuisance and a hindrance to life. Cleared land was worth more than land with trees. The axe was the tool of the moment. Some trees were cut and burned and others were ringed and left to die. Primitive water powered mills were soon established, but with only horses and oxen to move logs they were not too successful.

The improved crosscut saw arrived about 1870 and helped a lot, but timbering, except for a few river drives in the pine areas, did not become common until Henry Ford began to mass produce trucks (1908) and the Shay and Climax locomotives were in common use.

Massive fires in the early 20th century again drew attention to the forests, but there was no management pointing towards future crops. The hiatus occurring after the forests were removed by the settlers lengthened with WW I, the depression and finally WW II. There were no foresters and the property tax situation (confiscatory) was such that large landowners often cut the timber and then let the land be sold for taxes. This was how the Monongahela National Forest acquired a lot of its land. One tract, now the Gauley Ranger District, exceeded 250,000 acres. It was sold for \$2.50 per acre. Forest Management was not recognized politically as being important to the state or the nation.

Limited forestry work in the 1930s by the Civilian Conservation Corps, usually primitive and quite often unsuccessful, slowly got the public and its representatives thinking about the future.

Pilot projects, started after WW II, when forestry gradually gave assistance to private landowners, although short-lived, were usually termed successful.

Some forest management was started on state-owned forests in the 1950s, but intensified timber management just never seemed to get in high gear.

The federal government restarted the Fernow Experimental Forest near Parsons in 1949, shortly after the first consulting forester (1946) in West Virginia, Jack Tillinghast, began work in Raleigh and Boone Counties.

Current foresters must also consider the growing demand for the many non-consumptive services provided by forests. These include wildlife habitat, outdoor recreation, aesthetic values, and other environmental amenities that result from healthy forest ecosystems. This has helped to point out that economic analysis, properly conducted, is a framework for critical planning; poorly done, it is a smokescreen for special interests.

There is, however, a shift in the way the public and forest managers alike view their responsibilities for forest stewardship. They are now seen as the provider of environmental services as well as a provider of goods. The changes in social agendas are resulting in changes in forest management practices.

Let me emphasize again that the key to facilitating good reproduction is to plan for it. The specie's biological and ecological characteristics are the roadmap to success. These must be understood and followed. In other words, you can't just cut trees when they are needed at the mill. The harvest must be planned well in advance and the regeneration must be on hand before the harvest is made. To do otherwise is to be penny wise and pound foolish. Such practices may get the current manager to retirement, but a sustainable future for the forest is dimmed.

And, there can be problems. Entire seed crops can be destroyed by insects and/or wildlife.

Many current managers rely on stump sprouts and this may work for young vigorous trees as sprouting is regulated by tree size and age. However, 20" stumps are the cut off size, above which many species won't sprout. Red oak sprouts readily up to 20 inches and 60-80 years of age, but seldom above this level.

The ability of hardwoods to sprout after repeated browsing is a plus. Deer are especially harmful in West Virginia on certain species. One study in the 1950s where deer numbered 15 per square mile showed that birch disappeared from the forest after about five years. This is bad for the ecosystem. Hard maple does better and red oak is not too far behind.

Other factors to be considered are:

Large trees have scenic attractions and some should be left in every stand.

Wildlife and timber are both important and both must be taken into account before harvesting is started.

Mills must begin to plan in advance. On sales where the land is under the managed timberland tax incentive and/or the Sustainable Forestry Initiative or any of the similar programs, the purchasing entity must follow sound silvicultural guidelines pointing towards sustainable forestry. In a few instances in other states, the mills are said to have the responsibility of monitoring the harvest practices of those delivering wood to the mill. On sales they purchase from private landowners, the stands must be conditioned for harvest before the cut is contemplated. This is complicated when the timber is on a tract owned by a private landowner, but such conditioning, based on a written plan, is the only way that sustainability can be assured and be proven for certification. This can perhaps be supplied by Registered Professional Foresters operating under professional guidelines and a Code of Ethics.

Finally, the gist of growing hardwoods has been compiled in two very good books that no forester should be without. These are:

Johnson, Paul S. Shifley, Stephen R. and Rogers, R. 2002. The ecology and silviculture of oaks. CABI Publishing. 503 p. [New edition Oct. 15, 2009]

McShea, William J. and William M. Healy. 2002. Oak forest ecosystems. – ecology and management for wildlife. John Hopkins University Press. 450 p.

9. Regeneration of Forests in West Virginia

The Regeneration of Forests Study Group identified a total of 4 issues.

ISSUE 9-1: For several decades, forest inventories have indicated that oaks are being replaced by other species in West Virginia forests.

The most recent inventory indicates that oak species continue to lose ground to other species in West Virginia oak forests. Several research papers emphasize that successful oak management is possible only if there are advanced oak seedlings present at the time the oak overstory is harvested. In general, oaks have two requirements for successful regeneration and management leading to saw log timber. Both depend on what is present when the harvest cut is made. The first is that competitive sources of oak regeneration must be present (advance regeneration) or ready to be generated (stump sprouts) and the second is that the oak regeneration has to be released in a timely manner. In other words, silvicultural activities must be properly applied at appropriate intervals so that harvested trees are replaced by new regeneration of the same species.

GOAL: Educate forestry professionals and landowners about the importance of preparing for desirable regeneration before mature trees are harvested.

PROPOSED ACTIONS:

1. Emphasize the need for regeneration inventories and stewardship plans before harvest operations.
2. Require DOF foresters to attend SILVAH-Oak workshops taught by the U. S. Forest Service.
3. Publish a newsletter approach to the forest industry that shows the need for planning for reproduction through professionally prepared forest management plans before the harvest is conducted.
4. Initiate an informal reproduction survey that can be conducted while examining the BMPs on a logging operation to determine if adequate advanced regeneration is present.

LEAD ORGANIZATION: WV DOF, WVU DFNR

SUPPORT ORGANIZATIONS: WVFA, WVFB, NRCS, TNC

TIMELINES: To be developed by WV DOF.

COST: To be developed by WV DOF.

MEASUREMENT OF SUCCESS: Actions completed.

ISSUE 9-2: There is a need to recognize and rehabilitate degraded hardwood stands so that new reproduction of desirable tree species can be established.

A degraded stand is one with fire-scarred trees and trees with poor form due to overtopping and/or poor genetics. A small tree is not necessarily a vigorous tree that will grow into the large trees of the future, although this is a popular misconception. Stands are degraded via repeat forest fires without damaged tree removal and continually harvesting the large trees without first assuring adequate reproduction. Insects and tree diseases may also degrade stands.

With the advent of markets for low quality wood products this situation should have been reconciled, but indications are that it has not. A brief survey shows that continually harvesting high value trees, for short-term economic gain instead of long-term sustainability, has created hundreds of thousands of high-graded stands in West Virginia.

GOAL: To develop guidelines and incentives to enable landowners to improve degraded forests.

PROPOSED ACTIONS:

1. Develop workshops to recognize and rehabilitate degraded stands.
2. Develop ways of deciding whether the stand has adequate growing stock and whether artificial or natural regeneration should be the solution.
3. Develop a checklist to use in deciding whether there are alternative management options for forest on upper ridges and on heavily eroded soils where tree volume growth is normally slow. Alternative uses would include wildlife habitat and other landscape-scale uses.

LEAD ORGANIZATIONS: WV DOF, WVFA

SUPPORT ORGANIZATIONS: WVU DFNR, USFS

TIMELINES: To be determined by WV DOF and WVU DFNR.

COST: To be determined by WV DOF.

MEASUREMENT OF SUCCESS: Actions completed.

ISSUE 9-3: Service foresters, landowners, and consultants need an updated field guide for regenerating hardwood forests.

Tree species differ in their frequency of producing seed crops, the longevity of their seed in the forest floor, and their requirements for light, water, and nutrients for successful regeneration. In West Virginia, more than 25 hardwood species and 10 softwood species are important components of the forest. Critical information for each species is available in large silvics manuals published by the US Forest Service and in dozens of scientific papers produced since those manuals were last revised in the 1980s. A condensed summary of silvical information is needed so that land managers have ready access to key information as they plan forest management activities.

GOAL: To make basic silvical information generally and popularly available to professional foresters and landowners alike for use in assessing tree reproduction alternatives.

PROPOSED ACTIONS:

1. Prepare a field guide for regenerating forests in West Virginia, including tables, figures, and photos that summarize the critical information needed to write forest management prescriptions.
2. Distribute the field manual to service foresters, landowners, and consultants so that communication among these groups is facilitated.

LEAD ORGANIZATIONS: WV DOF, WVU DFNR

SUPPORT ORGANIZATIONS: WVFA, WVFB, NRCS, TNC

TIMELINES: Initiate preparation in 2010, complete in 2011.

COST: Internal and to be developed when draft is ready.

MEASUREMENT OF SUCCESS: Manual developed and distributed.

ISSUE 9-4: The public needs more information on the ecology and sustainability of hardwood forests to promote a sustainable management of forests across the state of West Virginia.

GOAL: To educate the public on the natural perpetuation of professionally managed sustainable hardwood forests.

PROPOSED ACTIONS:

1. Publish a popular circular that describes the life of a hardwood forest and how it should be prepared for harvest.
2. Publish key ecological information as a series and make it available on the internet so landowners and land managers will always have ready access to vital information.

LEAD ORGANIZATIONS: WV DOF, WVU DFNR

SUPPORT ORGANIZATIONS: WVFA, WVFB, TNC, NRCS, DNR

TIMELINES: Initiate in 2010.

COST: To be developed by WV DOF after soliciting ideas.

MEASUREMENT OF SUCCESS: Leaflet distributed.

Summary of State Forester's Report to FMRC on Silviculture and Tree Marking Guides for Managing WV Forests

The practice of silviculture is more than 200 years old. Although it is the heart of forest management, it has been in a midlife crisis as the goals and assumptions are re-examined according to new ecological ideas and in response to public pressure to manage ecosystems instead of a strict "farming for wood."

This is in no way downplaying the crucial role of commodity production as a worthwhile and most outstanding management goal. As long as humans use wood, the production of wood will be necessary. However, we have also learned that forest practices that are economically and environmentally sound, but aesthetically unacceptable to the public either have to be modified or abandoned.

As to silviculture, it is simply tending the forest, using scientific guidelines, to produce the commodities the landowner desires.

The foundation of silviculture is silvics - the characteristics, life histories and ecology of trees. A forest is complex and as we began to manage for complexity, silvics has expanded into a study of the entire ecosystem. Today's practicing forester has to consider the organisms in the soil, all tree species whether or not they are merchantable, the shrubs, the birds, nongame and game mammals, the climate, the effects of elevation, the response to aspect, disturbances etc. This is sometimes frustrating, but it is absolutely necessary when selling logs and lumber worldwide.

The new way of thinking about forests is that they have to be perpetuated, maintained forever by human effort employing scientific management methods applied by trained professionals.

Silviculture uses both intermediate and regenerating treatments.

Intermediate treatment involves thinning to reduce competition for the better trees, sometimes termed crop tree release. This allows sunlight to arrive on all four sides of a tree, in a coniferous plantation, pruning is another intermediate treatment used to ensure more clear wood.

Regeneration treatment is the planned removal of the existing stand in a way that will insure the reestablishment of the forest. Adequate reproduction is necessary if the forest is to be certified as perpetual as now demanded by foreign markets. Among the various treatments are the seed tree or shelterwood method, clearcut method, single tree selection method, and group selection. This is another way of showing the procedures. In using these techniques, it is necessary to consider trees in all four of the forests crown classes— dominant, co-dominant, intermediate and suppressed and to decide, on the basis of biology whether they are to be harvested, retained or considered culls. The four size classes- seedling, sapling, pole timber and sawtimber are all evaluated.

When these items have been considered, the forester prepares summaries of the number of trees per acre by size classes, percentage of the stand in each crown class, estimations of the danger from gypsy moth, the various other imported pests and weeds etc., and begins to make the decisions that lead to woodland improvement and the landowner's goals. This is the practice of forestry, a complex science for a complex subject. We use data for the individual tract and for the stand. These graphs show the data can also be used for comparative purposes. When all of the data is in hand, it is time to make the necessary decisions.

Let me again emphasize that the particular silvicultural system one uses depends largely on the long- and short-term goals for the forest stand. The common goal is usually long-term economic return from sustainably harvested timber. In other words, the removal or harvest of selected trees over time while protecting the aesthetic appearance and ecological integrity of the stand, encouraging the growth of certain tree species and providing habitat for a diversity of wildlife.

Let me also mention carbon sequestration which is much in the news these days. Currently, there are no data for hardwood forests in general. There has been a lot of guesswork and the Canadians have done quite a bit of work on conifers. We do know for certain that the amount of CO₂ in the atmosphere has not been as low as it currently is during the last half billion years. We currently don't believe that anyone will get rich sequestering carbon, mainly because the scientists tell us there is no need for it to occur. Some, however, see it as an extra source of income and some would love to be paid to work on the supposed problem. Our analysis doesn't appear as rosy. A great amount of work lies ahead for those proving otherwise.

The chosen silvicultural system is put into play only after all of what we have discussed is analyzed and found to be pertinent to the forest being worked.

Are there problems? Sure. The stand may be in extremely poor shape from fire, previous insect or disease attacks, 4-wheelers, wind storms, and from man himself trying to take shortcuts.

This only means that it takes longer to get a merchantable crop.

Unless specially trained, people sometimes don't think much about their trees. The current generation mostly inherited the land or purchased it while they were young. In either event, trees have appeared on the land, even in old fields. The owners have watched them grow with no investment except taxes which aren't too high if you also live on the property. Then, years later, someone makes an offer for the trees and the decision is whether to sell or not sell. Since there has been little investment of time or capital, it seems like a gold mine and a sale is agreed. After all, the buyer is only going to cut the larger trees – down to 14 inches.

And that is the first problem. The only evidence left behind after the harvest is the stump and it is usually two inches larger than the tree was at 4.5 feet, where measurements are usually taken. Consequently, 12" trees may be cut with impunity. And, since the contract does not specify care be taken in the cutting, the residual stand may be greatly injured by falling trees. The cutting of all of the larger trees and the wounding of several of the residual trees destroys any effort at sustainability and this is very important in these days of certification – if you want to sell timber.

As to certification, in the earlier years there was an oak wilt quarantine on West Virginia and oak trees could not be exported from any county in which the disease had been found. I have been told that for years all oak sold in West Virginia was certified as being from Webster County, the only oak wilt free county in the state. I doubt that will happen with certification.

Diameter-limit cutting is an integral part of West Virginia's forest history. More than 90% of the stands of the last decade have been cut in this way and most still are. As a result, the current stands contain low quality stems, less valuable species, spotty stocking and has no real future. The question becomes, "are we practicing forestry or just harvesting timber." To practice forestry, one needs to monitor forest health, maintain appropriate levels of stocking and insure that there is advance reproduction before the harvest cut is made. Studies have shown that repeated diameter-limit cutting

results in less than one-half the level of revenue over a rotation age of 60-80 years. Another problem is that diameter-limit cutting removes the best trees of the older age classes and seed that is needed to renew the stand has to come from the remaining poor-quality trees. After two or three diameter-limit cuts, the only solution is to clearcut the forest, prepare the site and reseed or plant. In such cases, sustainable forestry is no longer a possibility and certification can't be acquired. If market forces continue to drive towards certification of commercial forests, as is now occurring, the average landowner will not have markets.

Finally, we don't want to forget what we are selling. It pays to be patient and to use good silviculture. For example, a black cherry or northern red oak or sugar maple 16" dbh with no defects has taken from 30 to 50 years to reach that size. Given another 15 – 18 years, these trees will double in volume and increase in value by as much as 400%. There are few investments that can do that. That's why good forest management and good silviculture are so important.

Thank You.

TREE MARKING

Today's discussion of tree marking is an extension of last month's talk on silviculture as tree marking combines a knowledge of the research literature with practical knowledge and experience that makes silviculture function effectively in timber management operations. Tree marking for harvest and/or timber stand improvement requires the combined skills of all forest management operations.

In brief, tree marking is as much an art as it is a science. It requires the interpretation, application and integration of biology, ecology, economic and aesthetic concepts as each and every tree is marked for removal.

Past high grading for the best-quality timber, heavy cutting for pulp and fuel wood markets and such natural items as fire, wind, ice, insects, and diseases bring complications in stand structure, stand stocking, species types, bole quality, etc.

As mentioned last month, silviculture is a planned series of treatments to modify and improve the forest so that it can be better utilized and so that it will achieve maximum growth and quality while taking care of the wildlife and all other ecological considerations. Logging is the main tool by which stands are manipulated to enhance future crops and other forest values. Tree marking is the mechanism that brings about such regulated stand disturbances. It is the basis of sustainable forestry which in turn is the basis of certifiable forest management which is the ultimate proof that no aspect of the overall site ecology has been impaired.

Let me emphasize again that a "continuous forest" is one that is manipulated periodically and simultaneously by professional harvesting, renewal and maintenance procedures.

The tree species characteristics are most important in tree marking. Yellow-poplar does not grow as red oak as white pine. Each has characteristics that dictate what the forester has to do. Does it sprout from the stump? How often are seed crops produced? Will the tree do well in shade? Does the species prune itself thus producing defect free stems? Will it grow on any site or does it require a specific type of soil and amount of moisture? Is it subject to damage by spring fires, fall fires, both or neither? What is the target mean diameter for the species?

Tree marking is based on a pre-harvest timber inventory or cruise. This establishes how much is there, the quality, how much of each size can be removed in meeting the overall forest management objectives and the extent of any past damages.

The biggest decision is not which trees to cut, that is the second most important decision. The first is which trees should be left. Which will produce the best offspring? Residuals left as reproduction need to be vigorous with good crowns, in relatively un-crowded situations, good bark features, that will survive and grow over the next cutting cycle.

Stressed trees, those that have been defoliated by insects may die or deteriorate by the next cycle. In high-graded stands, it is often necessary to leave trees of modest quality. Safety dictates that dead cull trees be cut during the timbering operation. Forest management dictates that living cull trees will die to replace the needed wildlife condominiums. Dick Trimble, at the Fernow Forest, showed that 39% of residual cull trees larger than seven inches died within five years of harvesting and 46% were dead within 10 years, primarily, he thought, due to exposure shock.

Tree health is all important in deciding on which trees to leave.

Is there dieback in the crown? Are there just a few large twigs or many smaller ones? Are their noticeable physical defects? Is there evidence of decay? Is sprouting evident?

In classifying the tree as to whether it can be or should be left, both current and potential quality are important. The decision should not be based on utilization standards as both mill technology and market value can and will change with the years. Grade should be used sparingly, if at all and size limitations (diameter and merchantable length) either sparingly or not at all.

It is important to consider shade tolerances, excessive lean or exposure, fungi fruiting bodies, crown vigor, and whether or not the tree is needed for stand stocking levels.

The number of trees per acre, the distribution of trees within each acre, size and shape of openings in the forest canopy, and how long will it take to achieve a closed canopy after harvesting are all very important as the forester strives for a stand that has trees well balanced in all sizes.

After the cruise is completed, the forester graphs what has been found and compares it to what is optimal for the stand...number of trees per acre or hectare, size of trees, etc., and prepares a marking prescription that will result in a harvest that insures the renewal and maintenance of a stand. The prescription is not concrete; it is not absolute, but it is the working hypothesis on which the biological, ecological, economic and social decisions are made. In other words, in working with stands it is impossible to develop the "ideal" stand throughout the area at any one time. However, one should strive for an average situation overall.

Tree marking must be done for any partial cut. It is not necessary on clear cuts, but they too are studied for size and aspect layout.

Poor marking wastes money and wastes the stand. Poor or no marking defeats sustainability and negates any effort at certification.

10. Silviculture and Tree Marking Guides for Managing WV Forests

The Silviculture and Tree Marking Guides Study Groups identified a total of 8 issues.

ISSUE 10-1: There is a need for a comprehensive silvicultural guide for managing forests in West Virginia.

West Virginia forests are a bit different than those of the surrounding states. The state is small and has a lot of forestland, but it also has a highly developed economy in which forestry plays a relatively small part. Harvesting, timber processing and secondary forest product industries employ a smaller proportion of the total workforce than in neighboring states. There is a world of information available from research centers like the Fernow Laboratory, but only a few know of it. There has been no synthesis and the desire to limit college hours has meant that rigid silvicultural training has decreased in recent decades. Good forestry practice refers to silviculture that is performed in ways that maintains the stands ecological processes, continues wildlife habitats, while growing high quality trees for lumber. Silvicultural guides, based on scientific research and/or analysis provide the forest manager with information essential to the planning, development and implementation of ecologically sustainable silvicultural practices. Such a guide and evidence that it is followed will go far in offsetting the developing public belief that such practices be mandated by law in order to provide for the protection of all forest values, not just timber extraction.

GOAL: Prepare a silvicultural guide that will represent the best practices in the different regions as based on current knowledge and experience. Specific questions include how to protect stand components, minimize environmental damage, maintain wildlife habitats, be basic to forest sustainability, and provide good economic benefits to landowners.

PROPOSED ACTIONS:

1. Form a group of professional foresters active in forest management and forest research to prepare suggestions as to what should be contained in such a manual and produce a list of scientific papers that will show how the activities should be done.
2. Work in conjunction with a group preparing a pamphlet on the importance of planning and the group working on a tree marking guide.
3. Use the guide to assist landowners by holding forest forums.

LEAD ORGANIZATION: WV DOF

SUPPORT ORGANIZATIONS: USFS, WVU DFNR, DNR, TNC

TIMELINES: Completion by December 2011.

COST: To be developed by WV DOF.

MEASUREMENT OF SUCCESS: Guide published and readily available.

ISSUE 10-2: A very small percentage of timber harvested in West Virginia is from timberland professionally managed under a plan prepared by a trained professional.

Many, if not most, of the timberland owners with small tracts inherited them, acquired them incidentally with some other purchase or had a farm which just grew up in trees. As a consequence the owner has no real commitment to the trees as he has no investment in them. This means that sustainability and ecologic management do not play a role in the decisions that are made. Successful forest management depends on careful planning at all stages. Such planning forms are the basis for deciding feasible forest management objectives, strategies that will provide the best growth and better species mix, scheduling of activities to minimize environmental damage, and how to protect sensitive features of the site or tract, minimize damages and preserve the aesthetics, three items that are foremost in the public's mind.

GOAL: Develop a circular stating the basic guidelines of good forestry as bullet points with brief explanations ending with the need for a management plan. Include such items as where to harvest, when to harvest, timing of harvest, directional felling, BMPs, tree marking, need for buffers, wildlife habitat protection, protection of other forest values, decreasing chances for exotic species to invade, etc.

PROPOSED ACTIONS:

1. Prepare an example of a complete management plan and distribute to forest landowners in the state.
2. Provide landowners with a contact list of registered foresters in each county who are available to prepare management plans.
3. Prepare and conduct seminars – see Issue 10-5.

LEAD ORGANIZATION: WV DOF

SUPPORT ORGANIZATIONS: WVU DFNR, DNR, NRCS, WVFB, WVFA, USFS research

TIMELINES: To be developed by WV DOF.

COST: To be developed by WV DOF.

MEASUREMENT OF SUCCESS: Plan prepared and seminars scheduled.

ISSUE 10-3: Landowners need more information on the definition and applicability of various silvicultural systems available to them.

GOAL: Inform landowners about single-tree selection, group selection, regular and irregular shelterwood systems, crop tree management and how those systems are used to meet landowner objectives.

PROPOSED ACTIONS:

1. Write up concise, jargon-free descriptions of the selection, shelterwood and clearcut systems, how each apply in the ecologic regions of WV and the information necessary to insure proper selection i.e., understanding of ecology or silvics of the desired species, site potential including slope positioning, current stand structure and condition, current stand composition, other landowner or local considerations.
2. Prepare a concise circular about the presence of damaging agents, invasive plants and insects, who to contact about them.

LEAD ORGANIZATION: WV DOF

SUPPORT ORGANIZATIONS: WVU DFNR, DNR, NRCS, WVFB, WVFA, USFS research

TIMELINES: To be developed by WV DOF.

COST: To be developed by WV DOF

MEASUREMENT OF SUCCESS: Actions completed.

ISSUE 10-4: Current hardwood forestry tends to ignore the former wide expanses of white pine. Much of the original area is now occupied by hardwoods.

The extensive logging of white pine in the latter part of the 1800s was a romantic time in West Virginia forestry. Much of this was on the 300,000 or so acres of white pine in the Greenbrier Valley area and much of it went to a mill at Ronceverte. The romantic part comes from the river drivers imported from Canada and highlighted in the book "Riders of the Flood." Effort to rejuvenate some of the white pine area on land now occupied by the Monongahela National Forest brought public outcry from those who liked the low grade oak forests that now occupied the former white pine territory. Efforts to use it as a beginning species in strip mine reclamation activity suffered the same demise although insects and white pine blister rust were also mentioned as factors influencing the decision. White Pine offers very good winter cover for wildlife mammals and at least one young plantation in the state (Clover Run) has volumes exceeding 100,000 board feet per acre.

GOAL: Inform landowners of the opportunities to plant white pine in their forests and restore former stands to their former species composition.

PROPOSED ACTIONS:

1. To prepare a popularly written silvicultural guide for white pine and to use it in public meetings and in forest stewardship training sessions for foresters writing forest management plans.

LEAD ORGANIZATION: WV DOF

SUPPORT ORGANIZATIONS: WVU DFNR, DNR, NRCS, WVFB, WVFA, USFS research

TIMELINES: To be determined by WV DOF.

COST: To be determined by WV DOF.

MEASUREMENT OF SUCCESS: Action completed.

ISSUE 10-5: Harvesting without the benefits of a management plan and without pre-harvest planning for advance regeneration has resulted in forests that differ greatly in stocking, stand structure, growth rate, species composition and quality.

Forest management is a planned process of interdependent treatments designed to effect the orderly modification, improvement and utilization of the forest. It requires some stand disturbance, usually well regulated. Although logging is the harvesting of timber it is also the main tool by which stands are manipulated for improvement and higher value future crops. Past uncontrolled harvesting has resulted in inferior forests. Tree marking is more or less an art, but it is based on sound ecological, biological, economic and aesthetic science. It requires the combined skills of all of the disciplines available to resource management. Tree marking is the mechanism that facilitates the management system.

GOAL: To begin a program that will educate landowners and foresters alike as to the necessity for planning the harvest and marking the trees to be removed as they apply the principles of integrated forest management through professional tree-marking activities.

PROPOSED ACTIONS:

1. To prepare a guide on tree-marking procedures for use in planning, executing and evaluating the various silvicultural procedures used in the partial cutting forest management systems and for teaching landowner workshops.
2. To prepare a circular that will show how the accepted principles of good forest management as implemented with pre-harvest tree marking will create a healthy forest that will supply timber, provide wildlife habitat, woodland recreation, aesthetics, clean water and soil maintenance.

LEAD ORGANIZATION: WV DOF, WVU DFNR, USFS research

SUPPORT ORGANIZATIONS: DNR, WVFA, TNC, WVFB

TIMELINES: Begin in 2010, complete in 2011.

COST: To be determined by WV DOF.

MEASUREMENT OF SUCCESS: Publication of circulars ready for distribution and use in landowner seminars.

ISSUE 10-6: The different site productivity caused by the interacting effects of elevation, climate, bedrock types, available moisture, etc. (physiographic sites) in the three or five ecologic regions of West Virginia are seldom a consideration in professional tree marking activities.

GOAL: Produce tabular information that can be used to show the differences of growth for valuable species vs. site in each of the regions.

PROPOSED ACTIONS:

1. Analyze available data for tabular presentation.
2. Prepare checklists of data needed for tree-marking guidelines.

LEAD ORGANIZATIONS: WV DOF, WVU DFNR, USFS research, WVFA

SUPPORT ORGANIZATIONS: NRCS, WVFB, TNC, DNR

TIMELINES: Teach workshops in 2011.

COST: To be developed by WV DOF.

MEASUREMENT OF SUCCESS: Checklists available for distribution.

ISSUE 10-7: The development of cull in logging wounds and fire damaged trees is not well understood and is not used as a criterion in marking trees for harvest.

GOAL: Summarize information on cull volume and vertical decay over scar age and scar dimensions for the valuable WV hardwood tree species.

PROPOSED ACTIONS:

1. Review, edit and publish in popular format.
2. Hold field demonstrations to show accuracy of tabular data and how it can and should be used.

LEAD ORGANIZATIONS: WV DOF, WVFA

SUPPORT ORGANIZATIONS: WVU DFNR, TNC, WVFB, DNR, NRCF

TIMELINES: Schedule for initiation in early 2011

COST: To be determined by WV DOF.

MEASUREMENT OF SUCCESS: Publication completed and well publicized field demonstrations held.

ISSUE 10-8: There is little information available for foresters and landowners to use as guidelines when making cut-and-leave decisions in marking hardwood stands.

Sustainable wood production can occur only when the growing space is fully occupied on an acre or in the stand. Residual stand density and structure have a direct impact on future growth of volume and value in a hardwood stand. In addition, the attributes of individual trees can also affect future growth and value of forests. Tree marking is the technique used to implement silvicultural practices. It is one of the most complex activities in forestry and requires competence and experience in species identification, silvical characteristics, tree vigor, tree quality, defect signs, necessary stocking levels, stand structure, tree grades, wildlife habitat, appreciation for aesthetics, etc. Historically, the forests of WV have been “managed” in various ways, mostly for profit through the sale of stumpage. The management techniques have varied from professionally applied single tree and group selection to species or size high grading to clearcutting. These past disturbances, plus those caused by fire, wind, insects and the silvical characters of species have strongly influenced what is now available. Each stand may have different problems associated with species composition, stand structure, stocking, vigor quality, etc. In general, good forestry is good silvicultural manipulation that maintains ecological processes and wildlife habitats while growing vigorous, high quality trees.

GOAL: Compile and publish guidelines on tree attributes that will result in better quality residual stands and substantially higher future yields.

PROPOSED ACTIONS:

1. Develop an illustrated stand level marking guide based on ecologic, economic, biologic and aesthetic factors that will provide for the long term health of the forested ecosystem while supplying or preparing to supply a steady flow of raw materials to forest-based industries. Develop a fact sheet to illustrate the complexity of silvicultural tree-marking for harvest.
2. Compile available data on special wound size and expected decay volume and defect class by species or species group i.e., basal stem wound, broken tops, broken branches, fire scorch, darkface logging scars, whiteface logging scars, root damage or exposure, seams, fungal conks, etc. and how each affects current and potential quality.
3. Compile available data on live cavity trees (OSHA regulations prevent leaving dead snags while logging), down woody debris, shrubby under-stories, browse, herbage, etc. for wildlife.

LEAD ORGANIZATIONS: WV DOF, WVFA

SUPPORT ORGANIZATIONS: As needed.

TIMELINES: Complete by March 2011.

COST: To be absorbed.

Summary of State Forester's Report to FMRC on Forest Management and Wildlife

Professional forest management is the most important aspect in developing good wildlife habitat. The diversity provided across the forest by young stands, middle aged stands and old stands; deciduous trees and conifers; shrubbery of numerous species, hundreds of herbaceous plants etc., as found in a managed hardwood forest, is vastly different from strictly young stands, strictly old stands or even a pine plantation. Wildlife prospers best in diverse situations.

There always seems to be a question as to what is considered wildlife. Briefly, the term includes all non-domesticated animal life, including fish. The naming of the U. S. Fish and Wildlife Service was a strictly political decision. In any event, wildlife management is not restricted to game species although game animals are, for economic reasons, the main focus of most wildlife agency activities. The term "wildlife" was coined in 1913, but was rarely used and it didn't start to appear in regular dictionaries until the early 1960s.

Forest management manipulations are used to manage, directly and indirectly, all species — from herbaceous plants to trees, from songbirds to game birds, nongame to game animals, bacteria, algae, fungi, and so on, by varying the ecosystem. You don't restore wildlife habitat, you restore the forest and the type and status of forest comprises various wildlife habitats. We manage for diversity because all species have some value in the interconnected chain of ecosystem life even though we may not yet know the specific interactions or values. It's sometimes hard to convey the idea that a "forest stand" is not an "ecosystem." Stand, as commonly used, is the trees only, whereas ecosystem refers to all plants and animals and their environments. This is an important point because people are people and many value systems are involved in attempting to influence professional forest management. It's hard for the non-forester to understand that a forest ecosystem is not a random set of organisms or that one type of manipulation does not fit all species. Also, natural resource professionals who believe that they can drop social and economic influences to concentrate on biological or ecological study are naïve, misled or both. The documentation of economic values of all aspects of the forest has become increasingly important.

There are also untold numbers of people who in one way or another use the forests and influence forest management. This includes hunters, hikers, naturalists, campers, fishermen, backpackers, bird watchers, among others as well as the special interest organizations associated with each, plus, very importantly, the policy makers in government.

Some interests complain about the destruction of wildlife habitat under certain forestry practices while others assume certain forestry management techniques are good for wildlife although they do little to enhance the growth of timber. Neither is totally true. A technique may destroy habitat for a certain species, but in doing so it creates habitat for a different species. The essence of good forest management is that forest practices do not destroy ecosystems, they only alter them. The mix of species may change, but the ecosystem continues. The question is should any particular species be favored? The answer is no. Forest management insures the habitat for all species sometime during the rotation. It's all there on managed forestland tracts, but everything is not located on any particular acre. For example, a clearcut area will have few squirrels, but will have a lot of butterflies. Which is valued the most and by whom? How about skunks and raccoons or snakes and deer? Are animals created equal? Are game animals more equal than non-game animals? Are animals more valuable than plants? These are all questions that a forest manager pointing towards sustainability has to consider. They can no longer be

ignored as they often were under strictly timber management or strictly game management scenarios. An example I often use, although not from the continental United States is the value of rats. In the United States they are just vermin; in Nigeria they sell for more than beef or pork.

The animal rights movement is also becoming more and more prominent. Some in this interest group even believe that wildlife have legal standing. Other groups accept that land is the most fundamental and valued resource. The truth is that wildlife management has to be a package deal. Although most of the land in the U. S. is privately owned, the type of management applied greatly affects public values. The stewardship, however modified, affects wildlife, watersheds, flood plains, timber stands, wetlands, scenic vistas, etc. ,that are accepted as public benefits and often discussed as public rights.

It's important to remember that states own the wildlife although individuals and corporate America own most of the wildlife habitat; states sell the wildlife, at least the game part, through the licensing system. The land owners gain nothing. The various issues are strictly political. The main problem is that the wildlife services mostly view animal damage control as nothing but a political liability. Economic cost benefits are not made commonly available. Much the same is true for tourism which depends on timber and wildlife aesthetics.

There are continuing conflicts. It is ironic that restoration of deer in West Virginia, a success for game management, has led to one of the most challenging problems that forest managers now face. Deer are a valuable resource, but they have increasingly become a pest.

As policy makers, you recognize that deer over-abundance is not simply a deer biology or ecology problem. These are important issues, but the social, political, legal and economic aspects are overriding. The problem is becoming ever more so as societal values change as the population increases and developments expand into previously forested areas.

The ecological consequences of over-abundant deer populations are tremendous. The carrying capacity of West Virginia hardwood forests is, according to the literature, about 16 deer per square mile. The population in some areas now averages at least 60 per square mile. Deer hunters value the easy hunting this provides, but timber managers decry the extra 20 or so years added to each rotation, the changing of species composition and the resultant financial losses. Health officials point to the Lyme disease as a continuing problem, especially when deer drop infested ticks in urban areas. Plant ecologists discuss the extinction of plants such as the lady slipper and insurance and highway officials are chagrined at the millions of dollars in losses each year due to deer-vehicle collisions. Animal ecologists say an over-abundant deer population greatly affects other species of birds and mammals.

These and similar examples greatly complicate the job of professional forest managers striving for sustainable forestry. Timber losses to deer browsing is about \$357 million dollars per year in the State of Pennsylvania. In West Virginia the loss is probably closer to \$225 million as based on \$25 per acre annually. This is \$2,000 per acre over the usual 80 year rotation.

11. Forest Management and Wildlife

The Forest Management and Wildlife Group identified a total of 3 issues.

The mixed-oak forest is one of the major forest types of the mid-Atlantic region (19.4 million of the 22.4 million acres). Despite its widespread dominance, the mixed-oak forest is in decline and requires careful management to be sustained. Throughout this region oaks are being replaced by other hardwood species. Recent Forest Service data show that oak accounts for 29 percent of the total growing stock volume but also accounts for 43 percent of the removals. This data also points out, that for all stems larger than two inches DBH, red maple and black birch are the two most common species with northern red oak ranking ninth. The disparity is evident also in the sapling and pole size classes where red maple out numbers all oak by ratios of 6:1 and 3:1, respectively. So as mature oaks are harvested and/or die from other causes (Gypsy moth - oak decline), they are being replaced by other less desirable hardwood species (beech, birch, red maple, stripped maple). This shift in species composition in mixed-oak forest is highly undesirable to natural resource professionals (foresters and wildlife biologists) and society as a whole, because oaks have both economical and ecological value. For example, more than 50 vertebrate species regularly consume acorns, among them many important game animals such as deer, bear, squirrels, turkey, wood ducks and grouse. Acorns also make up a large portion of the diet of many nongame species such as red-headed woodpeckers, blue jays, white-footed mice and chipmunks (since the loss of American chestnuts, acorns are the primary source of hard mast). Many species of wildlife in oak forests depend on acorns to such an extent that they exhibit physiological differences with populations responding to fluctuations in acorn crops. For instance, acorn availability can affect the weight, condition, reproduction rates and antler characteristics of white-tailed deer. Similarly, rates of birth, survival, and dispersal in black bear vary with the abundance and distribution of acorn crops. Variation in mast production also influences population levels and distribution of a variety of small mammals and birds, including mice, squirrels, blue jays and woodpeckers.

Economically, oak species are of great importance to the state. Oak saw logs are used for a variety of products ranging from cabinets, fine furniture, flooring and whiskey barrels to dimension lumber, pallets and railroad ties. The wood products industry employs thousands of people, a significant proportion of which is related to the growth, harvest, manufacturing and delivery of products from oak. The reason oak forests are declining is the widespread use of harvest methods that result in "high grading" (taking the best and leaving the rest) without any regard or thought of how to regenerate the timber stand.

ISSUE 11-1: Mixed oak forests are declining at an alarming rate which is negatively impacting wildlife populations and long term forest sustainability. There is need to provide healthy forests with wildlife populations maintained at the ecological carrying capacity.

GOALS:

1. Reduce the amount of high grading in forest stands.
2. Promote and encourage forest age class diversity within private forest lands.
3. Promote even aged forest management as an alternative to high grading. This will insure that important mast producing tree species will be regenerated.
4. Promote timber sales with disturbance regime controls (prescribed fire, non native invasive species (NNIS), insect and disease and high deer populations).
5. Establish protocols and management schemes for coping with endangered species.
6. Regionalized regeneration techniques for forest managers as appropriate by forest cover types — and ecoregion.

PROPOSED ACTIONS:

1. Consolidate recent research and literature showing the negative impacts of high grading. Prepare and distribute fact sheets with literature references.
2. Provide additional education and training through stewardship training and landowner workshops.
3. Foresters and Wildlife Biologists jointly determine general forest age class distributions for healthy forests and associated wildlife populations.
4. Increase landowner awareness through fact sheets and workshops.
5. Establish multiple demonstration areas on public and private lands illustrating forest management with age class diversity and wildlife habitat emphasis. Monitor results.
6. Establish demonstration areas with preventative or remedial cultural practices. Monitor results.
7. Conduct training and provide fact sheets for landowners to use for conducting forest and wildlife management on their properties.
8. Prepare fact sheets and forest manager training and landowner workshops.

LEAD ORGANIZATION(S): WVDNR, WV DOF

SUPPORT ORGANIZATION(S): West Virginia Forestry Association, Society of American Foresters, Natural Resources Conservation Service, West Virginia University Division of Forestry, National Wild Turkey Federation, Ruffed-Grouse Society, West Virginia Bowhunter's Association, The Nature Conservancy, United States Forest Service, and West Virginia Wildlife Federation

TIMELINES: Monitoring during 2009-2015. Hold the first training and educational workshops during the fall of 2009, thereafter annually. Conduct integrated workshops for the general landowner during 2010, thereafter annually. Fact sheets to be available in 2010 (date not specific). Establish demonstration areas during 2009–2015. Provide demonstration areas—2009–2015.

COST: To be developed after planning completed.

MEASUREMENT OF SUCCESS: Increased awareness of applicability of various regeneration techniques among forester, wildlife biologists, and landowners. Success can also be measured by the number of people attending workshops.

ISSUE 11-2: There is no readily available concise source of information that explains the interrelationships of wildlife management and timber management activities.

Wildlife issues arise whenever a controversy develops over some aspect involving wildlife and agriculture, wildlife and timberland, wildlife and conservation, etc. A definition of wildlife is even challenging as are habitat, critical habitat, game and non game and forest fragmentation. Are some species too abundant? If so, what is the impact on other species? Are there monetary damages? How about damaging exotics and is there a difference between accidental and deliberate introduction? Arguments also arise about hunting rights, trespass, wildlife damages such as by bear, deer, raccoons, beaver, coyotes, etc. Is wildlife always considered in timber management planning? Is timber management always considered in wildlife planning? If not, why not.

Citizen participation is essential in settling wildlife issues. A good place to begin is with timberland planning. Perhaps with the preparation of easily understandable, but scientific fact sheets the current issues will not become big problems. Ecosystem management can assist both disciplines. However, timber harvesting and regeneration activities are not natural occurrences as are fire or tree kill by defoliating insects.

GOAL: To explain, in an easily readable and factual format, the major changes that timber harvesting and regeneration activities in different terrestrial habitats can have on late-successional and early-successional wildlife populations and the equally negative effects that a lack of timber harvesting or other large scale disturbances can have on wildlife, especially game animals.

PROPOSED ACTIONS:

1. To develop one to several information sheets that will examine the above goal from the basis of the different forest types and game and non-game animals.
2. To develop a list of critical questions that need to be answered in order to rectify the issue with suggestions on the research needed.
3. Develop a field course that will examine different sites to explain different impacts.

LEAD ORGANIZATION: WV DOF, WV DNR, WVU DFNR

SUPPORT ORGANIZATIONS: WVFA, NRCS, TNC, WVFB

TIMELINES: Organize individuals or teams to begin the activity in 2009 or early 2010. Have duties outlined by July 2010. Completed project by early 2012, except for ongoing research.

COST: To be developed after sheets are developed by WV DOF.

MEASUREMENT OF SUCCESS: Have materials ready for distribution and be conducting workshops.

ISSUE 11-3: There are no generally available guidelines to assist resource managers in maintaining or creating good habitat for wildlife.

It is apparent that there will be conflicts between timber harvesting and localized wildlife populations. However, the local manager or landowner should, after proper study, be able to effect compromises between government and industry personnel that will enhance both valuable resources.

GOAL: To use current scientific evidence and expert opinion to prepare forest management guidelines for the provision of wildlife habitat that can be part of the desired future forest condition.

PROPOSED ACTIONS:

1. Organize a small committee of both disciplines to come up with concise publications that will suggest forest management guidelines for the provision of habitat of major wildlife species, including the protection of fish habitat, that exist within the various eco-regions of West Virginia.

LEAD ORGANIZATION: WV DOF, WVDNR

SUPPORT ORGANIZATIONS: WVFA, WVU DFNR, NRCS, WVFB, USFS research

TIMELINES: As possible, but target date for completion should not be later than 2011.

COST: To be developed by WV DOF.

MEASUREMENT OF SUCCESS: Publications in hand for distribution.

Summary of State Forester's Report to FMRC on Usefulness of Wood Biomass from West Virginia Forests

Biomass is the total mass, usually given as green or dry weight, of living organisms at any given time per unit of space, usually acres. The term biomass has suddenly become a buzzword in the lexicon of government officials seeking to develop the use of alternative fuels in the United States. **Wood biomass** is the total wood in trees per acre and both words should be used in describing it. Wood fiber is largely cellulose; so alternative energy developers often use the term **cellulosic biofuel**, but this description covers both forest and agriculture materials that can be used.

Wood biomass deserves great attention in any discussion of sustainable forestry as large scale usage by bio-refineries producing alcohol and generating facilities producing electricity could result in significant losses of wildlife habitat and in indirect land use changes. Harvesting of woody material for biomass is by chipping portions of merchantable trees such as limbs and upper stem logs not utilized by timber harvesters or trees which for some reason are unmerchantable.

If large scale usage develops without strict forest management planning protocols, native biodiversity could be greatly compromised. Many of the trees growing in West Virginia, dogwood, service berry or sarvis, blue beech, ironwood, Mt. ash, black gum, etc. are unmerchantable for timber purposes, but are necessary for wildlife and ecologic purposes and probably should not be used for fuel. Buzzwords do draw attention and a national **Council for Sustainable Biomass Production (CSBP)** is up and running and has produced a draft voluntary standard for forestry and agriculture.

The biodiversity of the forest is greatly influenced by the litter, leaves, small twigs and sloughed bark that falls to the forest floor each year. This averages about 1.5 to 4 tons per acre per year in temperate forests. From one-third to one-half of the total above ground growth of trees ends up as litter each year. Some of this is coarse woody debris (CWD) which is stems larger than one inch although some land managers use three inches. Dead wood in the forest is vital in carbon budgets and is an invaluable wildlife resource in slowing sediment in streams, on the forest floor for the many beetles, termites, ants and a myriad of others that subsist on it, as nurse logs for algae, fungi, mosses, liverworts and lichens and for seedbeds for some trees, as hemlock yellow birch and red spruce, that often start on old logs and stumps. CWD is not as important for nutrient balance simply because wood is low in nutrient chemicals.

Some books on ecology have entire chapters on the need for forest managers to maximize the CWD in forests even though many humans, with limited ecological knowledge, instead want tidiness and order. Log and woody debris decomposition is hastened by fungal rots and burrowing invertebrates of many kinds. Each stage feeds on the previous stage until the CWD is incorporated into the humus. Importantly, this succession is vital to the biodiversity that ultimately results in harvestable trees. The loss of any stage, in time, undoubtedly does irreparable harm although nature has a way of rectifying man's mistakes.

It is the responsibility of professional foresters involved in forest management to apply their specialized training and experience in resolving societal problems in the common interest. This sometimes means that the prevention of environmental misuses involves social and political course changes. To a degree, this may be true in the utilization of biomass when forest sustainability for lumber production is the goal. Before acting on the several current proposals for wood biomass utilization, consideration must be given to the amount of material available, the cost of harvesting and transporting the material, the cost of utilizing the material and the net return on the product. Government subsidies

that currently amount to 50% or more of the start up production costs must be considered as negative factors in segregating exploitive and sustainable practices. Care must be taken to segregate resource viability and public policy. In general, people pursue different policies because of their own perspectives and special interests. When wealth and power are foremost, little effort is expended to gather social and ecological data. All too often, when natural resource problems arise, people jump to immediate solutions. A professional forester must be aware of what might happen in the future and suggest alternatives to avoid pitfalls.

A strategic plan is a set of rational strategies each of which sets goals (using reliable, verifiable knowledge), describes side effects, and weighs possible goals against each other. The knowledge of trends and the knowledge of conditions often fall prey to self-perception by those charged with making projections. In natural resource work, it is very easy to assume goals without actually developing the actual data. For example, how much wood biomass is now being utilized for home and industrial fuel wood, as a carbon source in steel making, and as a feed stock for wood pellet, charcoal and paper manufacture and how much can be utilized without ecologic harm? This committee is working towards the development of these answers.

12. Usefulness of Wood Biomass from West Virginia Forests

The Wood Biomass Study Group identified a total of 6 issues.

ISSUE 12-1: WV should develop a thorough review on the availability of material that would be considered biomass; where the material is located; industries that currently use biomass in the state; and opportunities associated with increased production of biomass in the state.

GOAL: Develop statewide reports detailing concentrations of woody biomass and the relationship to the existing industries that produce wood products and those that use woody biomass as well as potential areas in West Virginia where increased production of biomass could be achieved.

PROPOSED ACTIONS:

1. Identify current sources of material that can be considered biomass in West Virginia.
2. Develop detailed information on current surplus biomass availability based on inventories currently being conducted.
3. Develop resource inventories related to woody biomass from USDA FIA and TPO datasets for West Virginia and surrounding states.
4. Develop a system for assessing wood utilization on timber harvests in West Virginia so that under-utilized wood fiber can be inventoried yearly and these data could be used for attracting industry that can use this material as a feedstock.
5. Develop a comprehensive database containing all information related to woody biomass availability in West Virginia. This action includes the combination of existing sources of biomass availability as well as developing a means of estimating biomass produced from non-traditional sources such as utility clearing and urban wood waste.
6. Develop a web-based information system that is updated, on a continual basis that provides estimates of biomass availability across West Virginia. This system should be developed so that it is the first source of information on feedstock availability for industries looking to develop biomass-based business in West Virginia.
7. Initiate a study to determine the biomass production potential on reclaimed mine lands in West Virginia. This study should address the available acreages, production estimates, and management costs for developing biomass resources on mined sites.
8. Develop an analysis that prioritizes areas in the state as to their suitability for new biomass based business ventures. This analysis would take into account biomass availability, transportation networks, utility grids, water resources, existing wood industry supply areas and other important data sources to help spur development of wood-energy projects.

LEAD ORGANIZATION: WV DOF

SUPPORT ORGANIZATIONS: West Virginia University, USDA Forest Service, West Virginia Division of Energy, West Virginia Forest Industry

TIMELINES: To be developed by WV DOF.

COST: Biomass availability study and web-based application: \$100,000/year over three-year period.
Biomass on reclaimed mine lands: \$200,000 in year 1-2 and 50,000/year for remaining time frame.
Biomass priority project: \$50,000 first year, \$20,000/year to continue updates during project time frame.

MEASUREMENT OF SUCCESS: To be developed after timelines decided.

ISSUE: 12-2: Information is needed on the economic feasibility of increased wood removal from traditional timber harvests for biomass-related projects in West Virginia.

GOAL: To define the economic supply of biomass in West Virginia

PROPOSED ACTIONS:

1. Conduct a literature search to define the state of knowledge on logging systems and cost, processing costs, limitations (terrain, thinning and landings) and evaluation of recovering biomass after saw log harvest.
2. Study various logging systems used to recover biomass to determine the economic supply of biomass in West Virginia.
3. Prepare economic data on biomass, biomass being utilized and the surplus.

LEAD ORGANIZATION: West Virginia Division of Forestry

SUPPORT ORGANIZATION: West Virginia University, USDA Forest Service, West Virginia Division of Energy, West Virginia Forest Industry

TIMELINES: 2010–2011

COST: \$20,000 to conduct survey and analyze results.

MEASUREMENT FOR SUCCESS: Develop a report showing cost/ton for different methods of logging biomass.

ISSUE 12-3: Guidelines are needed for the primary forest industry to promote feasible and profitable business opportunities in utilizing biomass removals from West Virginia forests.

GOAL: To develop and promote biomass as an added business product for loggers and an additional income stream for landowners and to encourage land to remain in productive forest as opposed to changing to another land use.

PROPOSED ACTIONS:

1. Conduct a survey of the loggers in West Virginia to determine if they are willing to produce biomass and what their rate per ton would have to be to justify the purchase of whole tree chippers to maximize biomass production especially in areas where there is not a current market for fiber.
2. Conduct a survey of biomass-utilizing firms to determine characteristics of successful biomass suppliers.
3. Report the work force, machinery, and operations of successful biomass suppliers in West Virginia.

LEAD ORGANIZATION: WVU DFNR.

SUPPORT ORGANIZATION: WV DOF and WV DE.

TIMELINE: Have the survey completed within one year.

COST: \$20,000.

MEASUREMENT OF SUCCESS: Distribution of the report

ISSUE 12-4: It is not clear how biomass removal may impact erosion control, nutrient cycling, deer damage to regeneration, coarse woody debris organisms, and overall forest sustainability.

GOAL: To determine a safe threshold of biomass removal that promotes adequate forest regeneration and sustainability of critical ecological processes.

PROPOSED ACTIONS:

1. Develop guidelines for landowners to best utilize biomass (slash) for forest sustainability.
2. Produce a brochure for landowners to explain the positive and negative impacts of removing biomass.

LEAD ORGANIZATION: USDA FS, WVU DFNR.

SUPPORT ORGANIZATION: WV DOF.

TIMELINE: Develop guideline within the next 2–3 years.

COST: To be determined by WV DOF.

MEASUREMENT OF SUCCESS: To be determined.

ISSUE 12-5: Traditional economic development agencies in West Virginia have not promoted utilization of woody biomass. The WV Department of Energy has been a lone champion, but more effort is needed from local county development groups, West Virginia Development Office, and the WV Legislature to help promote the use of wood in non-traditional and emerging markets. The DOF should be consulted before firms are approved in an area.

GOAL: To promote the development of woody-biomass projects in West Virginia.

PROPOSED ACTIONS:

1. Propose incentives that would encourage companies to utilize biomass technologies in existing operations within the state of West Virginia.
2. Propose incentives that would encourage companies to construct new biomass facilities within the state of West Virginia.
3. Organize a public campaign to educate and inform the public, local government and businesses within the state of the benefits of biomass utilization.
4. Conduct a survey and study of existing companies within the state to determine what incentive programs would be most effective in persuading them to use biomass in their facilities.
5. Conduct a survey and study of corporations in other east coast states who already use biomass to see what incentives if any are being offered for them to operate in their respective areas.
6. Contract with a social marketing consultant to determine what messages will be most effective at reaching the industry, public and local government and encouraging the use and acceptance of biomass utilization.
7. Develop a statewide campaign incorporating the findings of the previous actions to promote use and development of new facilities to utilize our renewable biomass resources.

LEAD ORGANIZATION: WV Development Office.

SUPPORT ORGANIZATION: WV DOF, USDA FS, WVU DFNR.

TIMELINES:

2009-2010 Survey of existing companies within the state and corporations in other states.

2010-2011 Compilation of survey data and study of data to determine possible efficient incentive plans.

2011-2012 Contract with Social Marketing Firm to create messages for ad campaign.

2012-2015 Advertising campaign

COST: Surveys \$50,000; Compilation Study \$70,000; Social Marketing Firm \$120,000; Ad Campaign \$200,000 (\$50,000 per each year)

MEASUREMENT OF SUCCESS: Resurvey of corporations previously surveyed to see if they established or modified operations to utilize biomass and for what reasons. Compare amount of biomass harvested and utilized at the beginning of the ad campaign versus amount used by the end to determine possible impact.

ISSUES 12-6: It is not clear how the use of woody biomass could be used to generate electricity and serve as a means of reducing carbon emissions of fossil fuel plants.

GOAL: Determine opportunities and costs/benefits of wood fired electric generation in West Virginia and review environmental benefits of wood and wood co-firing with coal in electric generation applications.

PROPOSED ACTIONS:

1. Assess status of wood fired electric plants in US and Europe; quantify required inputs and anticipated environmental impacts/benefits of wood fired electricity and wood co-fired electricity; review state renewable portfolios to determine level of state's interest; and, contrast cost of wood fired electricity with electricity generated by wind, advanced coal, hydro, solar and natural gas (coal bed methane).
2. The Division of Energy will continue its work with the Appalachian Hardwoods Center in advancing wood energy projects.

LEAD ORGANIZATION: WV DOF, WV DE.

SUPPORT ORGANIZATION: WVU Appalachian Hardwood Center, WV DEP

TIMELINES: Associated activities are on-going.

COST: \$50,000 - The suggested approach to addressing the "strategy" activities is to contract with the Appalachian Hardwoods Center at WVU.

MEASUREMENT OF SUCCESS: Interest by private sector in locating a wood fired power plant in West Virginia.

Strategic Plan Study Groups

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Appendix A. FMRC Letter to Task Force.



WALT HELMICK
CHAIRMAN

THE SENATE OF WEST VIRGINIA
COMMITTEE ON FINANCE
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October 12, 2008

Mr. Randy Dye
State Forester
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Dear Randy:

It is again time to plan for the year's activities. Although we hate to train our sights on you, you and your crew can do what we need to have done. As you probably know better than us, the forestry industry has been having hard times. As always in politics, some in industry would like to blame the Legislature; some would place the blame on you and others will be after the Governor. We don't need the blame and we are trying to help the industry.

As a bit of history, the more or less informal Forest Management Review Commission (FMRC) was established as a statutory body in 1987 to serve as a coordinating body to generally assist in the retention and expansion of forestry and forestry related industries (5-23-4). The charge was to involve the several state and federal agencies, commissions, boards, committees, associations and other entities. Then Delegate Joe Martin, who, with Delegate Sara Lee Neal, helped initiate the legislation reminds me of this every now and then.

One of the first attempts of the FMRC was an effort to study and prepare a strategic plan for forestry in the State of West Virginia. Under the leadership of Delegate Neal and Senator Vernon C. Whitacre, then co-chairman of the FMRC, a statewide committee of some 75 knowledgeable individuals was organized under the leadership of four co-chairmen from the forest industry and economic development. This resulted in December, 1988 in a 139 page "Strategic Plan For More Fully Developing The Forest Resource In West Virginia." Your office probably has a copy of this document. The executive summary says the committee studied 17 issues, 49 goals, 54 strategies and that 269 specific suggestions were agreed upon. This was a remarkable accomplishment for a new Commission.

Mr. Randy Dye
October 12, 2008
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In the 20 years since, the industry has seen great progress as well as some disappointments. West Virginia has attracted some of the world's largest plants for manufacturing forest products from low quality timber which enables us to practice better forestry, according to reports from the U.S. Forest Service the state's timber volume continues to grow in excess of harvest, we continue to refine the various tax programs and the industry seems dedicated to sustainability. However, the current price for lumber is the lowest it has been in years, the high cost of fuel is said to be reflecting adversely on forestry activities and there is continuing litigation about whether forestry practices contribute to flooding.

Consequently, as co-chairmen of the FMRC, we have decided that another review is in order. We understand that it has been 100 years since the first efforts to develop what is now the Division of Forestry. Perhaps this overall effort could be tied somehow to this milestone. . .showing what has happened and why.

We would like for you to invite whomever is necessary to assist in studying the following topics with a view to reporting on one or two at each meeting of the FMRC this coming year. We understand that it takes a while to get organized; so we would expect your first oral report, with a condensed hand out sheet at the November meeting. At the conclusion of the assessment studies, we will work together to take the accumulated reports and from them devise a Strategic Plan for Sustainability of West Virginia Forests that the FMRC can publish as is did 20 years ago.

After quite a bit of thought, outside input, and we believe common sense, the following topics are being suggested:

- A. October. Just a report on how you are planning the studies.
- B. November. The West Virginia timber inventory.
- C. December. Taxation and West Virginia forestland. Are we different?
- D. January. West Virginia's primary forestry industry.
- E. February. West Virginia's secondary forest industry.

Mr. Randy Dye
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- F. March. West Virginia forest ecology - diversity, uniqueness, similarities, or as the scientists say the physiologic, climatology, edaphic and biotic. [Special meeting since the Legislature is in session.]
- G. April. Dangerous factors affecting forestry - past, present, future. [Special meeting since the Legislature is in session.]
- H. May. Reclamation of damaged lands to forestry.
- I. June. Urban forestry. Forest management and tourism.
- J. July. Regenerating the West Virginia forest. Usefulness of biomass.
- K. August. Silvicultural guides to managing West Virginia forests.
- L. September. Forest management and wildlife.
- M. October. Tree marking guides for West Virginia hardwoods.
- N. Strategic Plan for the Sustainability of West Virginia forests.

We realize that this will make your life very busy this year, but we believe that it is a necessary step in planning for West Virginia's future and the future of our very important forest resource.

Sincerely,



Walt Helmick
Co-Chair FMRC



Gerald L. Crosier
Co-Chair FMRC

Appendix B. FMRC Commendation to Forestry.

WEST VIRGINIA LEGISLATURE
Forest Management Review Commission

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Senator Walt Helmsick
Cochair

Delegate Gerald Crosier
Cochair

Resolution

By The West Virginia Forest Management Review Commission

“A Commendation for Professional Forestry In West Virginia”

Recognizing the State’s forestry and forest products industries and commending them for
the enthusiasm for which they have adopted and adapted to Sustainable Forestry.

WHEREAS, Forestry is the profession embracing the science, art, and practice of creating,
managing, using, and conserving forests and associated resources for human benefits and
in a sustainable manner to meet desired goals, needs, and values; and

WHEREAS, The specific goals and values achieved through forestry may include clean water,
clean air, wildlife habitat, timber production, woodland recreation and an array of non-
timber products, recognizing that all goals are not expected on all acres. Sustainable
Forestry specifically integrates managing forest lands for these values and goals at a rate
that will continuously maintain the potential for social, environmental and economic
benefits for present and future generations; and

WHEREAS, West Virginia is justifiably proud of its rich bounty of timber and associated plants
and animals and of its people who recognize that careful stewardship of our forest land is

essential if our descendants are to benefit from and enjoy these resources as we do today; and

WHEREAS, West Virginia's forests contribute more than four billion dollars annually from forest products and incalculable other dollars from clean water, hunting and fishing, aesthetics, and woodland recreation, and other environmental services that would not exist if it were not for the forests; and

WHEREAS, Through self-imposed voluntary forest practice standards that provided the foundation for West Virginia's Logging Sediment Control Act and Best Management Practices the state's forest products industry has achieved an outstanding record of responsible forestry. Moreover, industry members have implemented the national Sustainable Forestry Initiative, a program of member mandated comprehensive forestry and conservation practices, designed to perpetuate healthy forests and the thousands of life-enriching products derived from such forests through training, education, and monitoring; and

WHEREAS, Self-monitoring by the forestry industry and actively enforced state laws combine to ensure that West Virginia wood products are harvested and produced legally; and

WHEREAS, Based on credible testimony and evidence it is clear that the management of West Virginia's forests and the production of forest products in the state is fully sustainable, providing for current needs while ensuring the same or greater productivity for future generations; therefore, be it

Resolved by the Forest Management Review Commission on August 25, 2008:

That West Virginia forest landowners, particularly tree farm owners whose tracts have been recently recognized, nationally and internationally, as examples of sustainable forestry for

certification purposes are hereby commended; and, be it

Further Resolved, That the forest products industry is recognized for adopting the Sustainable Forestry Initiative through which it voluntarily promotes, trains, and educates company personnel, staff and contractors in the up-to-date use of professional forest practices designed to perpetuate and enhance our rich forest heritage; and for voluntarily subjecting its practices to monitoring to ensure compliance; and, be it

Further Resolved, That the West Virginia forestry community in general be commended for practicing careful stewardship that has increased the volume of timber growing in West Virginia's forests, while allowing some areas to be harvested five or six times, for each of the last six decades, as audited by the Inventory Branch of the U. S. Forest Service; and, be it

Further Resolved, That purchasers of West Virginia wood products can be assured, based upon ample evidence, that the forests of West Virginia are being managed sustainably, and harvested legally; and, not only are the forests themselves being sustained, but so are the myriad benefits essential to a healthy and productive life which will continue to be available for future generations. . .the products, the beauty, the wildlife, the recreation and the industry; and, be it

Further Resolved, That House Resolution No. 8 by Delegates Stemple, Butcher, and Williams passed during the 2001 Regular Session of the West Virginia Legislature, be incorporated by reference as part of this Resolution because of the meaningful and specific ideas expressed therein, especially the request that the public, forest landowners and resource agencies embrace and support the objectives of the Sustainable Forestry Initiative in this State.

Appendix C. Organizations Consulted or Mentioned.

West Virginia Division of Forestry (WV DOF)
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West Virginia Farm Bureau (WVFB)
Natural Resource Conservation Service (NRCS)
West Virginia University Division of Forestry and Natural Resources (WVU DFNR)
West Virginia Forestry Association (WVFA)
West Virginia Tax Department (WVTD)
West Virginia Department of Agriculture (WVDOA)
West Virginia Department of Tax and Revenue (WVDT&R)
West Virginia Conservation Agency (WVCA)
USDA Forest Service Research (WVFSR)
West Virginia Development Office (WVDO)
West Virginia Department of Transportation (WV DOT)
West Virginia Department of Education (WVDOE)
The Nature Conservancy (TNC)
Department of Commerce (DOC)
USDA FS State and Private Forestry (USFS S&PF)
West Virginia Chamber of Commerce (WV COC)
Business and Industry Council (BIC)
West Virginia Manufacturers Association (WVMA)
West Virginia Division of Natural Resources (WVDNR)
Forest Management Review Commission (FMRC)
West Virginia State Police (WVSP) (WVSA)
USDA Aphis Plant Pest Quarantine (USDA PPQ) (WVOCS)
West Virginia Oil and Natural Gas Association (WVONGA)
West Virginia Conservation Agency (WVCA)
West Virginia Land and Mineral Owners Association (WVL&MOA)
West Virginia DEP Office of Surface Mining (WVOSM)
West Virginia Association of Counties (WVAOC)
West Virginia Urban Forestry Council (WVUFC)
West Virginia Stream Partners Program (WVSPP)
Chesapeake Bay Initiative (CBI)
Potomac Valley Project (PVP)
West Virginia Appalachian Hardwood Center (WVAHC)

Appendix D. Glossary of Helpful Terms.

Biodiversity – a general term used to describe the complexity of ecosystems, species richness and genetic variation.

Board Foot – term used in estimating the volume of sawtimber in standing trees, usually expressed in thousands of board feet (Mbf). Each board foot is one inch thick, one foot wide and one foot long.

Ecosystem – the physical environment (soil, water, air, nutrients) and all associated living organisms (plants, animals, microorganisms). The ecosystem can be aquatic or terrestrial or intermixed.

Forester – a professional holding a college or university degree in forestry. Those involved in forest land management have the degree in forest management. In West Virginia foresters are accredited by the Board of Registration for Foresters and individuals must be registered before holding themselves out as foresters doing forestry work within the state.

Forestry – the science, business and art of creating, maintaining, managing forested landscapes and associated component parts in a sustainable way for the good of humans, the environment and the economy. Specific goals may include timber production, woodland recreation, clean air, clean water, wildlife habitat and assorted non-timber products, i.e. ginseng production, with the recognition that all goals are not expected from all acres.

Forest floor – the organic material lying on top of the mineral soil.

Forest harvesting – the removal of trees from forest land as specified in a forest stewardship and/or logging plan with such removal being conducted in compliance with applicable state and federal laws and regulations.

Forest land – real estate covered by trees and other woody and herbaceous plants capable of producing timber or other wood products. A general rule of thumb is that the forest shall have at least 100 trees per acre with at least 50 percent having a three inch or greater diameter at 4.5 feet above the surface of the ground on the uphill side of the tree. Acres that have been harvested, but with evidence of such stocking as shown by stumps are included.

Forest management – the application of scientific, economic, philosophical and social principles to the administration, utilization and conservation of all aspects of forested land to meet specific goals and objectives in a way that maintains continuous productivity.

Forest practices – any and all activities planned and conducted to achieve goals such as thinning, pruning, grapevine control, timber stand improvement cuttings, harvesting, fertilizing, pesticide usage, herbicide usage, fire control and prescribed burning, among others.

Litter – surface of the forest floor, composed of relatively under composed organic material such as leaves, twigs, bark.

Mast – the fruit of trees and shrubs that serve as a food for wildlife. There is both hard (nuts) and soft (berries) mast.

Physiographic unit or province – a land type subdivision based on soils, topography and climate.

Silviculture – The science and art of managing the establishment, growth, composition, health and quality of forests to keep them productive, healthy and continuous.

Slash – tree tops and branches left on the ground after logging or other disturbances.

Stand – community of trees uniform in composition, structure, age or other condition which are distinguishable from other adjacent communities.

Sustainability – management of a resource to meet current society needs without compromising the needs of future generations.

Sustainable forestry – the use of forest lands in a way and at a rate that will continuously maintain the potential for social, environmental and economic aspects of the forest.

Topography – the form or configuration of the earth's surfaces, hills, mountains, valleys, etc.

Appendix E. Guide to Preparing a Sustainable Forestry Management Plan.

What is a Sustainable Forest Management Plan?: A management plan, on paper, prepared by a professional with a degree in forest management, that will promote and improve the conservation and sustainable use of the forest resource to meet owner, local and national needs through protecting, managing and restoring the resource for the benefit of present and future generations.

Plan Duration: Historically, plans have been for 10 or 15 years. However, with just a bit more effort, the plan can (and should be) be for 50 years. Time tested silvicultural approaches have been shown to remain valid over time. For example, a recent (2009) study on more than 400 plots established 70 years ago on the Bartlett Experimental Forest using several different elevation classes, showed no evidence of environmental impacts. The dominant element was natural succession. It is important that a plan be simplified as much as possible, that is with as little as possible technical jargon, but this must not be to the extent of being unfaithful to the facts.

Inventory: The inventory is the heart of any sustainable forest management plan. It allows the species mix to be emphasized and it enables the forester to begin determining harvest rates. The implementation of a sustainable forest management plan is based primarily on a concise forest inventory, overlaid by knowledge about the tract, growth in general and forest ecology. The inventory is to give an overall picture of the forest including the number of stems, the diameter of stems, the basal area and the percentages of commercial and associated species. This must be detailed enough to provide a reliable estimate of the currently merchantable timber with a $\pm 10\%$ (no more than 20%) probability. Dead trees should also be recorded and notes should be recorded as to the need for thinning, grapevine removal etc. and any potential management problems or opportunities. On properties over 100 acres, an effort should be made to establish permanent growth/sample plots. When possible, these should be recorded permanently marked with GPS instrumentation.

General Items to Be Included:

Ownership details should include citing deed book and page numbers and tax map and parcel numbers. The location should be written out as well as placed on a portion of the appropriate topographic quadrangle. In preparing the location it should be located as to the county, magisterial district, drainage, and topographic quadrangle.

The **description** should include an outline on a topographic quadrangle, enlarged if necessary to show all details including adjoining properties.

The description shall show forest history, forest types, plants and animals, pests and weeds and any ascribed natural and/or amenity values.

The forest history should include information on timber harvests including a sketch of any haul or skid roads. The type of harvest and the condition of the residual stand should be noted. Logged areas shall be outlined on the forest type map. The fire history if any, should be explained.

Forest types shall be outlined on a map and based on the species distribution data collected during the inventory.

The plants and animals (flora and fauna) are to be described, if at all possible, by forest type. This catalog will provide a point-in-time benchmark against which sustainable management can be evaluated as to changes and improvements in species distribution and density.

Natural and amenity values are subjective, but an effort needs to be made to point out scenic landscape values, especially if visited or discussed by the public, and how a timber harvest will detract or add to or have no effect on such values. A paragraph should point out how the amenity values will be protected on this and adjacent properties.

List any introduced pests or weeds and any proposed control measures for those that threaten forest regeneration or forest wildlife.

Management:

The plan should mention the contemplated management, how prescriptions will be initiated and a system of monitoring and record keeping.

An initial step should be to map the forest into management units (compartments) and to prepare proposed harvest prescriptions.

The prescriptions will detail the long term goals for the unit. This should include how the trees are to be marked for harvest, how they are to be selected (vigor, overall health, size, individually or in groups), when the harvest will be conducted in regard to advance regeneration and how they are to be felled (directional ? or other). It should also include how the site and amenity values will be protected. To avoid the mistakes of past societies, soil degradation must be limited as much as possible. Monitoring (how and when) to assure that only marked trees are felled must be included with a follow up inspection to assess the condition of the residual stand and to record observed mortality. The following table, adapted from a USFS report may be helpful.

Record keeping is very important. There should be a record of each stand showing the location of all harvests or timber stand improvement activities, the volumes harvested and when harvested – by species and sizes, and the name and address of the logging contractor and the purchasing mill.

Adapted from:

Marquis, David A.; Ernst, Richard L.; Stout, Susan L. 1992. Prescribing silvicultural treatments in hardwood stands of the Alleghenies. (Revised). Gen. Tech. Rep. NE-96. Broomall, PA: U. S. Department of Agriculture, Forest Service, Northeastern Forest Experimental Station. 101 p.

For each forest stand in planned harvest, provide the following information. If the criterion does not apply, or is not available, explain why.

Existing Conditions	Poles (5.5-11.5" dbh)	Small sawtimber (11.5-17.5" dbh)	Medium sawtimber (17.5-23.5" dbh)	Large sawtimber (23.5"+ dbh)	Total for Stand
Dominant species					
Basal area (sq ft per ac)					
Percentage of stems/acre of acceptable growing stock (AGS)					
Number of snags/acre					
Average stand diameter	--	--	--	--	
Sapling regen/acre (stems 1.0-5.5" dbh)	--	--	--	--	
Marking guide					
Other pertinent info					

Anticipated Conditions after Cutting	Poles (5.5-11.5" dbh)	Small sawtimber (11.5-17.5" dbh)	Medium sawtimber (17.5-23.5" dbh)	Large sawtimber (23.5"+ dbh)	Total for Stand
Dominant species					
Basal area (sq ft per ac)					
Percentage of stems/acre of acceptable growing stock (AGS)					
Number of snags per acre					
Average stand diameter	--	--	--	--	

Forest Harvest Map

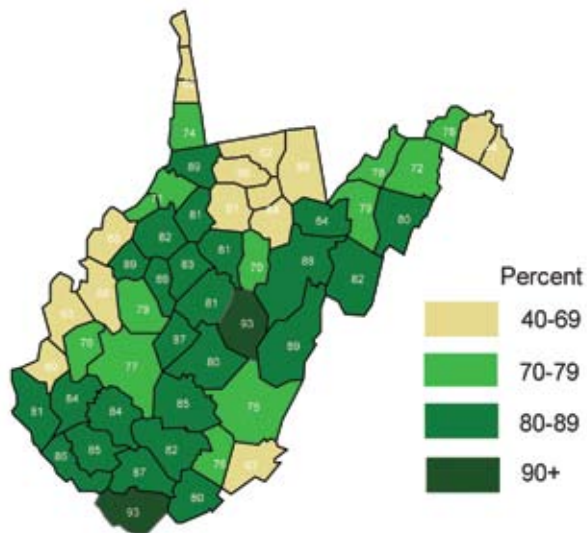
Include a map of the site including the following:

- Scale, north arrow, title
- Plot locations
- Stand boundaries
- Interior forest area
- Steep slopes
- Streams
- Wetlands
- No-cut buffers
- Planned skid trails
- Landing areas

**Appendix F. Maps Showing Current Forest Land.
Tables Showing Steepness by Counties.**



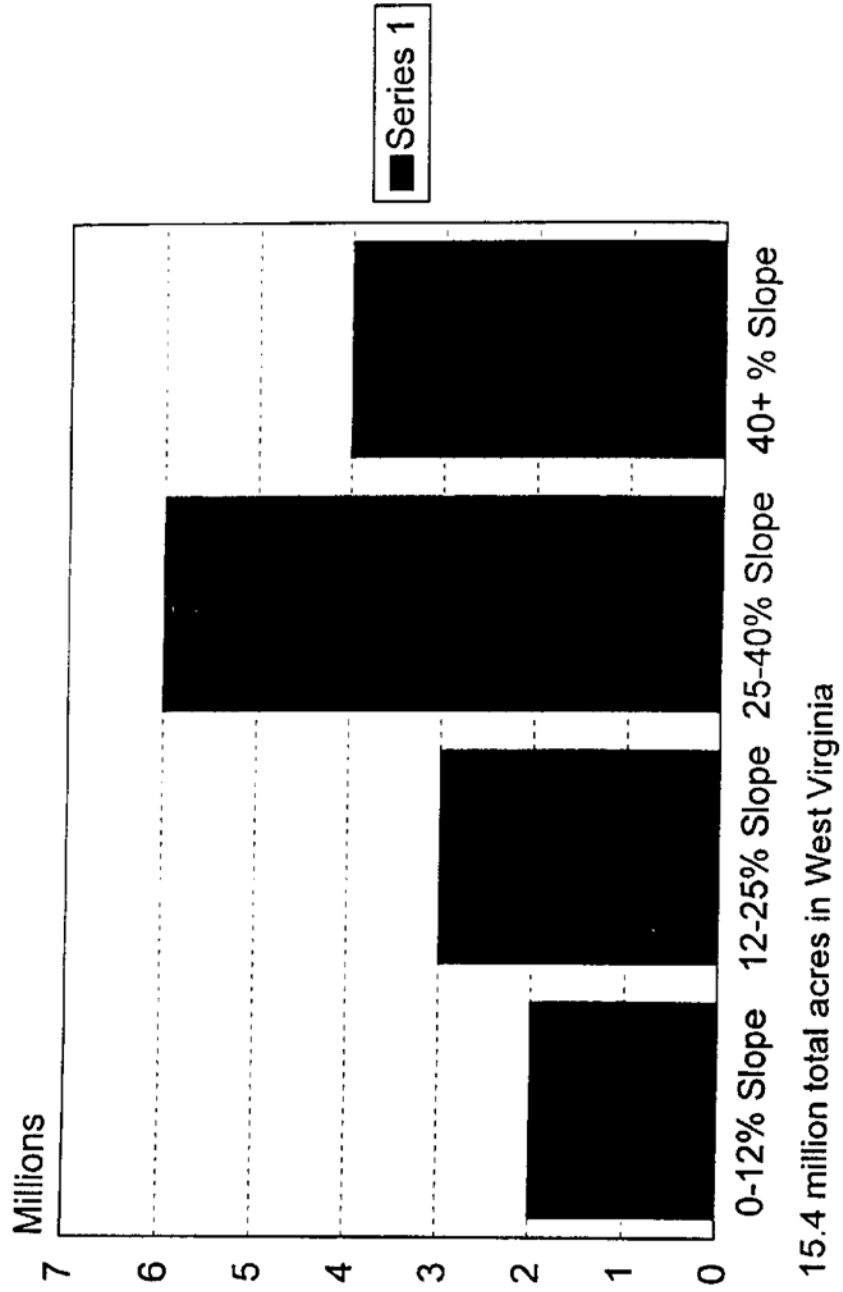
Distribution of forest land in West Virginia based on the Multi-Resolution Land Characteristics project, 1992. The MRLC uses data from the Landsat satellite to map land across the nation.



Percentage of land in forest by county, West Virginia, 2000.

WEST VIRGINIA TERRAIN

Slope Percentages (Acres)



DISTRIBUTION OF SLOPE CLASSES IN WEST VIRGINIA COUNTIES

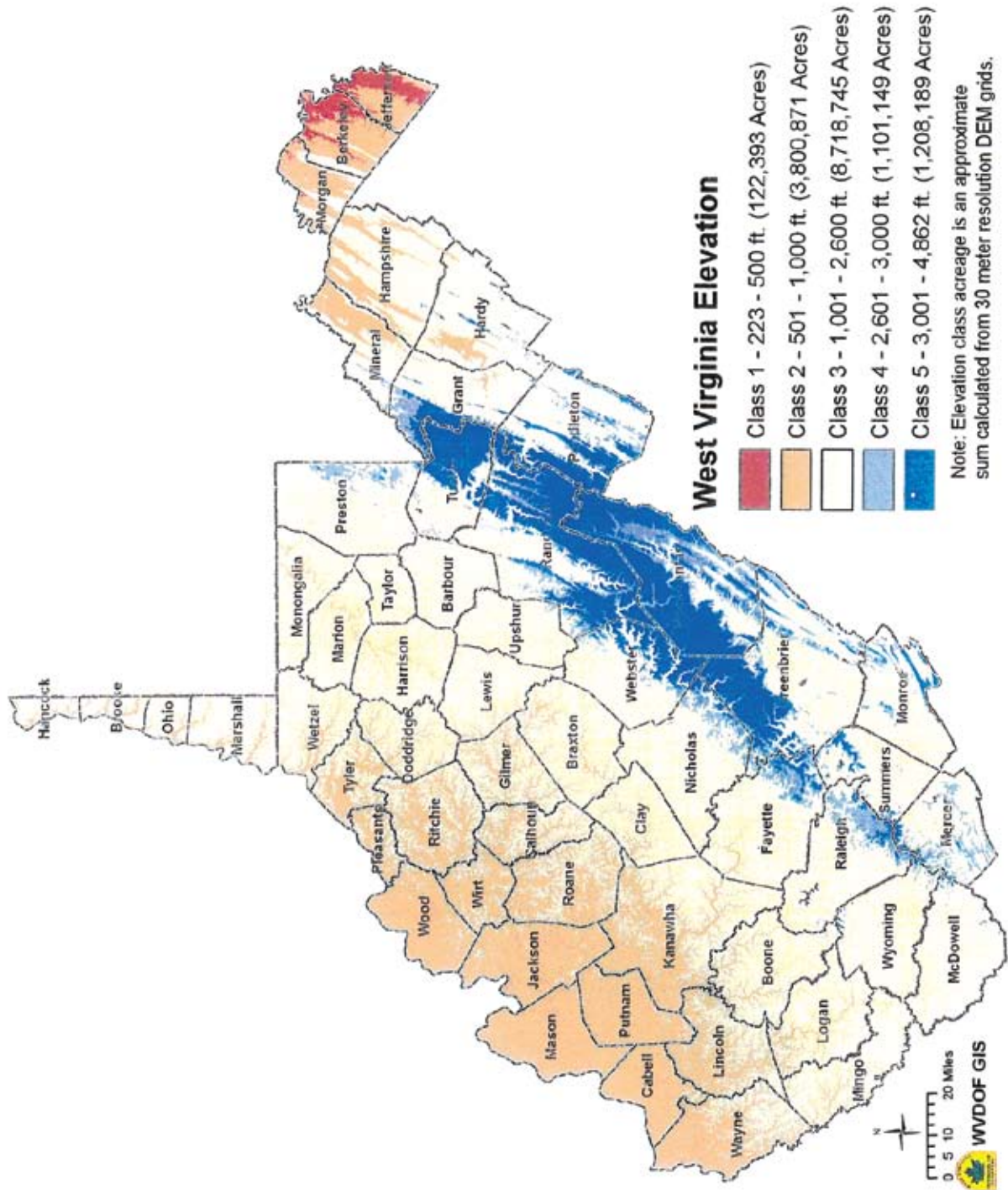
Prevailing Slope Class

County	Total Acres	0-12%				12-25%				25-40%				40+%	
		Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
Barbour	221,062	48,888	22.1	81,791	37.0	53,482	24.2	36,901	16.7						
Berkeley	207,859	118,317	56.9	60,810	29.3	16,935	8.1	11,797	5.7						
Boone	328,840	30,579	9.4	205	0.1	32,851	10.2	260,205	80.3						
Braxton	332,608	35,647	10.7	26,432	8.0	147,195	44.2	123,334	37.1						
Brooke	59,200	14,747	24.9	9,649	16.3	30,601	51.7	4,203	7.1						
Cabell	182,835	23,972	13.1	10,171	5.6	81,685	44.6	67,007	37.7						
Calhoun	179,328	5,799	3.2	3,469	2.0	67,783	37.8	102,277	57.0						
Clay	221,830	20,919	9.4	3,503	1.6	95,094	42.9	102,314	46.1						
Doddridge	205,830	12,070	5.9	6,936	3.3	177,044	86.0	9,780	4.8						
Fayette	426,560	59,891	14.0	100,485	23.6	122,873	28.8	143,311	33.6						
Gilmer	219,136	10,553	1.5	3,288	1.5	108,596	49.6	96,719	44.1						
Grant	305,920	93,114	30.4	90,455	29.6	72,623	23.7	49,728	16.1						
Greenbrier	654,592	167,943	25.7	137,400	20.9	179,559	27.5	169,690	25.9						
Hampshire	410,522	122,842	29.9	170,844	41.6	86,109	21.0	30,727	7.5						
Hancock	56,672	6,959	12.3	34,792	61.4	11,215	19.8	3,706	6.5						
Hardy	368,333	80,868	22.0	127,698	34.6	89,302	24.3	70,465	19.1						
Harrison	267,424	35,809	13.4	47,785	18.6	178,300	65.9	5,530	2.1						
Jackson	302,067	37,851	12.5	30,422	10.1	167,060	55.6	65,834	21.8						
Jefferson	135,942	115,453	84.9	12,116	8.9	2,593	1.9	5,780	4.3						
Kanawha	584,563	75,436	12.9	20,757	3.6	261,369	44.7	227,001	38.8						
Lewis	250,464	22,680	9.1	27,977	11.1	146,388	58.5	53,419	21.3						
Lincoln	279,878	21,566	7.7	7,844	2.8	177,553	63.4	72,915	26.1						
Logan	291,725	24,318	8.3	5,777	2.0	37,362	12.8	224,268	76.9						
Marion	200,672	18,448	9.2	30,578	15.2	131,594	65.6	20,052	10.0						
Marshall	201,766	16,970	8.4	51,829	25.7	75,988	37.3	56,979	28.2						
Mason	285,280	64,495	22.6	92,981	32.6	85,487	30.0	42,317	14.8						
McDowell	344,576	7,075	2.1	-	-	17,075	4.9	320,426	93.0						
Mercer	271,303	34,170	12.6	95,436	35.2	122,959	45.3	18,737	6.9						

Prevailing Slope Class

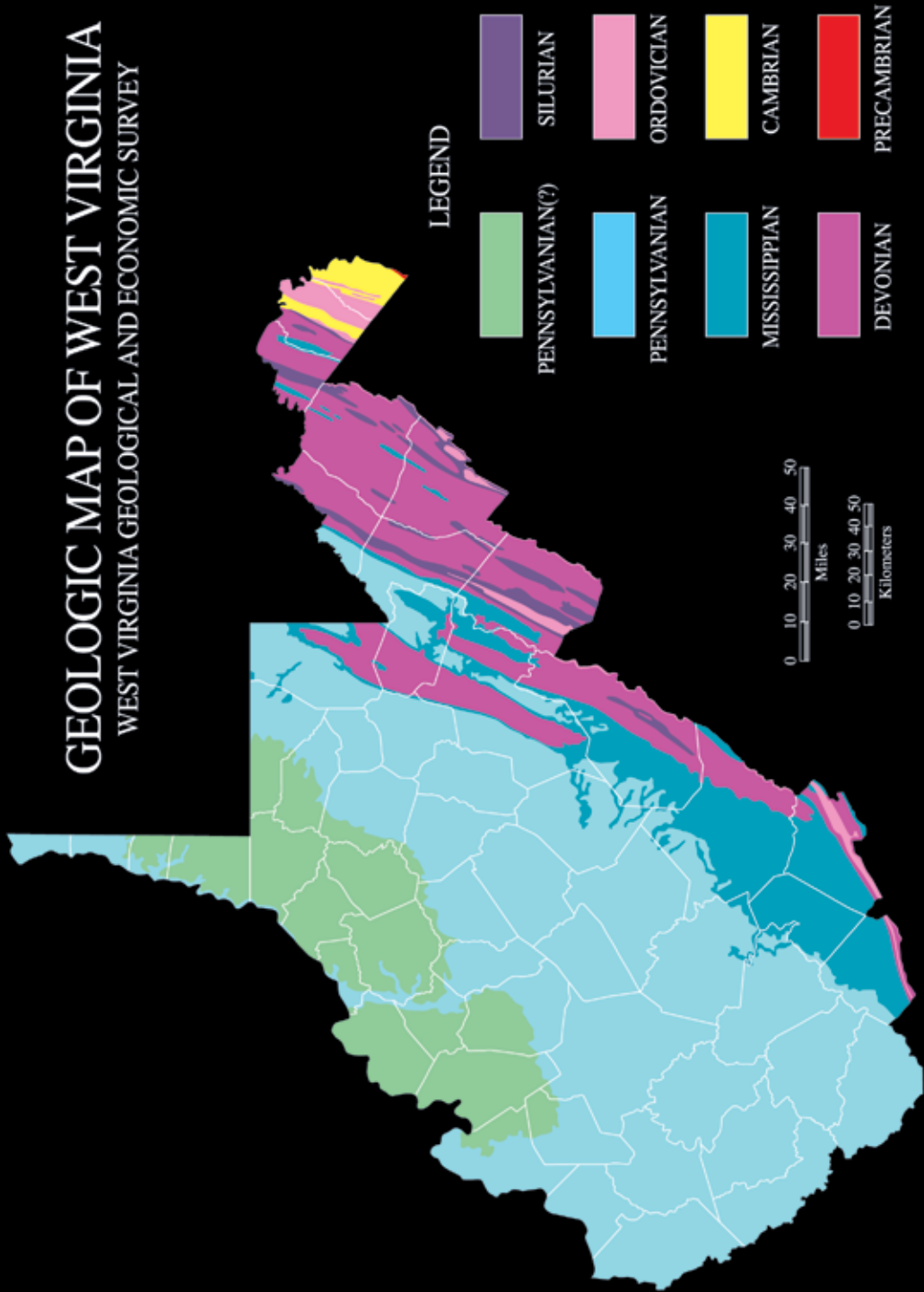
County	Total Acres	0-12%		12-25%		25-40%		40+%	
		Acres	%	Acres	%	Acres	%	Acres	%
Mineral	211,200	54,175	25.7	87,357	41.3	38,905	18.4	30,763	14.6
Mingo	271,040	22,386	8.3	5,777	2.0	37,362	12.8	224,268	76.9
Monongalia	236,045	21,818	9.2	56,162	23.8	120,099	50.9	37,966	16.1
Monroe	303,232	78,970	26.0	76,137	25.2	82,835	27.3	65,290	21.5
Morgan	148,006	32,110	21.7	58,158	39.3	26,460	17.9	31,278	21.1
Nicholas	420,333	102,929	24.5	105,203	25.0	116,010	27.6	96,191	22.9
Ohio	67,760	4,603	6.6	29,900	42.9	24,358	34.9	10,899	15.6
Pendleton	446,003	43,993	9.9	92,506	20.7	179,279	40.2	130,225	29.2
Pleasants	86,176	9,975	11.6	16,113	18.7	39,968	46.4	20,120	25.3
Pocahontas	603,270	80,961	13.4	123,664	20.5	228,939	38.0	169,706	28.1
Preston	418,483	82,100	19.6	188,642	45.1	125,058	29.9	22,683	5.4
Putnam	224,365	48,987	21.8	15,094	6.8	120,088	53.5	40,186	17.9
Raleigh	390,496	64,803	16.6	89,691	23.0	139,767	35.8	96,235	24.6
Randolph	669,658	106,185	15.9	183,770	27.4	246,439	36.8	133,264	19.9
Ritchie	291,373	20,927	7.2	24,814	8.5	167,691	57.6	77,941	26.7
Roane	311,168	14,560	4.7	28,589	9.2	177,640	57.1	90,379	29.0
Summers	235,366	22,354	9.5	50,368	25.2	135,134	57.4	18,510	7.9
Taylor	113,402	13,406	11.8	34,455	30.1	65,841	58.1	-	-
Tucker	269,869	84,250	31.2	44,809	16.6	100,679	37.3	40,131	14.9
Tyler	166,477	22,118	13.3	14,791	8.9	114,566	68.8	15,002	9.0
Upshur	227,110	46,994	20.6	77,662	34.1	76,264	33.5	26,190	11.8
Wayne	331,443	32,305	9.8	29,123	8.8	169,215	51.0	100,800	30.4
Webster	357,504	26,951	7.5	57,373	16.1	126,678	36.2	143,502	40.1
Weizel	230,701	16,366	7.1	1,821	0.7	80,942	35.1	131,572	57.1
Wirt	150,022	15,961	10.6	5,450	3.7	89,960	59.9	38,6512	25.8
Wood	241,805	56,972	23.6	40,142	16.6	130,955	54.1	13,736	5.7
Wyoming	324,672	12,817	3.9	11,510	3.6	97,464	30.0	202,881	62.5
Totals	15,404,800		16.0		18.0		38.0		28.0

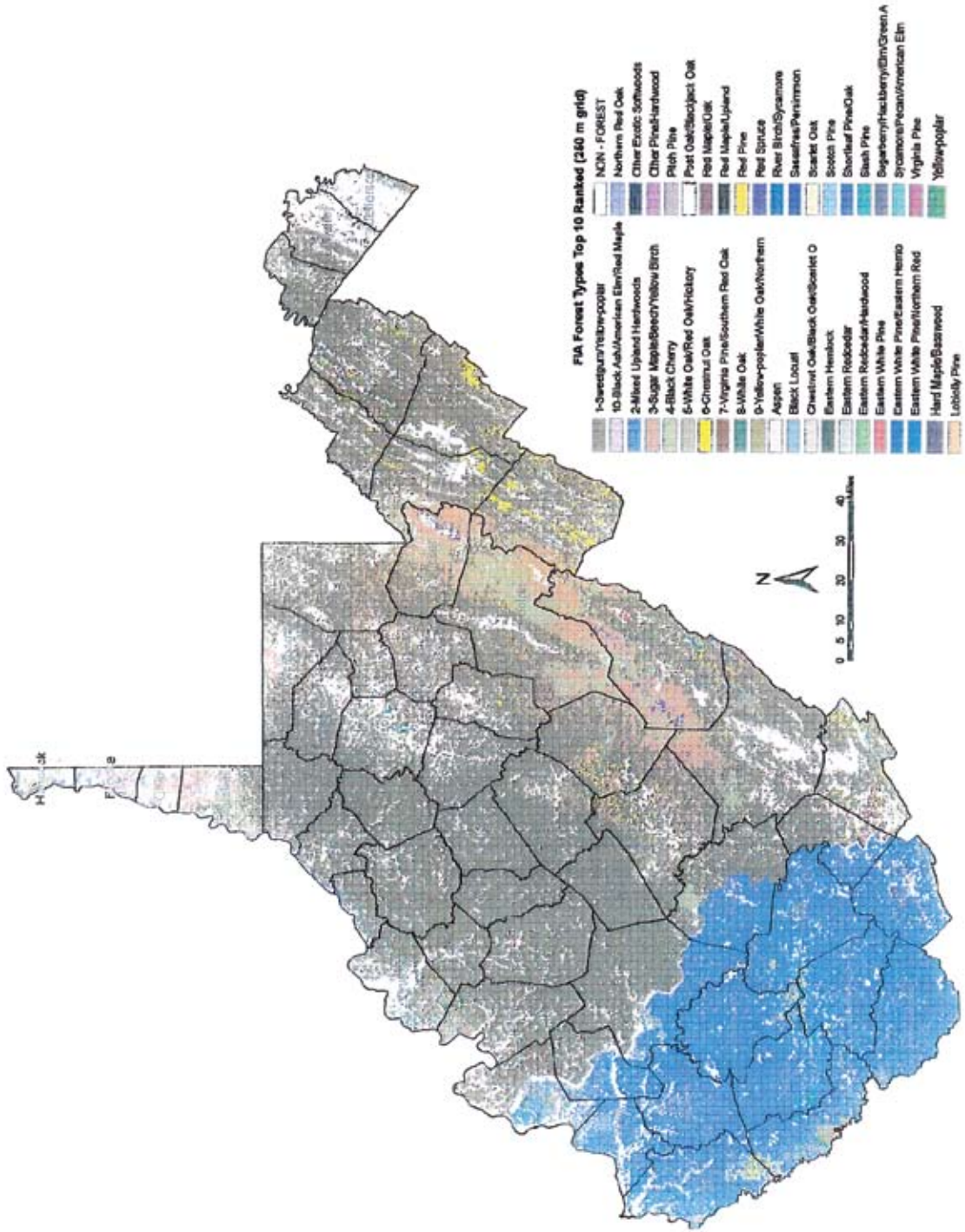
Appendix G. Maps Showing Elevation Classes and Other Ecological Data.

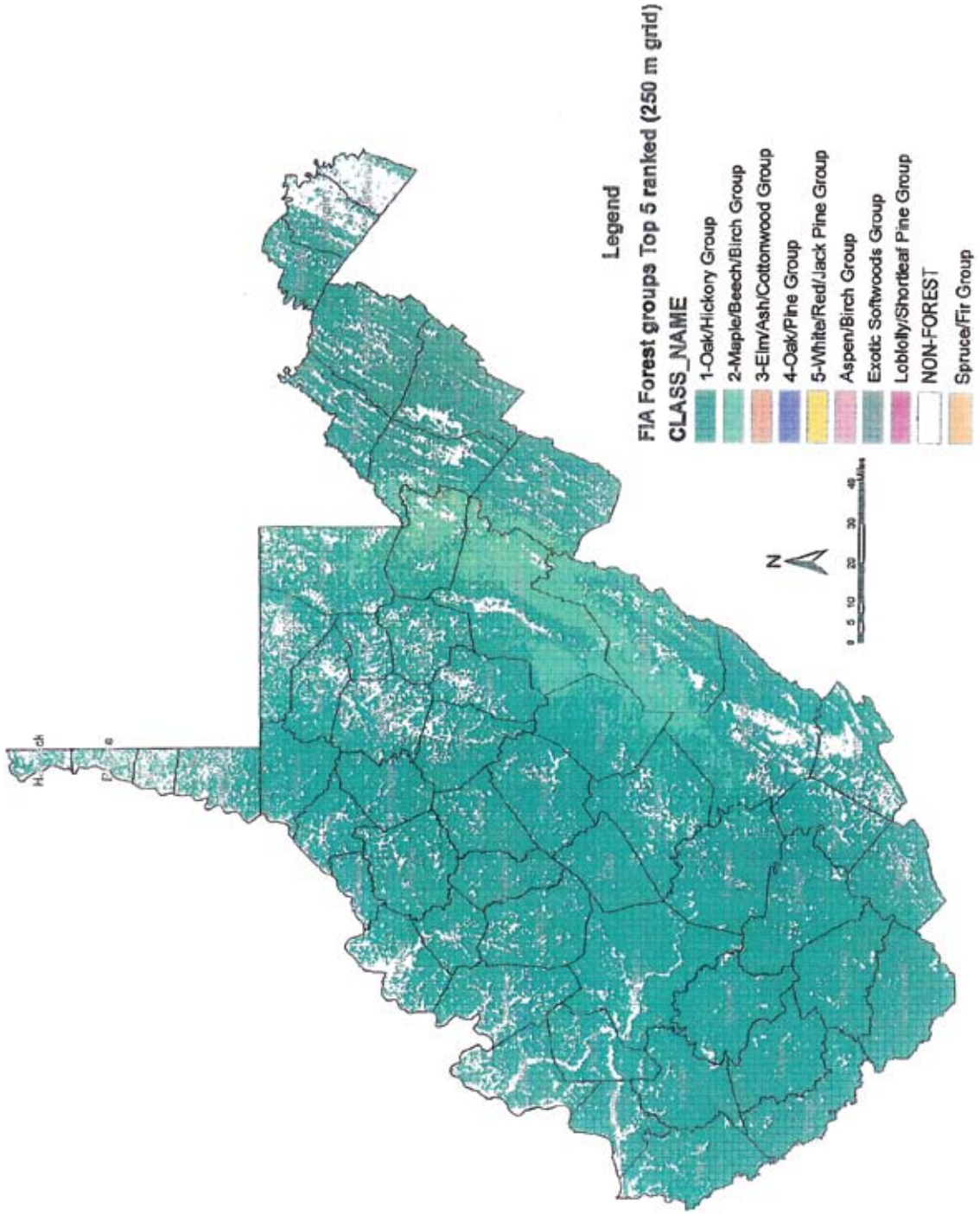


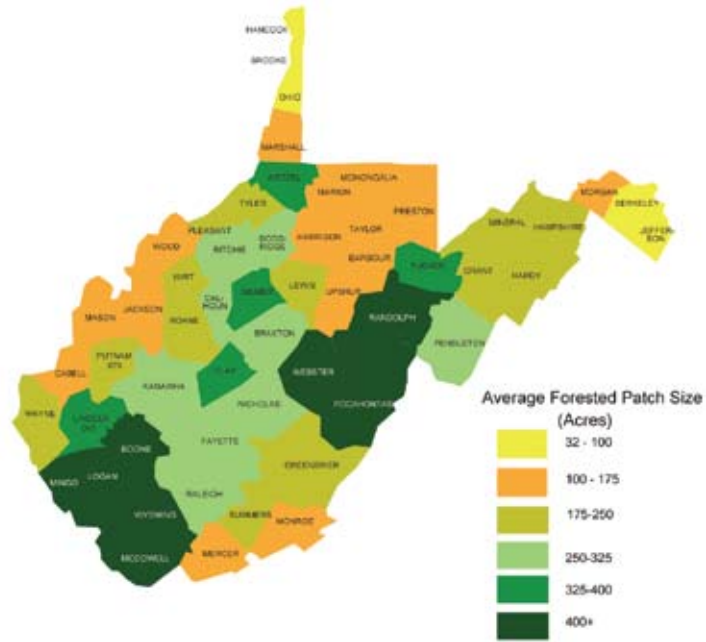
GEOLOGIC MAP OF WEST VIRGINIA

WEST VIRGINIA GEOLOGICAL AND ECONOMIC SURVEY

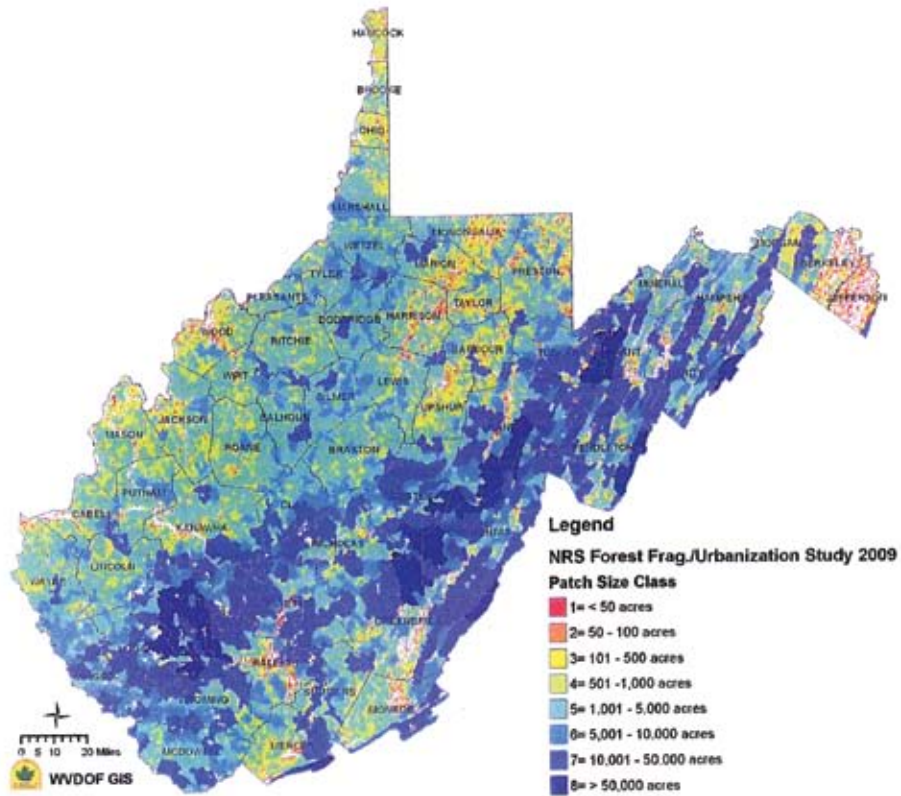


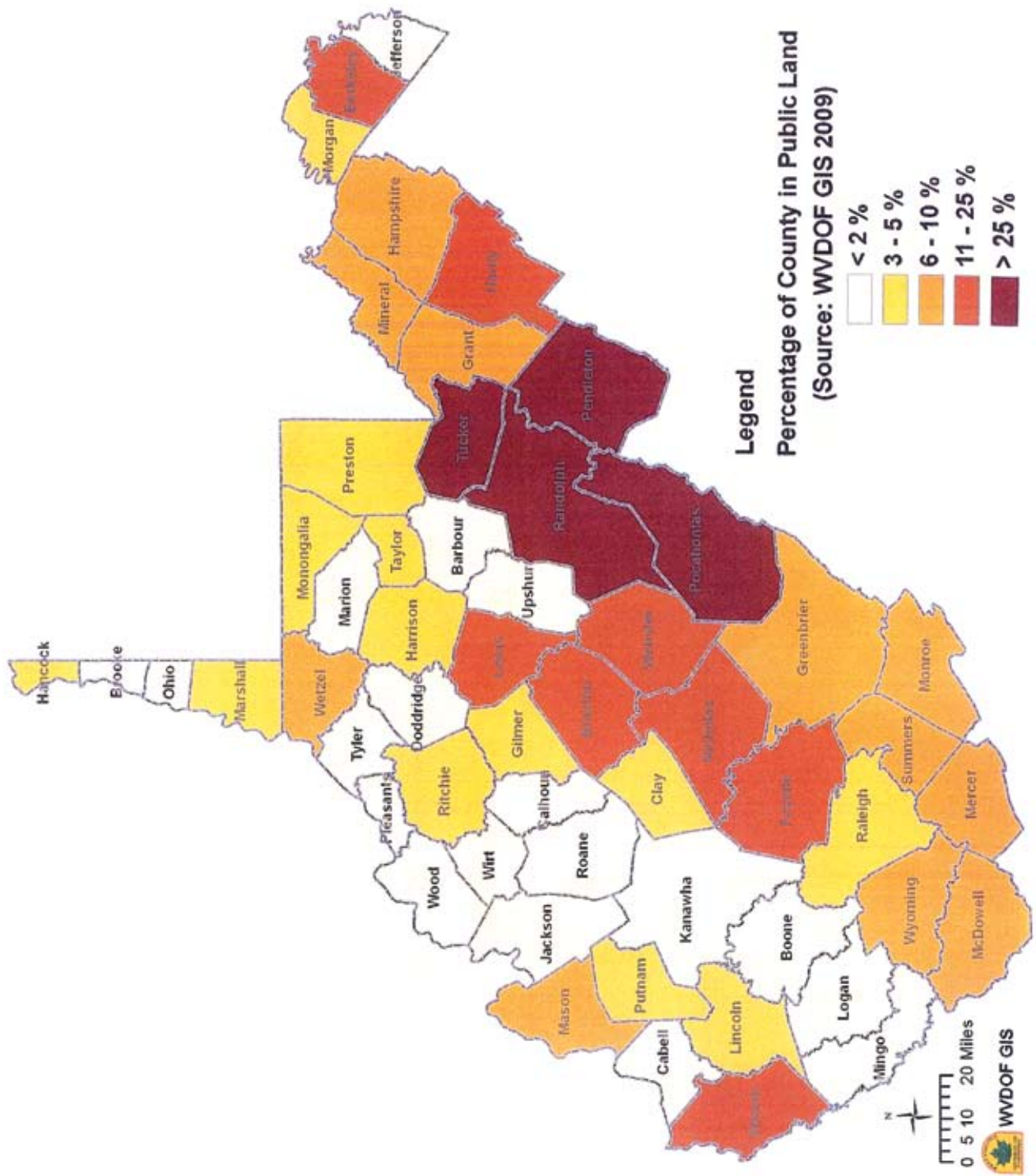






Average size of forest patches, West Virginia, 1990.





West Virginia Forest Facts

(2007 Forest Inventory & Analysis)

All WV Land	100%	15.4 million acres
WV Forestland	78%	12.0 million acres
WV Timberland*	77%	11.8 million acres

(*Omits reserved & unproductive forestland)

Number of Trees

Total	5,998 million
Per person**	3,314

(**based on US Census – 2007 est.)

Forestland Owners

Number of private owners	251,441
Median ownership area	10-19 acres
Median owner age	59

Forestland Area by Ownership

Company	26%
Other private	61%
State (incl. county & municipal)	3%
National Forest	9%
Other Federal	1%

Forestland Area by Age

More than 100 yrs.	4%	■
81-100 years old	16%	■ ■
61-80 years old	38%	■ ■ ■ ■
41-60 years old	27%	■ ■ ■ ■
21-40 years old	10%	■ ■
1-20 years old	5%	■

Annual Growth, Removal and Mortality

Growth	1,936 million board feet
Removals	477 million board feet
Mortality	419 million board feet
Ratio of Growth/Removal	4-1

West Virginia Wood Use

Wood use	640 million board feet
Per person	355 board feet (national average)

Carbon Stored in Forest (excludes soil)

Total	1,024 million metric tons
Per person	566 metric tons

Major Forest Ingredients:

Oak/Hickory, Maple/Beech/Birch, Oak/Pine

Minor Forest Ingredients: Elm, Ash, Sycamore, Cherry, Red Spruce, Hemlock, Shortleaf Pine

Enjoy West Virginia's forests every day.
They are good for you.



West Virginia's Forest Resources, 2008

Research Note NRS-

This publication provides an overview of forest resource attributes for West Virginia based on an annual inventory conducted by the Forest Inventory and Analysis (FIA) program at the Northern Research Station of the U.S. Forest Service. These estimates, along with web-posted core tables, will be updated annually. For more information, please refer to page 4 of this report.

Table 1. – Annual estimates, uncertainty, and change

	Estimate 2008	Sampling error (%)
Forest Land Estimates		
Area (1,000 acres)	11,974	0.7
Number of live trees 1-inch diameter or larger (million trees)	6,196	1.6
Dry biomass of live trees 1-inch diameter or larger (1,000 tons)	785,478	1.1
Net volume in live trees (1,000,000 ft ³)	27,102	1.2
Annual net growth of live trees (1,000 ft ³ /year)	697,512	2.4
Annual mortality of live trees (1,000 ft ³ /year)	225,715	4.5
Annual harvest removals of live trees (1,000 ft ³ /year)	336,536	8.5
Annual other removals of live trees (1,000 ft ³ /year)	14,283	27.0
Timberland Estimates		
Area (1,000 acres)	11,721	0.7
Number of live trees 1-inch diameter or larger (million trees)	6,065	1.7
Dry biomass of live trees 1-inch diameter or larger (1,000 tons)	766,234	1.2
Net volume in live trees (1,000,000 ft ³)	26,408	1.3
Net volume of growing-stock trees (1,000,000 ft ³)	25,037	1.3
Annual net growth of growing-stock trees (1,000 ft ³ /year)	609,306	2.4
Annual mortality of growing-stock trees (1,000 ft ³ /year)	168,603	4.5
Annual harvest removals of growing-stock trees (1,000 ft ³ /year)	286,179	8.6
Annual other removals of growing-stock trees (1,000 ft ³ /year)	35,537	26.2

Note: When available, sampling errors/bars provided in figures and tables represent 68 percent confidence intervals

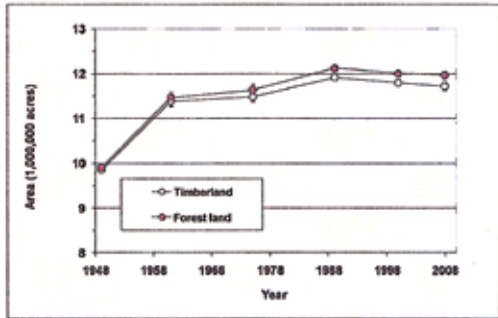


Figure 1. – Area of timberland and forest land by year.

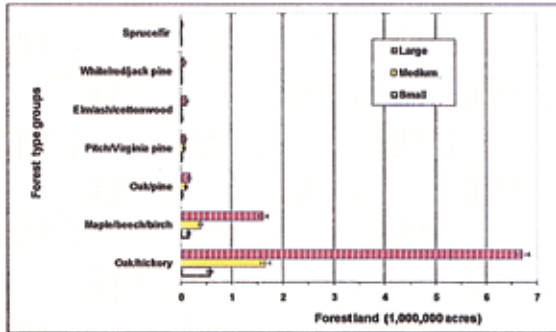


Figure 2. – Area of forest land area by top seven forest type groups and stand size class, 2004-2008.

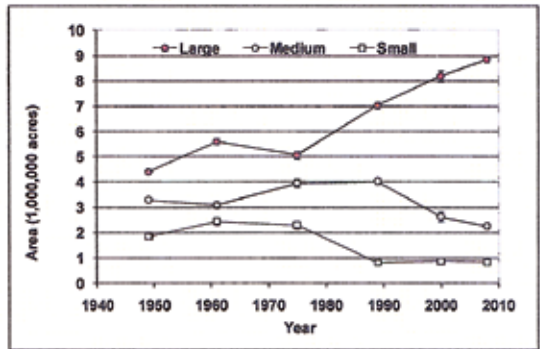


Figure 3. – Area of timberland by stand size class and year.

Table 2. – Top 10 tree species by statewide volume estimates, 2004-2008

Rank	Species	Volume of live trees on forest land (1,000,000 ft ³)	Sampling Error (%)	Proportion of total live tree volume (%)	Volume of sawtimber trees on timberland (1,000,000 bdf)	Sampling error (%)	Proportion of total sawtimber volume (%)
1	Yellow-poplar	3,895.7	4.1	14.4	15,729	4.8	17.9
2	Red maple	2,440.7	3.8	9.0	5,823	5.5	6.6
3	Chestnut oak	2,407.9	4.4	8.9	7,609	5.2	8.7
4	White oak	2,349.2	4.2	8.7	8,535	5.0	9.7
5	Northern red oak	2,140.2	5.0	7.9	9,160	6.0	10.4
6	Sugar maple	1,892.7	4.5	7.0	5,157	6.5	5.9
7	Black oak	1,248.4	5.7	4.6	5,030	6.9	5.7
8	American beech	1,062.4	6.2	3.9	3,460	8.4	3.9
9	Black cherry	1,023.0	8.0	3.8	3,267	10.7	3.7
10	American basswood	798.1	8.6	2.9	3,143	10.0	3.6
	Other softwoods	1,413.9	6.2	5.2	4,171	7.9	4.7
	Other hardwoods	6,429.8	2.1	23.7	16,842	3.1	19.2
	All Species	27,102.1	1.2	100.0	87,926	1.7	100.0

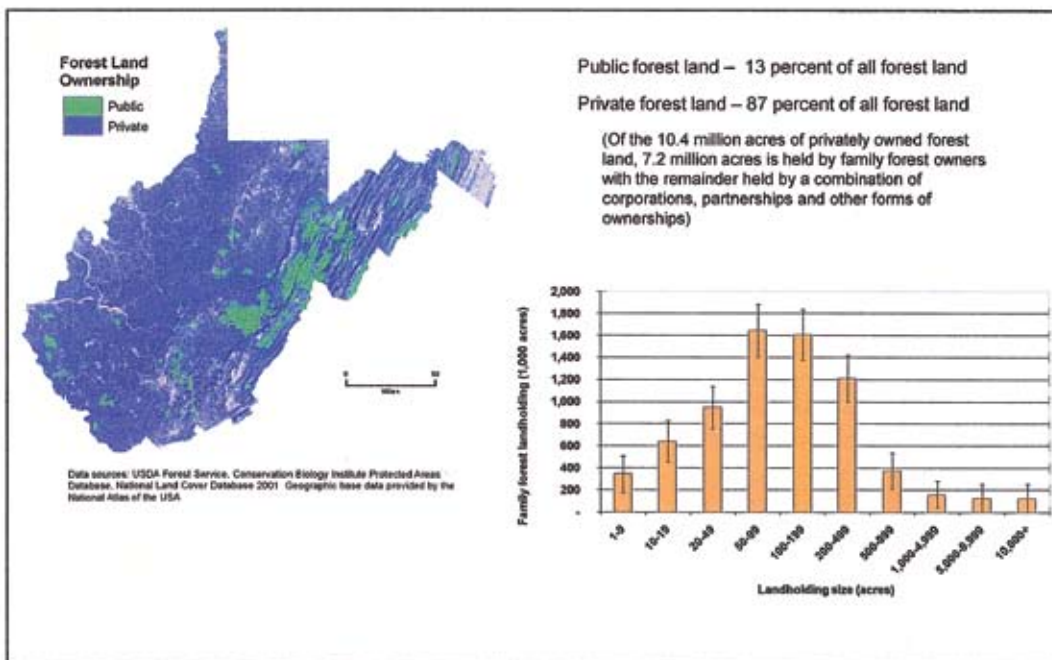


Figure 4. – Area of forest land by major owner group (2008) and size of private family forest landholding (2006).

Appendix H. Two Centuries of West Virginia Forest Utilization.

People may have arrived in what is now the eastern United States 20,000 or so years ago, but we know little of them. We do know that people occupied the area a few thousands of years later as shown by archeological findings. They formed villages, burned the landscape repeatedly to clear it and to assist in hunting game and grew crops such as corn and squash. In the very early 1500s, diseases initially brought into what is now Florida by European sailors swept through the area decimating the inhabitants. The river bottom crop lands reverted to trees and the villages disappeared. This “second” generation of trees formed the forests that were so abundant when the first European colonists arrived.

This second forest, more than 200 and possibly 300 years old was cleared quite early. The flatter areas of the Eastern Panhandle, being nearer to Virginia and Pennsylvania, were first. By the late 1800s, some counties such as Berkeley, Jefferson, and in the Northern Panhandle, Ohio, Hancock and Brooke, and the counties near Pennsylvania, Monongalia and Harrison were 90 percent cleared. Mountain counties were spared due to the steepness of slope with Randolph reported as being 30% cleared by the 1894 Board of Agriculture. In the same report, Webster County was reported as being only 15% cleared.

The coming of industrialization resulted in a lot of change. Large tracts of forestland were clearcut, mostly between 1880 and 1910, to feed huge sawmills that had sale for their products in the rapidly enlarging railroad system that was moving civilization westward and for building construction in frontier towns. Professional forestry had not yet arrived in the United States. There were no legal impediments to harvesting trees, but confiscatory taxation policies often resulted in lumber companies selling the land soon after it had been cleared. In 1911-12, the West Virginia Department of Agriculture even had a program to assist timberland owners in subdividing their denuded land to sell for small farms. In 1909, the West Virginia Legislature passed a law allowing the federal government to purchase land in West Virginia. This eventually resulted in the acquisition of thousands of acres of logged lands for what is now the Monongahela National Forest. The largest purchase, nearly an entire Ranger District, the Gaultey, (253,000 acres), was purchased for \$2.50 an acre from the Cherry River Boom and Lumber Company in the early 1930s when President Franklin Roosevelt made \$20,000,000 available for such purchases in the eastern U. S. Timber harvesting peaked in 1909 when more than 1,500 mills sawed nearly one and one-half billion board feet of lumber. The harvest slowed markedly after the 1930s with the last large tract of uncut timber being removed from the upper Elk Watershed, above the town of Bergoo during the late 1930s and early 1940s.

In 1946, the U. S. Forest Service initiated state-by-state decennial inventories of the timber resource. The first report on West Virginia was published in 1949. This was followed by reports in 1961, 1975, 1989, 2000 and 2010. This scientifically credible information records the amount of forest, the species, board feet volume and health, rate of growth and annual mortality. Permanent plots have been randomly established on the ground for each 5,750 acres. Thousands of aerially viewed plots are also used to expand the sampling. Beginning in 2009, one fifth of the state's acreage will be sampled annually and reports can be expected each five years.

A 2007 report indicated that oaks had dropped from 39 to 34 percent of the forest population in the roughly 50 years. During this same time, yellow poplar increased from seven to 15 percent and red maple from four to nine percent. Red maple is now the number one tree in numbers in the state and yellow poplar is the number one tree in volume. Unfortunately, red maple is not a long lived tree, does not grow into large volume specimens and is very subject to decay. As for oaks, years of research has shown

that there are two key requirements — oak reproduction must be present whenever logging occurs and crop trees need to be released by timber stand improvement cuttings to favor development over time. A 2008 research paper stated a good rule of thumb is to have one oak crop tree in the immature stand for every percentage point of oak stocking desired in the mature stand. The report also indicated that the acreage in farms was only about half of that of 1950. Much of this idle land had reverted to trees. During this period trees have increased steadily in size and more than half of the stands are now fully stocked or even over stocked. More than three percent of all trees in the forest more than five inches d.b.h. are dead, an indication of the competition that results in taller and better trees. Importantly, there are 14 dead trees (the average) five inches or larger d.b.h. on each acre of the state's timberland. These are often referred to popularly as wildlife condominiums. Many, if not most, of these changes are attributable to three factors - the growing up of idled farmland, non-professional harvesting without proper attention being paid to oak regeneration and an over-abundant whitetail deer population.

The number of mills is now less than 100, but these are much more powerful and saw much faster and with much less waste. This small number can still cut over one billion board feet per year. The economy and enough loggers to cut trees are the only hindrances.

In 1985, the West Virginia FMRC asked for a report on forestry with a strategic plan. After a year of concentrated study by several dozen professional foresters and allied individuals it was published by the FMRC (1986). Budgetary restrictions and governmental policy prevented much of it from being implemented. Many of the forest problems identified at that time remain major problems. This report is the second FMRC effort although the Division of Forestry has issued specific discipline plans, such as for Urban Forestry, and two comprehensive, but brief statewide plans.

Appendix I. The Industry.

Historically, the industry has been divided into lumber and paper segments. This is still true for West Virginia, but panel products and wood pellet manufacturing have entered the competition for the smaller bolts such as come from timber stand improvement and tree top residues. The solid wood segment has been increased by prefabricated and log home manufacturing and by veneer and cabinet plants.

Some of the basic manufacturing facilities, both primary and secondary, are having economic troubles as a result of increasing labor costs, especially in the provision of fringe benefits and from foreign competition with manufacturing in general. From 1995 to the present, 26 mills have closed, 13 permanently. It is predicted that the world demand for forest products will continue to grow as the population increases. Unfortunately, many of the larger companies have unloaded their land base and there is concern that some may close their businesses. In recent years, government tax regulations have opened the door for different type of investment groups (TIMOs & REITs), but no one seems assured that these will be permanent, especially those that don't own the land.

West Virginia's economy will become increasingly dependent on the 78 percent of the state that is the wood industry and so it is vital that advance planning guides every step. Will there be a renewed need for additional agricultural land as the population soars? Will natural climate changes change growth habits? Will the growing number of small landowners reduce the acreage that can be counted on to produce timber? Will popular emotion due to scare scams result in buzz word forestry policy which might overall be detrimental? Will inventories be coordinated and reported on the same scale as removals? Will there be constant pressure on politicians, through misleading advocacy campaigns, to enter more timberland into wilderness reservations resulting in timber shortages and an obstacle to effective environmental management? Will the profession, in the current declining economy, be able to sell intensive forest management as being cost beneficial? What can be done to convince the population that public lands at the municipal, county and state levels if managed for timber production will actually produce more of the other benefits that they seem to desire? What can be done to convince small landowners, those with less than 100 acres, that professional forestry is a paying proposition with no bad side effects? Is there a need for timberland regulations as some states have adopted on timber harvesting and planning for regeneration? Is the current preferential tax law working? Is all timberland taxed as it should be? What has been the trend towards smaller properties and what is the prediction as to whether they will be managed for timber production? Is there a need for a different type of landowner assistance program? Has the competitive position of the United States been compromised by the global and domestic financial conditions and if so what can be seen for West Virginia? Will tariffs and quotas become more common? These are just a few of the questions that will have to be answered by the state's natural resource agencies as critical planning becomes an integral part of the timber industry.

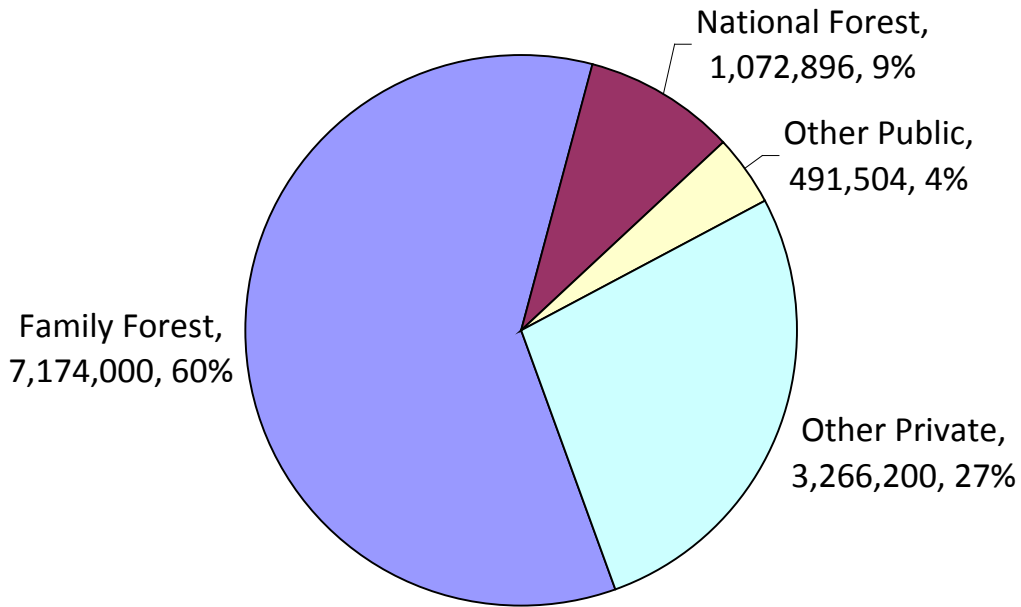
West Virginia mounted a great effort in the late 1980s to reinvigorate forestry within the state and to attract new secondary forest industry. This effort resulted in six new plants that utilize low grade logs and lumber, thus allowing intensive forest management to be practiced at a profit. Efforts were made to change the timber taxes to be more in line with the surrounding states and to be more competitive, but

this was never completed. It was at much this same time that much of the statewide extension effort to educate landowners by state university personnel was dropped. Unfortunately, timber is still regarded by most landowners as an extractive item that just grows with little or no input or investment instead of the agricultural type crop that it actually is.

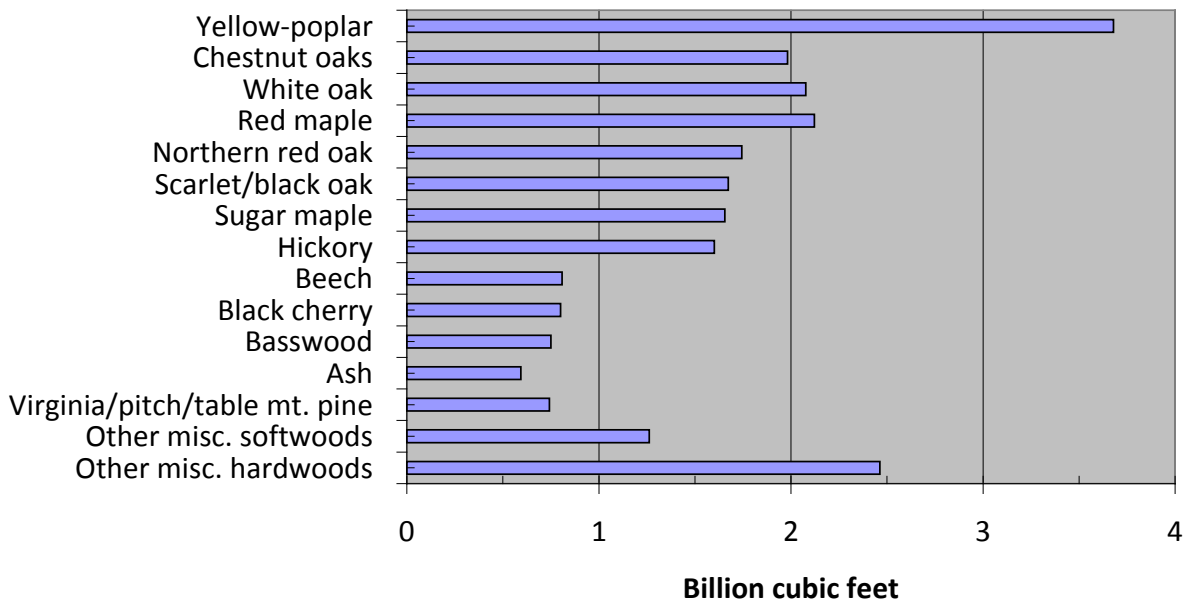
Current stumpage price data has become and continues as a problem. Prices are currently very low and landowners find it hard to sell at such prices. Increased stumpage prices would help greatly in increasing levels of forest management and might move forest management from the commodity production profit motive to that of forest land stewardship.

Appendix J. Current Selected West Virginia Forest Statistics.

Ownership of forest land, West Virginia, 2007.

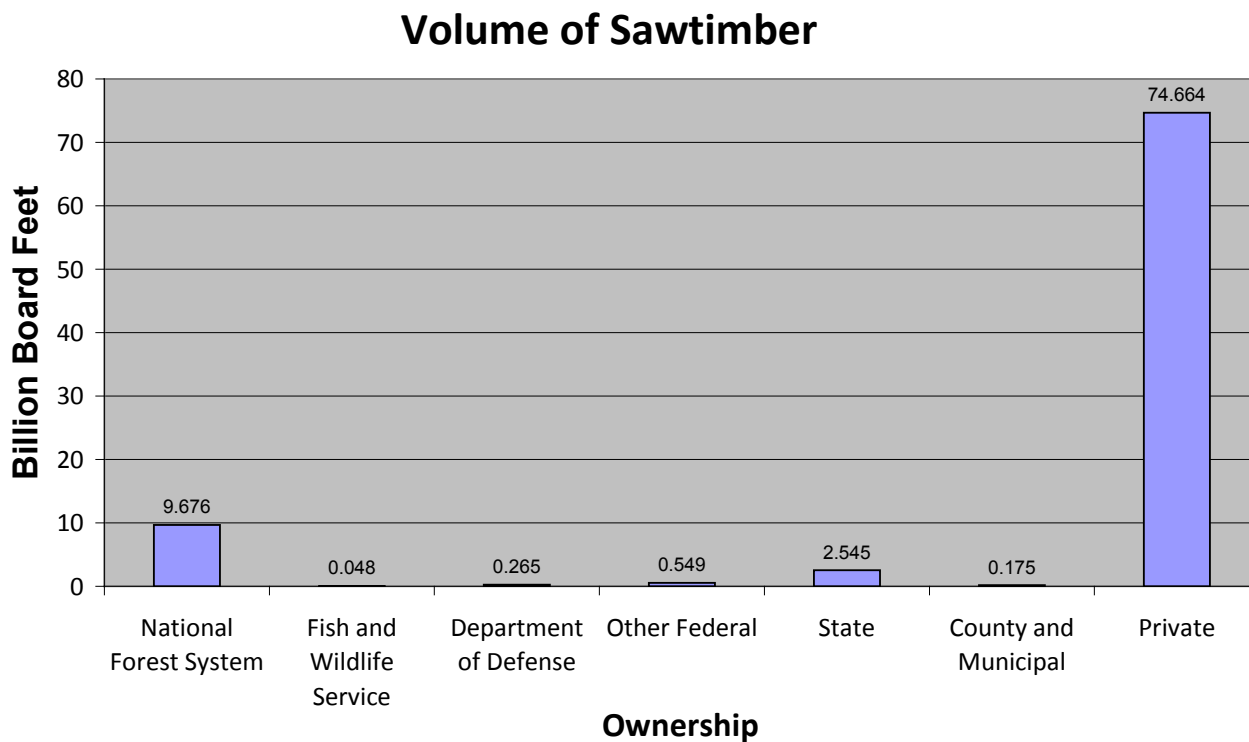


Growing-stock volume on timberland, West Virginia, 2008.



West Virginia Elevation Classes with Approximate State-Wide Acreages		
Class	Elevation Range (ft)	Approximate Acreage State-Wide
1	223 – 500	122,393
2	501 – 1,000	3,800,871
3	1,001 – 2,600	8,718,745
4	2,601 – 3,000	1,101,149
5	3,001 – 4,862	1,208,189
5a	3,200 – 3,500	363,443
5b	3,500 – 4,862	520,785

NOTE: Elevation class acreage is an approximate sum calculated from 30 meter resolution USGS DEM grids.



Appendix K. Important Resources.

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Appendix L. West Virginia Code – Forest Management Commission.

WEST VIRGINIA CODE

CHAPTER 5. GENERAL POWERS AND AUTHORITY OF THE GOVERNOR, SECRETARY OF STATE AND ATTORNEY GENERAL; BOARD OF PUBLIC WORKS; MISCELLANEOUS AGENCIES, COMMISSIONS, OFFICES, PROGRAMS, ETC.

ARTICLE 24. WEST VIRGINIA FOREST MANAGEMENT REVIEW COMMISSION.

§5-24-1. Short title.

This article shall be known by and may be cited as “The Forestry Development Act of 1987.”

§5-24-2. Legislative findings, purposes and intent.

The Legislature hereby finds and declares:

- (a) That the future economic base of West Virginia is tied to the development of the forestry industry.
- (b) That efforts to enhance and promote the expansion of the forestry industry should be coordinated among the several state and federal agencies, commissions, boards, committees, associations and other entities.
- (c) That the development of the forestry and wood products industry will require: (1) The development of multiple-use, sustained-yield management plans for nonindustrial timber tracts; (2) the development of products and markets for the grade of materials that currently comprise a majority of the state’s available resources; (3) a stable and predictable tax program for both new and existing firms; (4) a centralized protection program that will reduce risk from fire and pestilence; and (5) financial assistance for the attraction and expansion of new and existing secondary manufacturing facilities with special emphasis on assistance for smaller firms employing less than twenty persons.
- (d) That the present and future welfare of the people of the state require, as a public purpose, a continuing effort toward the promotion and development of the forestry and wood products industry.
- (e) In recognition of these findings and purposes, it is in the best interest of this state to create the West Virginia forest management review commission as a statutory body.

§5-24-3. Commission continued; composition; appointment of members.

The West Virginia forest management review commission

heretofore created is hereby continued for the purposes set forth in this article. This commission shall be comprised of five members from the West Virginia Senate, a co-chairman and four members to be appointed by the Senate president, and five members of the House of Delegates, a co-chairman and four members to be appointed by the speaker; four members to be representatives from the commercial forest industry in the state, and three members of the public-at-large. The seven nonlegislative members shall be appointed by the governor, with the advice and consent of the Senate. Two members shall be appointed to serve a term of two years; three members shall be appointed to serve a term of four years; and two members shall be appointed to serve a term of six years. The successor of each such appointed member shall be appointed for an overlapping term of six years, except that any person appointed to fill a vacancy occurring prior to the expiration of the term for which the predecessor was appointed shall be appointed only to the remainder of such term. Each board member shall serve until the appointment of his or her successor.

§5-24-4. Powers, duties and responsibilities.

The commission shall have the power, duty and responsibility to:

- (a) Generally assist in the retention, expansion and attraction of forestry and forestry related industries by creating a climate for the development and support of the industry.
- (b) Coordinate the current efforts to enhance and promote the expansion of the forestry industry among the several state and federal agencies, commissions, boards, committees, associations and other entities.
- (c) Urge the development of multiple-use sustained-yield management plans for nonindustrial timber tracts.
- (d) Develop products and markets for the grade of materials that currently comprise a majority of the state's resources.
- (e) Recommend a stable and predictable tax program for both new and existing firms in the state.
- (f) Develop a centralized and enhanced protection program that will reduce risks from fire and pestilence.
- (g) Develop financial assistance for the attraction and expansion of new and existing secondary manufacturing facilities, with special emphasis on assistance for smaller firms employing less than twenty persons.
- (h) Utilize recognized research expertise of appropriate existing educational, public and industrial institutions or agencies of the state. Research shall include economic development efforts in West Virginia, including silviculture, wood land management, forest management, the development of new products as well as other products designed to aid forestry development.
- (i) Employ, if needed, and only with prior approval of the West Virginia Legislature's joint committee on government and finance, such staff as may be necessary. In the event an executive director may be necessary, such individual shall be a forestry graduate of a four-year college of forestry and shall, in addition, have administrative and research experience, preferably, but not mandatorily, with at least five years' experience in government.

§5-24-5. Appalachian hardwood research center; creation; duties; responsibilities.

The appalachian hardwood research center is hereby created, in association with, and the director shall be a member of the faculty of, the forestry school at West Virginia University. The center shall utilize, to the extent possible, the programs already created under the vandalia partnership program as provided for in chapter five-b, article two-a, section four, et seq., of this code.

The appalachian hardwood research center at West Virginia University is directed to establish priorities and coordinate its research functions with the governor and the Legislature. The center shall: (1) Develop and maintain a computerized inventory of all possible scientific information relating to appalachian hardwood tree species, silviculture, management, products and product development; (2) initiate research projects, including applied research, either originally or by request, designed to aid forestry economic development efforts in West Virginia, including the development of new products as well as other projects designed to increase the utility of low grade appalachian hardwoods; and (3) be generally responsible for encouraging the development of research needed by the forest industry of the state.

§5-24-6. Compensation and expenses of members; expenses of the commission.

The members of the commission shall be reimbursed for all of their reasonable and necessary travel and other expenses incurred in connection with carrying out their duties as members, which expenses shall be paid in the manner and form prescribed by law. Members of the commission may receive no other compensation for their services on or with the commission.

§5-24-7. Reports.

The commission shall report to the Legislature's joint committee on government and finance as to the progress being made in forestry development activity by state governmental entities and projects, and shall report, at least annually, but more often if requested, the financing deemed necessary to continue funding, if desired, of forestry development activities.

§5-24-8.

Repealed.

Acts, 1997 Reg. Sess., Ch. 58.

Appendix M. Forest Management Review Commission - Interim.

Senate Members	House Members	Agency/Citizen Members
Senator Helmick - Chair Senator Bowman Senator Facemire Senator Facemyer Senator Williams	Delegate Michael - Chair Delegate Caputo Delegate Romine	Robert Alexander Richard Bowlby Betty D. Crookshanks Thomas Hawse, III Ed McCoy Lannes C. Williamson James Willison
Committee Agenda Agenda		Committee Staff Deborah Davis George Freeman Noelle Starek