Paint Creek

State Scenic River Designation Study

June 2021

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A Study of Paint Creek and its Tributaries for Inclusion in Ohio's Scenic Rivers System

Prepared By

John Ritter
Professor of Geology and Environmental Science
Wittenberg University

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Executive Summary

Paint Creek, including its tributaries-North Fork Paint Creek and Rattlesnake Creek in Ross County, Upper Paint Creek upstream of Paint Creek Lake along the border between Ross and Highland Counties, and Rocky Fork Creek downstream of Rocky Fork Lake in Highland County-is recommended for designation as an Ohio Scenic River.

Paint Creek and its tributaries are a resource of state significance because of their numerous unique and distinctive characteristics. This is largely because the Paint Creek watershed extends across the most distinctive physiographic boundary in Ohio, the Allegheny Escarpment. The Allegheny Escarpment separates the rugged hills of the glaciated and unglaciated Allegheny Plateau in the southeast from the lowrelief glaciated till plains in the northwest. Straddling this boundary, Paint Creek and its tributaries flow in valleys that were ancestral, tributary to the ancient Teays River, but were buried and reoccupied by glacial meltwater streams during deglaciation. Valleys of these streams are broad and flat with distinct uplands along valley walls. Streams within these valleys are currently meandering, with a legacy of meandering on their floodplains and terraces. Their stream corridors are now dominated by cultivated crops, hay, and pasture, but retain many of the aesthetic qualities of a rural river system at the time of settlement of Ohio. Where Paint Creek and its tributaries have created valleys in bedrock and glacial till, whether in the till plains or the plateau, the valleys are narrow and V-shaped, exposing bedrock and dominated by forest cover.

The diverse topography, geology, and geologic history of the Paint Creek watershed and its tributary streams provide a diversity of habitats for plants and animals. Although a comprehensive study is not available for the watershed, available studies and entries in the Ohio Department of Natural Resources Natural Heritage Database indicate at least 11 state-listed endangered species of mussels, fish, and plants have been found in the Paint Creek watershed in recent surveys. Two of the mussel species, the snuffbox mussel *(Epioblasma triquetra)* and the rayed bean mussel *(Villosa fabalis)*, are also on the federal list of endangered species. The concentration of protected land along Paint Creek and its tributaries, some of which provides habitat for these species, is exceptional in area and diversity. It is managed by an impressive array of federal, state, county, and municipal agencies, as well as private conservancy organizations, and is critical to sustaining habitat for threatened and endangered species.

Equally impressive in the Paint Creek watershed is its human history. Human occupation of the stream valleys of the Paint Creek watershed has been semicontinuous since Paleoindian time. The concentration of ceremonial and burial earthworks suggest it was the center of the Hopewell Culture, and artifacts and raw material excavated from Adena and Hopewell sites indicate it was a network for trade across North America. The Hopewell Culture is defined by earthworks located in Ross County, including those in the Paint Creek watershed. Hopewell Mound Group, along the banks of North Fork Paint Creek, and Seip Earthworks, along the banks of Paint Creek, are nominated as World Heritage sites. The nomination states that "Ohio's Hopewell earthworks are the pre-eminent examples, and the largest concentration in the world, of prehistoric monumental landscape architecture" (World Heritage Ohio, 2018). Much later, during historic Native American Indian time, the home of the Shawnee tribe leader was traditionally known as Chillicothe; at least one location in the watershed, at present-day Frankfort along North Fork Paint Creek, was known as Chillicothe. Modern Chillicothe was Ohio's first state capital.

Finally, Paint Creek in Ross County, from rivermile (RM) 5.3 near Chillicothe upstream to RM 26.2 west of Bourneville, for 20.4 miles[1], meets or exceeds all criteria established by Ohio Revised Code 1547.81 for scenic river designation and thus is recommended for designation as an Ohio Scenic River. It is further recommended that the designation include a total of 81.7 miles on Paint Creek (RM 3.9 to RM 39.2) and Upper Paint Creek (RM 46.5 to RM 52.2) and its tributaries, Rattlesnake Creek (RM 4.0 to RM 10.8), Rocky Fork Creek (RM 0.0 to RM 9.1), and North Fork Paint Creek (RM 0.0 to RM 25.3), in Ross and Highland counties.

[1] The discrepency between the difference in rivermiles (i.e., 20.9 mi) and distance (i.e., 20.4 mi) is a result of a meander cutoff along the Paint Creek reach between RM 22.5-23.3, which shortened the river by a distance of 0.5 miles.

Introduction

Ohio pioneered the river preservation movement with the enactment of Senate Bill 345 by the 107th General Assembly on February 28, 1968. The Ohio Wild, Scenic and Recreational River Act was the first of its kind and predated the National Wild and Scenic River Act, which was passed on October 3, 1968. The purpose of establishing a Scenic Rivers Program is to help protect and preserve the few remaining, high-quality natural rivers in the state.

The mission of the Ohio Scenic Rivers Program, administered by the Ohio Department of Natural Resources (ODNR), Division of Natural Areas and Preserves, is to work cooperatively with local governments, businesses, landowners, nonprofit organizations and other state and federal agencies to protect the aquatic resources and terrestrial communities dependent on healthy riparian habitats. The state's Scenic River Act provides for three categories of designation:

- **Wild rivers** are those which are generally inaccessible, the floodplain is undeveloped, the river is free flowing, and 75% of the adjacent corridor is forested to a depth of at least 300 feet.

- **Scenic river** designation is representative of a waterway which still retains much of its natural character for the majority of its length. Shorelines are for the most part undeveloped, but the river may exhibit signs of disturbance by human activities. The adjacent corridor must be forested to a minimum depth of 300 feet for 25% of the stream's length.

- **Recreational rivers** are those rivers which do not possess the same degree of natural quality found in wild or scenic rivers yet warrant protection due to unique cultural and/or important historical attributes. The influence of human activities is much more apparent on rivers with this classification.

Ohio currently has 15 designated wild, scenic, and/or recreational rivers comprising approximately 831 river miles. Three state designated streams, the Big and Little Darby Creeks, Little Beaver Creek, and Little Miami River are also designated as national scenic rivers.

ODNR recognizes that partnerships and local cooperation are critical to effective river preservation efforts. Rivers are studied for possible designation only after receiving resolutions of support from a majority of the local governments adjacent to the river. Designation studies incorporate extensive field investigations and data review with the assistance and input of numerous local organizations and individuals.

Upon designation of a river as wild, scenic, or recreational, the director of ODNR appoints a volunteer scenic river advisory council which represents local interests within the watershed. Members often include private citizens, local government officials, conservation organizations, and property owners. Scenic river advisory councils advise ODNR on local areas of concern and issues related to the preservation of a designated river.

Designation as a wild, scenic, or recreational river is not a river restoration tool designed to restore a degraded stream to an improved natural condition. It is much more effective as a means of recognizing the unique characteristics of a stream and coordinating river preservation activities among diverse state and local government agencies, organizations, and individuals. When combined with the statutory authority to review and approve publicly funded projects on designated rivers, this designation helps ensure that decisions and activities which may impact a river are conducted in an environmentally sensitive and responsible manner.

The purpose of this report is to determine whether Paint Creek and some of its selected tributaries (Figure 1) meet the standards for wild, scenic, or recreational river designation. This report will provide an overview of the Paint Creek watershed, including its cultural history, land use, geology and geologic history, and a summary of the Paint Creek reaches proposed for designation, including access to them, general character, and water quality. The objective of these sections of the report is to highlight features that make Paint Creek and its watershed distinctive compared to

other scenic rivers in Ohio. This is followed by a summary of the analysis of Paint Creek relative to the requirements for scenic river designation. The Ohio Scenic Rivers Program seeks to identify and designate the few remaining river systems which have retained their most natural characteristics. To best understand the context of the information provided in this report, it is important to recognize that the role of Ohio's Scenic River Act is to identify and protect those rivers and streams possessing characteristics of state significance.

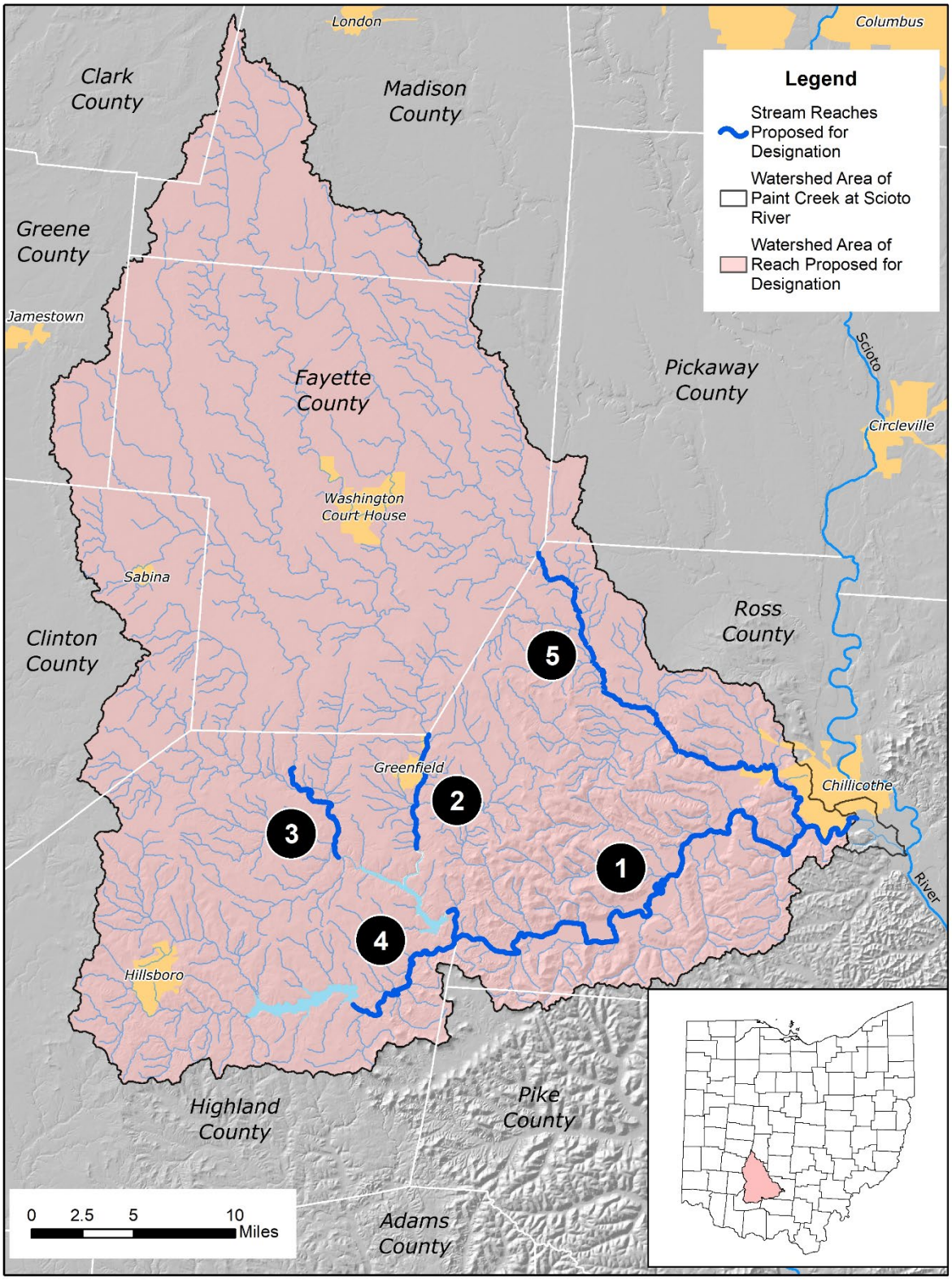

Figure 1. Location map of the Paint Creek watershed and the reaches examined for scenic river designation: 1 - Paint Creek, 2 - Upper Paint Creek, 3 - Rattlesnake Creek, 4 - Rocky Fork Creek, and 5 - North Fork Paint Creek.

Description of the Paint Creek Watershed

General Overview

Located in southwestern Ohio, Paint Creek is tributary to the Scioto River. Its watershed at the confluence with the Scioto River is 1,141.4 square miles and encompasses portions of nine counties: Clark, Clinton, Fayette, Greene, Highland, Madison, Pickaway, Pike, and Ross. The reaches proposed for scenic river designation include the mainstem of Paint Creek in Ross County, Upper Paint Creek, above Paint Creek Lake along the border between Ross and Highland counties to the Fayette County line, North Fork Paint Creek in Ross County, and Rocky Fork Creek downstream of Rocky Fork Lake in Highland and Ross counties. These stream segments total 81.7 miles in length, in Ross and Highland counties, with a watershed area of 1,136.1 square miles (Figure 1 and Table 1). The Paint Creek watershed and the reaches of Paint Creek proposed for designation are largely accessible by U.S. Routes 35 and 50 and State Route 41 (Figure 2). An estimated 104,000 people (based on 2010 U.S. Census block data) live within the Paint Creek watershed, concentrated in the larger population centers, including Chillicothe, Washington Court House, Greenfield, and Hillsboro. At least 5.8 million people in Ohio and northern Kentucky (based on 2010 U.S. Census block data) live within a one-hour drive of the watershed.

Watersheds and river reach locations are defined by various methods. In this document, a watershed will be identified using its Hydrologic Unit Code (HUC). The numbering convention used in assigning HUCs allows for recognition of the larger watershed in which smaller watersheds are contained. For example, the Ohio River Watershed HUC is 05; the Scioto River HUC is 0506 where the 05 indicates that the Scioto is a subwatershed of the Ohio River. The Paint Creek HUC 05060003 begins with 05, indicating that it is a subwatershed of the Ohio River, and is followed by 06, indicating that it is a subwatershed of the Scioto River as well. At the downstream end of the reach that is proposed for designation, it is comprised of 10 different subwatersheds at the 10-digit HUC scale, each assigned a unique 10-digit HUC, starting with 05060003 indicating that these are all subwatersheds of the larger Paint Creek Watershed (Figure 3 and Table 2).

River reach locations are defined by the Ohio Environmental Protection Agency's river mile (RM) designation, assigned in 0.1-mile increments along named streams. The measurements start at the mouth of a river or stream with RM 0.0 and increase as one moves upstream. The downstream end of the Paint Creek reach proposed for designation occurs at RM 3.9 and continues upstream to RM 39.2, at the tailwater of Paint Creek Lake and Dam. Other reaches included in the study are Paint Creek upstream of Paint Creek Lake, referred to hereafter as Upper Paint Creek, from RM 46.5 to RM 52.2; Rattlesnake Creek from RM 4.0 to RM 10.8; Rocky Fork Creek from RM 0.0 to RM 9.1; and North Fork Paint Creek from RM 0.0 to RM 25.3 (Table 1).

Elevation in the Paint Creek watershed ranges from a minimum elevation of 595 feet above sea level at the downstream outlet of the watershed (mouth of Paint Creek at the Scioto River) to a maximum elevation of 1,350 feet along high ridges in the southeastern part of the watershed (Figure 4). The Paint Creek watershed straddles the boundary between glaciated and unglaciated portions of Ohio and as a result, has varied topography and ecology representing both conditions (Figure 4). It is characterized by generally smooth, rolling plains of low relief in the northern half of the watershed to increasingly rugged, high-relief hills in the southern half. The northern portion of the Paint Creek watershed is located in the Till Plains physiographic province and the southern portion in the Allegheny Plateau physiographic province (Fenneman, 1938). The northern Allegheny Plateau generally is considered the same as the glacial terminus, the southernmost extent of Pleistocene glaciation. However, in this part of Ohio the Allegheny Plateau is both glaciated and unglaciated. The defining characteristics of the Allegheny Plateau are its higher elevation, more rugged relief, and generally flattened hilltops; but the highlands in this part of Ohio are underlain by a thin veneer of glacial deposits overlying bedrock in the northern part of the plateau area, as well as by unglaciated bedrock in the southern plateau area (Figure 4).

The topographic change from rolling plains to rugged hills also represents a transition in ecological regions. Ecological regions, or ecoregions, reflect differences in ecosystem quality and integrity as identified through the analysis of patterns controlled by biotic and abiotic factors, including geology, physiography, vegetation, climate, soils, land use, wildlife, and hydrology (Omernik, 1987). The northern half of the Paint Creek watershed lies within the Eastern Corn Belt Plains ecoregion (Level III classification, 55) and includes portions of the Loamy, High Lime Till Plains (Level IV classification, 55b) and the Darby Plains (Level IV classification, 55e). Originally, beech forests were common on these soils; but today, they are dominated by corn, soybean, and livestock production. The southern half of the watershed lies within the Western Allegheny Plateau (Level III classification, 70), specifically the Lower Scioto Dissected Plateau (Level IV classification, 70d). Mixed oak forests and mixed mesophytic forests originally were widespread on upland areas, and bottomland was dominated by hardwood forests. Steep areas are still predominantly forested with some livestock grazing, while flatter areas are cropped (Omernik, 1987).

Table 1. *Stream reaches examined for scenic river designation, including the mainstem of Paint Creek in Ross County; Upper Paint Creek and Rattlesnake Creek, both upstream of Paint Creek Lake; Rocky Fork Creek; and North Fork Paint Creek. Measured reach length and reach length as defined by Ohio Environmental Protection Agency (EPA). RMs differ* as a result of meander cutoffs. The locations of segments are illustrated by number in Figure 1.*

Segment	Description	Reach as defined by OEPA RM	Measured Reach Length (mi)	Watershed Area at Downstream End of Reach (mi^2)	Average Stream Slope (ft/mi)
1	Paint Creek (bridge at Paint St./State Rte. 772 in Chillicothe to tailwater of the dam at Paint Creek State Park)	3.9-39.2	34.8*	1136.1	4.2
2	Upper Paint Creek (upstream of Paint Creek Lake to the Fayette County line)	46.5-52.2	5.7	295.8	9.6
3	Rattlesnake Creek (upstream of Paint Creek Lake to south of East Monroe)	4.0-10.8	6.8	251.2	9.2
4	Rocky Fork Creek (confluence with Paint Creek to Rocky Fork Dam)	0.0-9.1	9.1	144.2	11.3
5	North Fork Paint Creek (confluence with Paint Creek to Fayette County line	0.0-25.3	25.3	234.2	7.3

* The discrepency between the difference in rivermiles (i.e., 33.2 mi) and measured reach length (i.e., 34.8 mi) is a result of a meander cutoff along the Paint Creek reach between RM 22.5 and 23.3, which shortened the river by 0.5 miles.

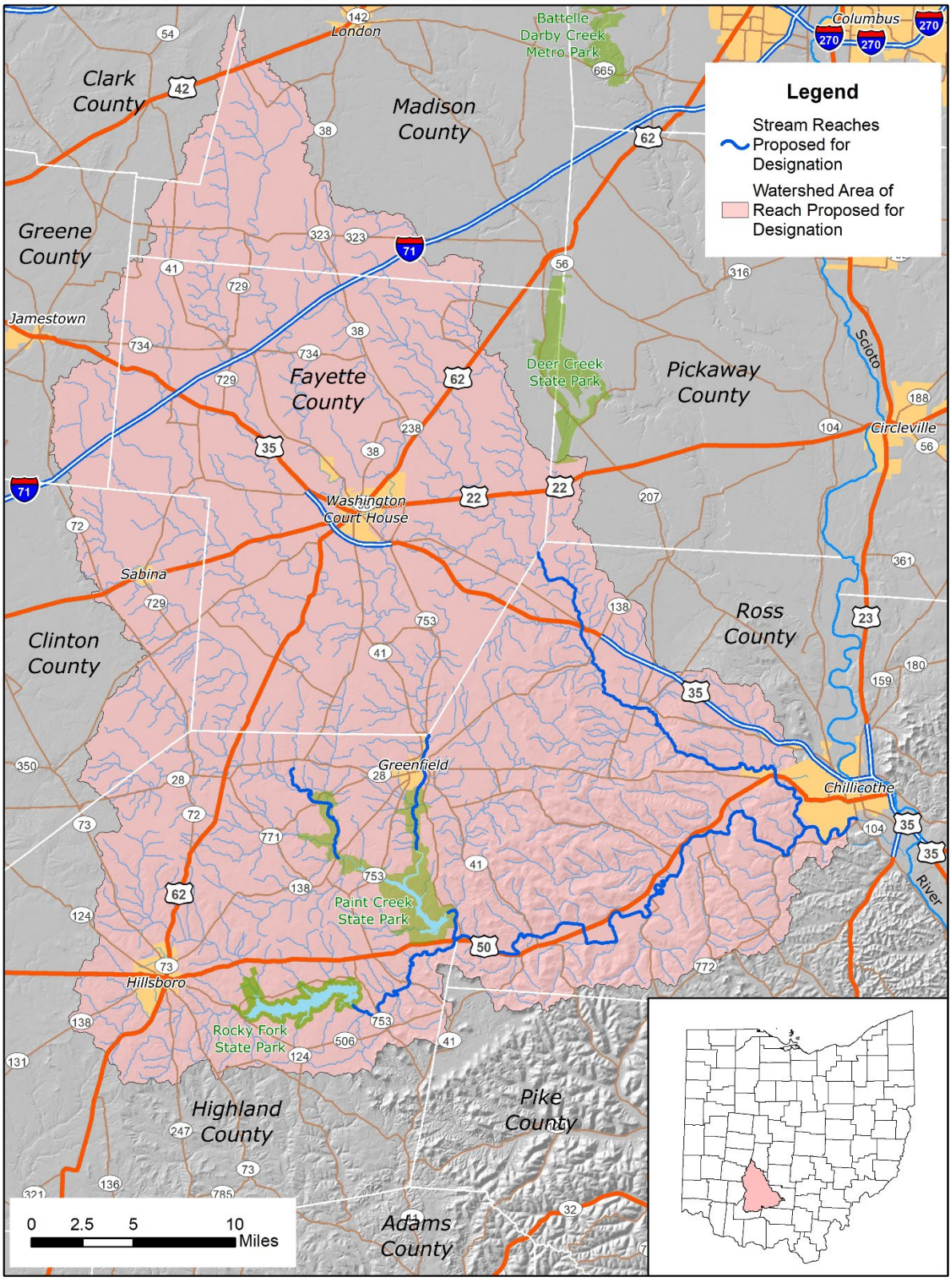

Figure 2. Location map of Paint Creek and its watershed relative to major highways, state parks, and urban areas.

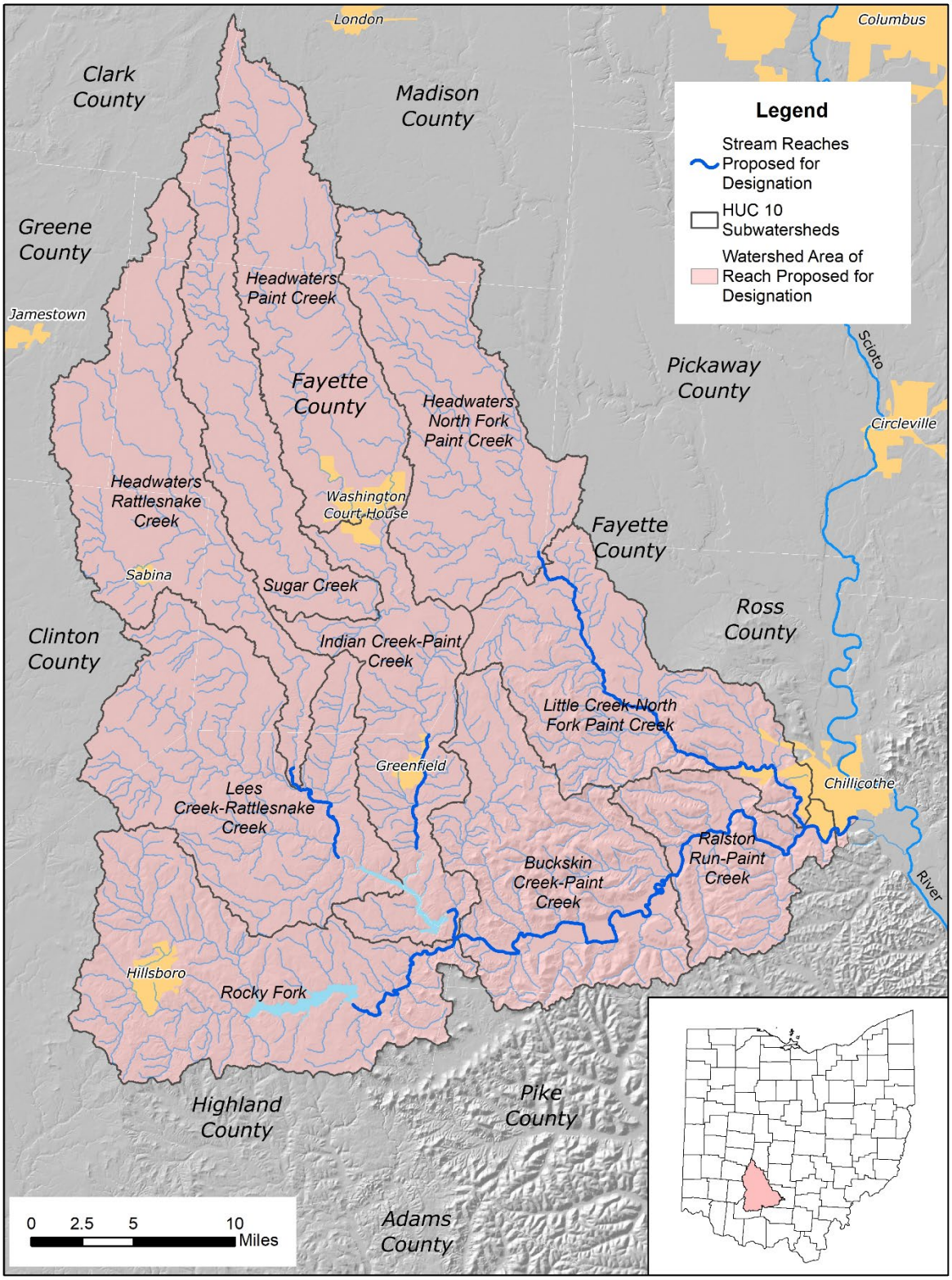

Figure 3. Subwatersheds of the Paint Creek (HUC 05060003) watershed at the 10-digit HUC level. HUC numbers and subwatershed characteristics are included in Table 2.

Table 2. *Subwatersheds of the Paint Creek watershed (HUC 05060003) at the 10-digit HUC level.*

Subwatershed Name	**HUC-10 Code**	**Area (ac)**	**Area (mi²)**
Headwaters Paint Creek	0506000301	76574.4	119.7
Sugar Creek	0506000302	52181.9	81.6
Headwaters Rattlesnake Creek	0506000303	83027.8	129.8
Lees Creek-Rattlesnake Creek	0506000304	95089.8	148.6
Rocky Fork Creek	0506000305	92375.5	144.4
Indian Creek-Paint Creek	0506000306	60646.4	94.8
Buckskin Creek-Paint Creek	0506000307	78147.0	122.1
Headwaters North Fork Paint Creek	0506000308	77148.8	120.6
Little Creek-North Fork Paint Creek	0506000309	72995.5	114.1
Ralston Run-Paint Creek	0506000310	42314.8	66.1

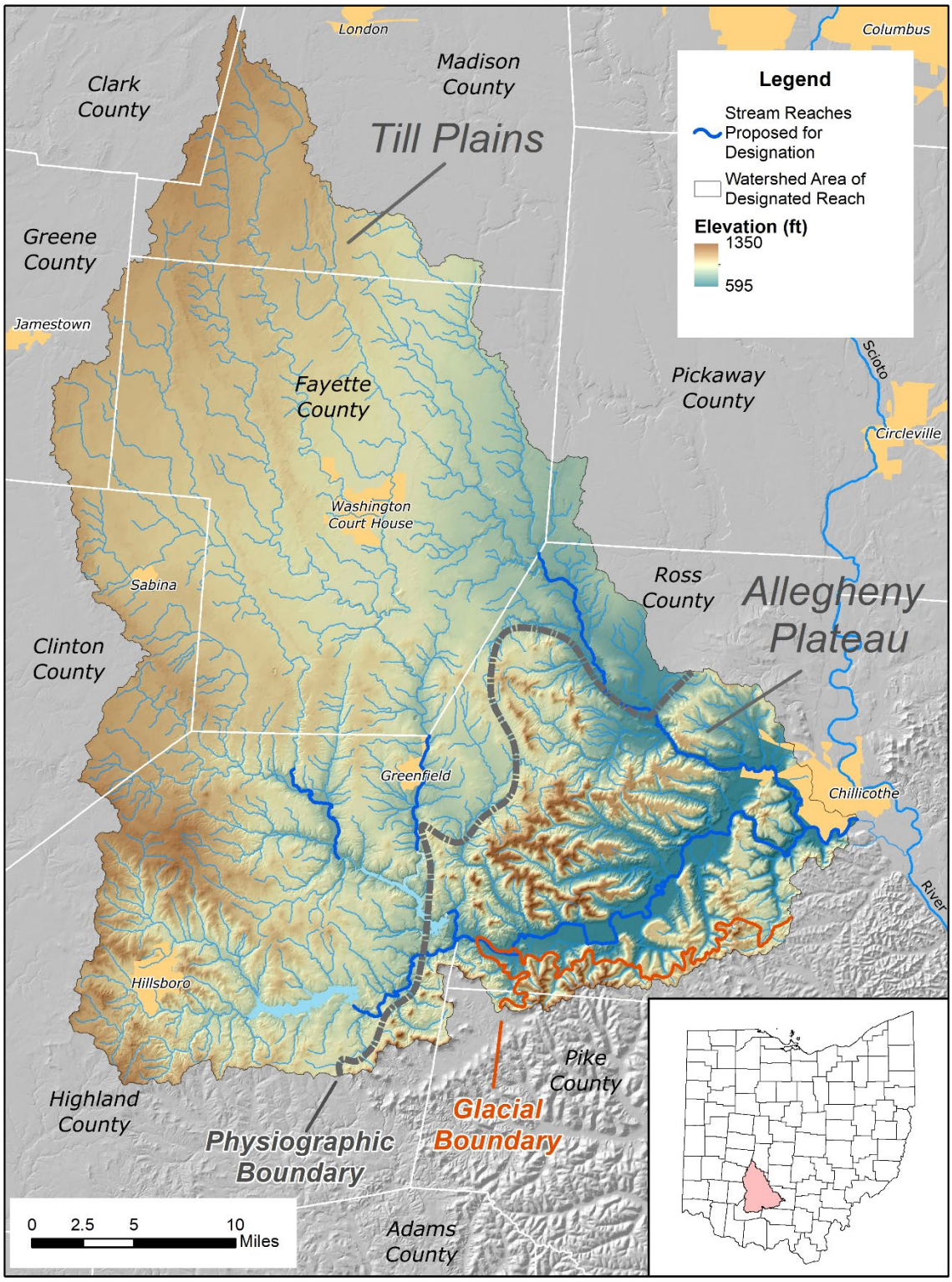

Figure 4. Shaded relief map of the Paint Creek watershed illustrating variation in elevation and relief. The northern half of the watershed is characterized by generally smooth, rolling plains of low relief; the southern half of the watershed is increasingly rugged, with higher relief hills.

Cultural History of the Paint Creek Watershed

Few areas in the United States are as rich in prehistoric remains of early civilization as the river valleys of southern Ohio (Dancey and Pacheco, 1997). Archeologists studying early civilizations define time periods as being from the common era (CE) or from before the common era (BCE). BCE is synonomous with "before Christ" (BC). Ohio has a greater variety and number of earthworks and burial mounds of the Woodland Period (800 BCE-1200 CE) than any other state (Gordon, 2008). The Woodland Period includes the Adena culture (800 BCE-100 CE), the Hopewell culture (100 BCE-400 CE), and the Fort Ancient culture (1000-1650 CE). Anthropologists consider the Hopewell culture in Ohio to be the classic expression of Middle Woodland Period in North America (Byers, 2004). Earthworks and burial mounds of this period are located in the Great and Little Miami, Muskingum, and Scioto River valleys; but they are especially concentrated in Ross County and the valleys of the Scioto River and its tributaries Paint Creek and North Fork Paint Creek (Figure 5). Although artifacts of the Paleoindian (13000-7000 BCE) and Archaic (8000-500 BCE) Periods are found in the Paint Creek watershed (e.g., during construction of Paint Creek Lake Dam, USACE, 1973), the elaborate earthworks and burial mounds constructed by inhabitants during the Woodland Period are among the most significant and celebrated cultural features of the region and state. At least eleven burial mounds or earthworks are located along Paint Creek and North Fork Paint Creek (Table 3 and Figure 5).

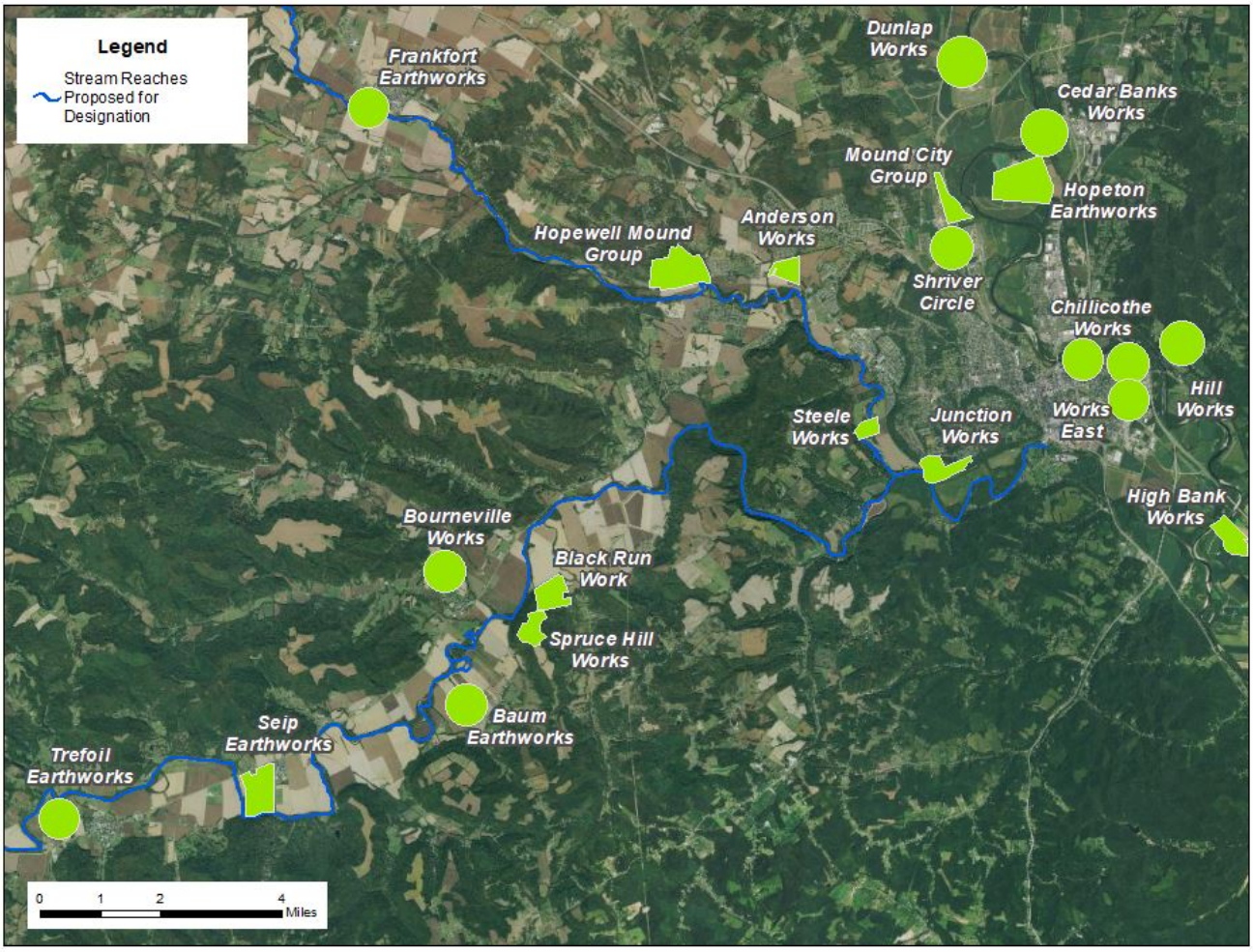

Figure 5. Ancient earthworks in the Scioto River, Paint Creek, and North Fork Paint Creek valleys located in Ross County. Sites shown with a circular boundary are on multiple properties that are privately held. The irregular boundaries represent the shapes of parcels on which earthworks were located, preserved, or restored and are protected by either the National Park Service or Arc of Appalachia (as part of the Highlands Nature Sanctuary).

Table 3. *Hopewell culture ceremonial earthworks and burial mounds located along Paint Creek and North Fork Paint Creek in Ross County, Ohio.*

River Valley	Approx. Location RM	Name	Ownership
Paint Creek	7.5	Junction Earthworks	Highlands Nature Sanctuary
Paint Creek	18.6	Black Run Stone Work	Highlands Nature Sanctuary
Paint Creek	19.2	Spruce Hill Earthworks[1]	Highlands Nature Sanctuary, managed by National Park Service
Paint Creek	19.7	Bourneville Works	Multiple Private
Paint Creek	21.4	Baum Earthworks	Multiple Private
Paint Creek	27.8	Seip Earthworks[1]	National Park Service
Paint Creek	32.2	Trefoil Earthworks	Multiple Private
North Fork Paint Creek	1.1	Steel Earthworks	Highlands Nature Sanctuary
North Fork Paint Creek	4.5	Anderson Works	Multiple Private
North Fork Paint Creek	6.7	Hopewell Mound Group[1]	National Park Service
North Fork Paint Creek	14.7	Frankfort Earthworks	Multiple Private and Archaeological Conservancy

[1] Included in the Hopewell Ceremonial Earthworks nomination for inclusion as a United Nations Educational, Scientific and Cultural Organization (UNESCO) World Heritage Site.

Five Hopewell sites within the Paint Creek watershed have been fully protected (Table 3). The National Park Service's Hopewell Culture National Historical Park manages and protects six earthworks complexes, including three in the Paint Creek watershed. The complexes include the Hopewell Mound Group, Seip Earthworks, and Spruce Hill Earthworks the latter of which is owned by Highlands Nature Sancturary (NPS, 2018) (Table 3). The Hopewell Culture National Historical Park is nominated as part of the Hopewell Ceremonial Earthworks for inclusion as a United Nations Educational Scientific and Cultural Organization (UNESCO) World Heritage Site for the upcoming 2022 World Heritage Convention. According to World Heritage Ohio, the World Heritage "criteria for cultural sites include the clear manifestations of 'outstanding universal value' and 'human creative genius'. Ohio's Hopewell earthworks are the pre-eminent examples, and the largest concentration in the world, of prehistoric monumental landscape architecture" (World Heritage Ohio, 2018). Two additional earthworks in the watershed, Junction Earthworks and Steel Earthworks, have been protected by Arc of Appalachia as part of the Highlands Nature Sanctuary (Arc of Appalachia, 2018). Both sites are smaller and simpler than other works in the watershed, suggesting that they represent a transitional phase between Adena and Hopewell cultures (Arc of Appalachia, 2018). Five of these earthworks are accessible along the banks or within a short hike from Paint Creek or North Fork Paint Creek (Table 3).

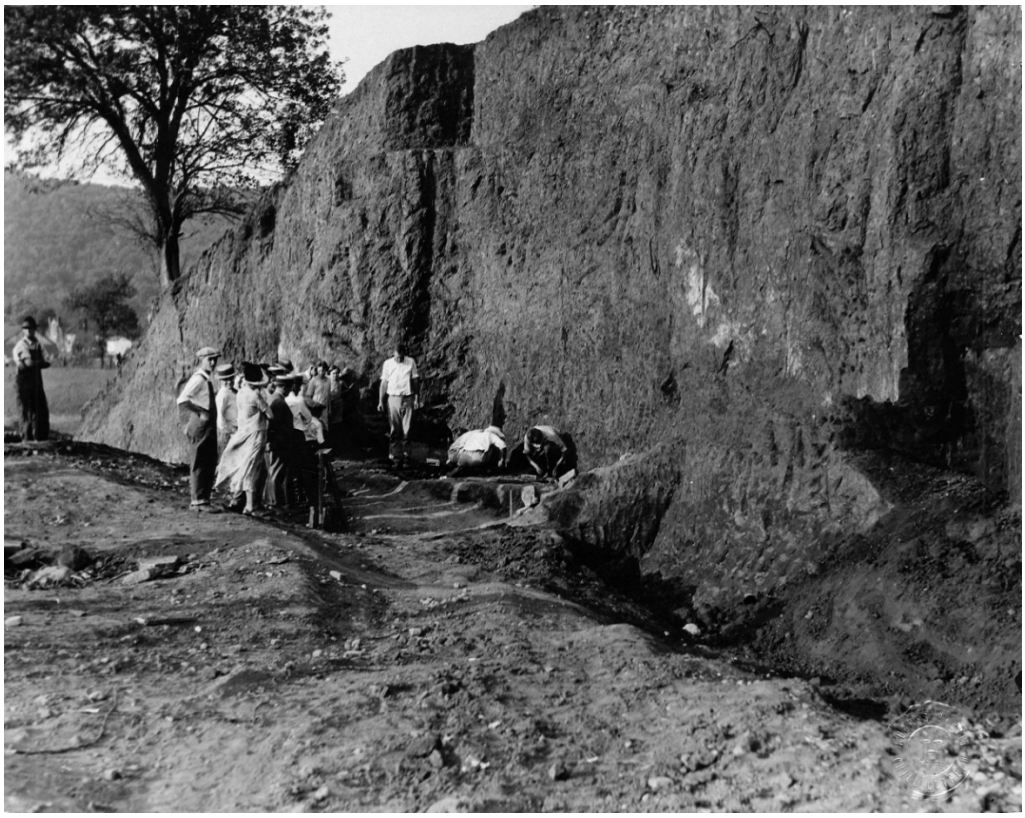

Figure 6. Archeological investigation of Pricer Mound, the principal mound of the Seip Earthworks in 1925. Photo courtesy of the Ross County Historical Society.

Figure 7. Pricer Mound, the principal mound of the Seip Earthworks, in 2018. View is to the southwest, towards Paint Creek at RM 28.2.

More recently, the Paint Creek watershed was occupied by historic Native Americans, principally from the Delaware tribe. Paint Creek derives its name from the Delaware and Shawnee tribes. It was called *olomoni siipunk* by the Delaware and *holomoonnii thiipii'chki* by the Shawnee. Both names literally mean "face-paint creek" for the iron-oxide deposits that the tribes used for face paint (Mahr, 1957). At numerous sites along Paint Creek and North Fork Paint Creek, springs flowing from sulfur-rich shale deposits precipitate the mineral limonite, an oxidized iron that, with clay, produces ocher (Hyde, 1921). The ocher was likely used as face paint by historic Native Americans for ceromonies and for war but also to dye fabric and pottery.

The Shawnee lived in the Ohio River Valley and its tributaries as early as the late 1600s, and the area of the Paint Creek watershed was considered largely Shawnee land at the end of the Northwest Indian War (1785-1795; Figure 8; Ohio History Connection, 2018). Chalahgawtha, or more commonly known by its English name Chillicothe, was the name of one of the Shawnee divisions or clans. By tradition, the home of the leader of the Chillicothe division was known as Chillicothe, so the name Chillicothe was applied to as many as five different locations during the time the Shawnee lived in Ohio. One of these locations, where present-day Frankfort is located, was in the Paint Creek watershed (Ohio History Connection, 2018). The last skirmish with Native Americans occurred in 1793 at Reeves Crossing, approximately two miles east of Bainbridge near where U.S. Route 50 crosses Paint Creek, and involved Simon Kenton, famed frontiersman in Ohio (Williams Brothers, 1880).

Settlement of the area occurred after the defeat of Native Americans at the Battle of Fallen Timbers in 1794 and the signing of the Treaty of Greenville in that same year. Nathanial Massie founded present-day Chillicothe in 1796 near the confluence of Paint Creek and the Scioto River on land granted to him as part of the Virgnia Military District (Figure 8). The Virginia Military District was an approximately 4.2-million-acre (17,000-km^2) area of land, then in the Northwest Territory, that was reserved by Virginia to use as payment in lieu of cash for its veterans of the American Revolutionary War. Ross County was formed in 1798 as the sixth county in the Northwest Territory. Other counties in the Paint Creek watershed were established at the time Ohio was granted statehood in 1803 or later (Figure 8).

Today, Chillicothe is the largest city in the watershed (estimated 2017 population 21,499 by U.S. Census Bureau), bounded on the west by North Fork Paint Creek, on the south by Paint Creek, and on the east and northeast by the Scioto River. Other prinicipal cities include Washington Court House (estimated 2017 population 14,215) in Fayette County; Greenfield (estimated 2017 population 4,555) in Highland and Ross counties along Upper Paint Creek, upstream of Paint Creek Lake; and Hillsboro (estimated 2017 population 6,512) in Highland County along Rocky Fork Creek, upstream of Rocky Fork Lake (Figure 2). These cities are situated along the principal drainages of Paint Creek, North Fork Paint Creek, and Rocky Fork Creek, each of which was used as a source of power for milling grain and sawing wood (Figure 9). These watershed areas are now dominated by cultivated crops, pasture, hay, and forest. Industry was concentrated in the cities, and the paper industry was prominent in Chillicothe, certainly taking advantage of nearby rugged, forested hillslopes that were not cleared for farming. Fertile soils on flatter surfaces in the stream valleys were cleared for farming. Aside from the fact that farms are larger than they were at the time of settlement, it is not difficult to imagine that dominant land use has not changed in the watershed since settlement.

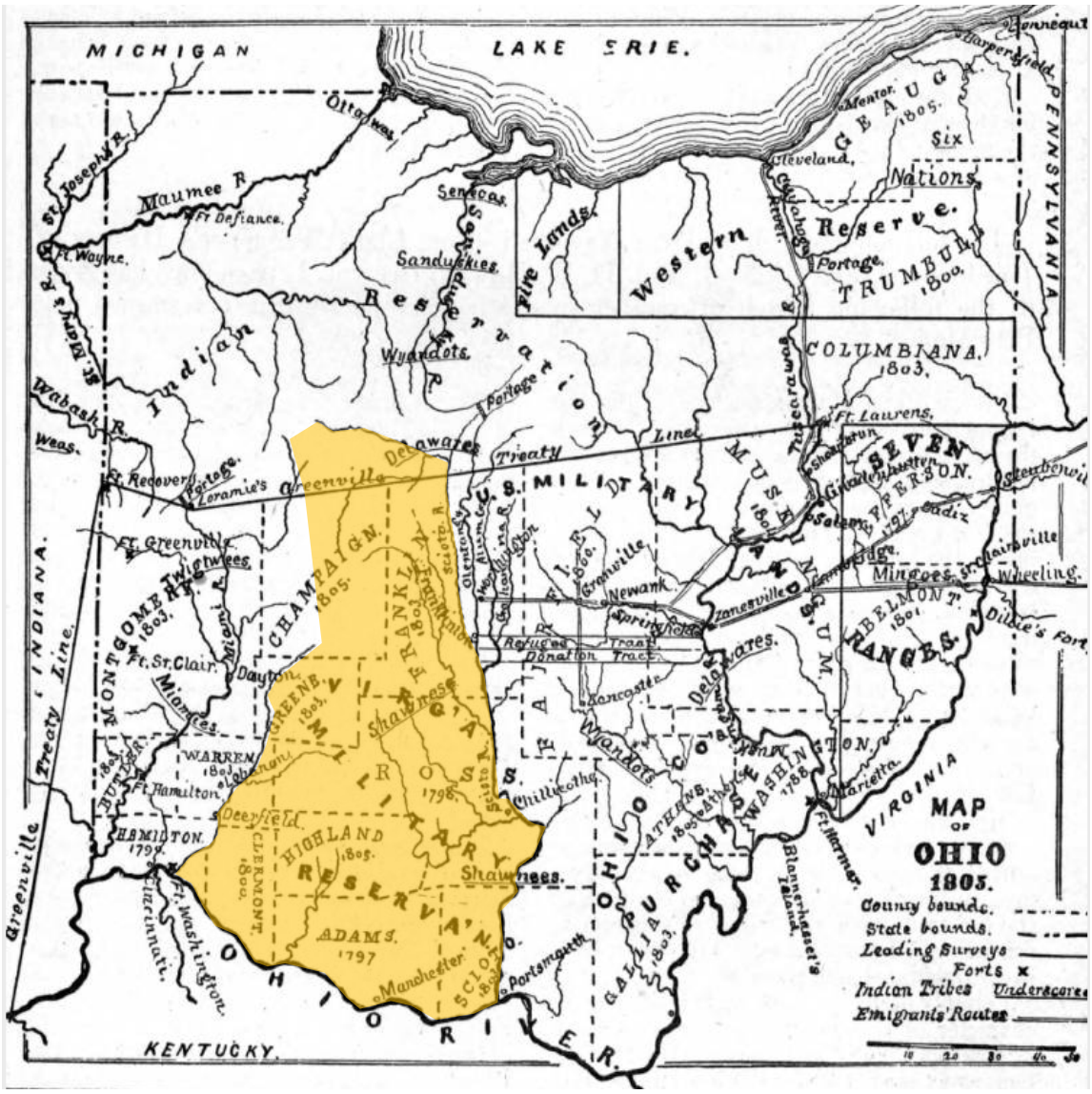

Figure 8. Map of Ohio in 1805, shortly after statehood was granted in 1803, showing state and county boundaries at the time, locations of areas formerly occupied by historic Native American tribes, and principal rivers (modified from Henry Howe's "Historical Collections of Ohio," 1907). The Paint Creek watershed is located in the Virginia Military District (in yellow). The Virginia Military District was bounded by the Little Miami River on the west and the Scioto River to the east.

Figure 9. McCoppin Mill, which included both a sawmill and gristmill, on Rocky Fork Creek, just downstream of Rocky Fork Dam and Lake. Photo courtesy of the Ross County Historical Society.

Land Use

Land use and land cover change have the most pervasive impact on watershed hydrology and ultimately, overall stream condition. Although Native American Indians cleared large tracts of land for agriculture, at the time of settlement, the Paint Creek watershed was still predominantly forested. The natural vegetation in the watershed at that time was diverse, dependent on soils and drainage. Beech forests dominated sandy soils, especially in the upper, flatter parts of the Rocky Fork Creek subwatershed with wet beech downstream in valleys (Gordon, 1966). Mixed oak forests dominated uplands in the headwaters of Paint Creek and North Fork Paint Creek with elm-ash swamp forests in the valley bottoms. Mixed mesophytic forests occupied deeper, older soils in downstream areas of the watershed (Gordon, 1966).

Current land use is predominantly agricultural in the low relief part of the watershed to the north and deciduous forest in the high-relief areas in the southern part (Figure 10). Cultivated crops account for 59.3% of the land cover in the watershed, and deciduous forest covers 20.0% of the watershed (Table 4). Hay and pasture is subdominant, located preferentially along drainages and covering 10.1% of the watershed (Figure 10 and Table 4). Combined, these three land covers account for 90% of the total watershed area. Most of the remaining land cover is developed open space and water (4.7%), much of it associated with national, state, and county parks.

Less than 3% of the watershed is comprised of low-, medium-, and high-intensity developed land covers associated with urban and suburban residential, commercial, and industrial land uses (Table 4). Impervious surfaces in these areas are an important barometer of environmental health of watersheds and streams. Urban impervious surfaces, such as roof tops, parking lots, sidewalks, and roadways, do not allow water to infiltrate into the soil as do natural land cover, such as forests or wetlands, hay and pasture, and even cultivated crops. This increases the amount of water that runs off the land, thereby increasing flooding and stream channel instability. Increased runoff is also associated with a

variety of various contaminants, such as metals, nutrients, sediments, pathogens, and debris, associated with impervious land use. Reduced infiltration caused by imperviousness also decreases the rate of groundwater recharge, which can negatively affect streamflow particularly during the dry season. Ultimately this can result in increased fluctuations in streamflow, with higher flows during the wet season and lower flows during the dry season. This altered flow regime negatively impacts water quality and biological diversity. In Paint Creek watershed, the largest concentration of impervious cover is Chillicothe, part of which is in the Paint Creek watershed near the outlet. The second largest concentration of developed land is associated with Washington Court House in the Headwaters Paint Creek subwatershed (Figure 10).

The amount of low-, medium-, and high-intensity developed land cover in the Paint Creek watershed (2.2%), not all of which is composed of impervious surface, is well below the threshold generally considered to impact (10-30%) and degrade (greater than 30%) the stream health of a watershed (Arnold and Gibbons, 1996). In an assessment of Ohio streams, Miltner et al. (2004) determined that stream health, as determined by the Index of Biotic Integrity (IBI), declined significantly when impervious area exceeded approximately 14% of the watershed area, and fell below expectations consistent with Clean Water Act goals when impervious area exceeded 27%. In addition, Arnold and Gibbons (1996) consider stream health to be protected when impervious surfaces account for less than 10% of the watershed area. Paint Creek watershed falls well within these limits.

Table 4. *Land cover data for 2011 in the Paint Creek watershed. The area of the Paint Creek watershed is defined by an outlet at RM 3.9 on Paint Creek, which is upstream of its confluence with Scioto River, but defines the lower end of the watershed examined for designation.*

Land Cover	Area (mi^2)	%
Open Water	7.0	0.6
Developed, Open Space	46.8	4.1
Developed, Low Intensity	18.0	1.6
Developed, Medium Intensity	4.6	0.4
Developed, High Intensity	2.0	0.2
Barren Land	0.8	0.1
Deciduous Forest	226.8	20
Evergreen Forest	3.1	0.3
Mixed Forest	7.3	0.6
Shrub/Scrub	7.7	0.7
Grassland, Herbaceous	23.3	2.0
Hay, Pasture	114.4	10.1
Cultivated Crops	674.0	59.3
Woody Wetlands	0.2	0.0
Herbaceous Wetlands	0.3	0.0

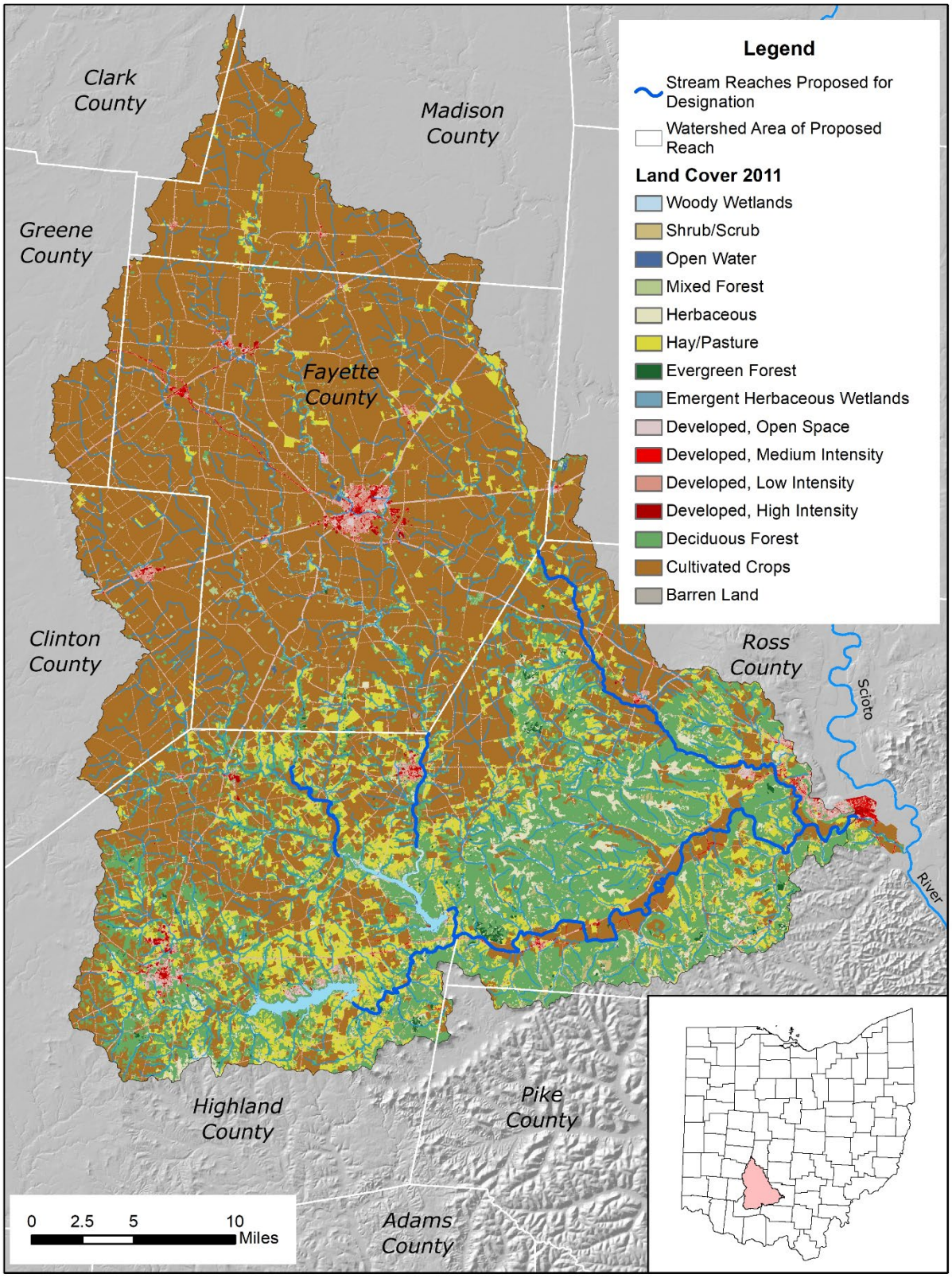

Figure 10. Land cover in the Paint Creek watershed based on data from the National Land Cover Database for 2011.

Recreational Opportunities

Today, Paint Creek and Upper Paint Creek, and its tributaries Rattlesnake Creek, Rocky Fork Creek, and North Fork Paint Creek, are used used for recreation, including canoeing, kayaking, and fishing. Three canoe liveries currently operate on Paint Creek:

- Paint Creek Rental (14000 U.S. Route 50 Chillicothe, Ohio 45601)
- Waters Edge Canoe Livery (10807 State Route 772 Chillicothe, Ohio 45601)
- Shawnee Valley Campground (307 Alum Cliff Road Chillicothe, Ohio 45601)

(a) (b)

Figure 11. Recreation on Paint Creek in the past near Copperas Mountain (a) and today in The Narrows (b). Figure 11a is courtesy of the Ross County Historical Society.

In addition, there are several annual activities that utilize or focus on Paint Creek and its tributaries. The Paddle on Paint Creekfest is an annual community event hosted by Grow Greater Greenfield (G3), a nonprofit organization devoted to improving the quality of life in the Greenfield area (Grow Greater Greenfield, 2018). Waters Edge Canoe Livery provides kayak and canoe rentals and equipment. The event includes three- to nine-mile kayaking and canoeing trips on Paint Creek, beginning upstream of the City of Greenfield and ending at Felson Park in Greenfield. The purpose of this event is to involve the Greenfield community in recreation by exposing residents to this nearby waterway. Paint the Creek was an annual six-mile kayak float down Paint Creek organized by Southern Ohio Survivors, an organization dedicated to supporting and creating awareness for cancer survivors in the area. Waters Edge Canoe Livery donates kayaks and labor for the event, but all proceeds go to the support of Southern Ohio Survivors. Paddle for Post Traumatic Stress Disorder (PTSD) is an event hosted by Project Badass, a nonprofit organization, which promotes knowledge of outdoor recreational activities to service men and women suffering from PTSD (Project Badass, 2018). Kayak rentals are through Shawnee Valley Campground, which donates part of the rental proceeds to the Ohio chapter of Disabled American Veterans.

Significant off-stream recreational amenities and opportunities exist within the watershed (Figure 12). Four of the five protected Hopewell sites within the Paint Creek watershed are open to the public either daily or by permit. The Hopewell Culture National Historical Park includes two sites in the Paint Creek watershed, the Hopewell Mound Group along the banks of North Fork Paint Creek and Seip Earthworks along the banks of Paint Creek. Junction Earthworks, managed by Arc of Appalachia, is at the junction of Paint Creek and North Fork Paint Creek. The latter two sites are accessible from Paint Creek. Spruce Hill Earthworks is offstream and accessible by permit through the National Park Service. Steel Earthworks, managed by Arc of Appalachia, is open to the public and accessible from North Fork Paint Creek.

The Ross County Park District has several parks and a trail located immediately adjacent to Paint Creek and North Fork Paint Creek (Figure 12). Earl H. Barnhart "Buzzard's Roost" Nature Preserve is the most expansive, comprising 1,200 acres of forested upland, hillslope, and stream valley and extending from Paint Creek to North Fork Paint Creek near the confluence. The area of Buzzard's Roost along Paint Creek includes most of the valley referred to as the "narrows" locally, and the extensive trail system includes several valley-wide views of Paint Creek from the upland (Figure 12). Maple Grove Prairie, planted in native grasses and wildflowers, is a 99-acre parcel that borders the North Fork of Paint Creek. The Paint Creek Recreational Trail runs through this prairie and alongside Hopewell Mound Group, crossing over North Fork Paint Creek multiple times between Chillicothe and Frankfort (Figure 12). The Donald F.Coppel Athletic Complex is a 43-acre site dedicated to community soccer fields; it lies along the banks of North Fork Paint Creek.

Two reservoirs and their associated state parks, Paint Creek Lake and State Park and Rocky Fork Lake and State Park, are also located within the watershed (Figure 2). Construction of the Paint Creek Dam by the U.S. Army Corps of Engineers (USACE) was completed in 1974. It was constructed following widespread flooding in Ohio in 1959 to provide flood control within the Scioto River watershed. Outflow from Paint Creek Lake is managed by the USACE Huntington District. If affects downstream flow on Paint Creek following significant rainfall events, as is discussed later in this report. Rocky Fork Lake was constructed in 1951 by the Ohio Department of Natural Resources for recreational purposes. This dam is located upstream of the lowhead dam associated with the historic McCoppins Mill site (Figure 9) and is a run-of-river type of dam, designed to increase water level behind the dam for hydropower or, in this case, recreation. The Rocky Fork dam has negligible control on downstream flow.

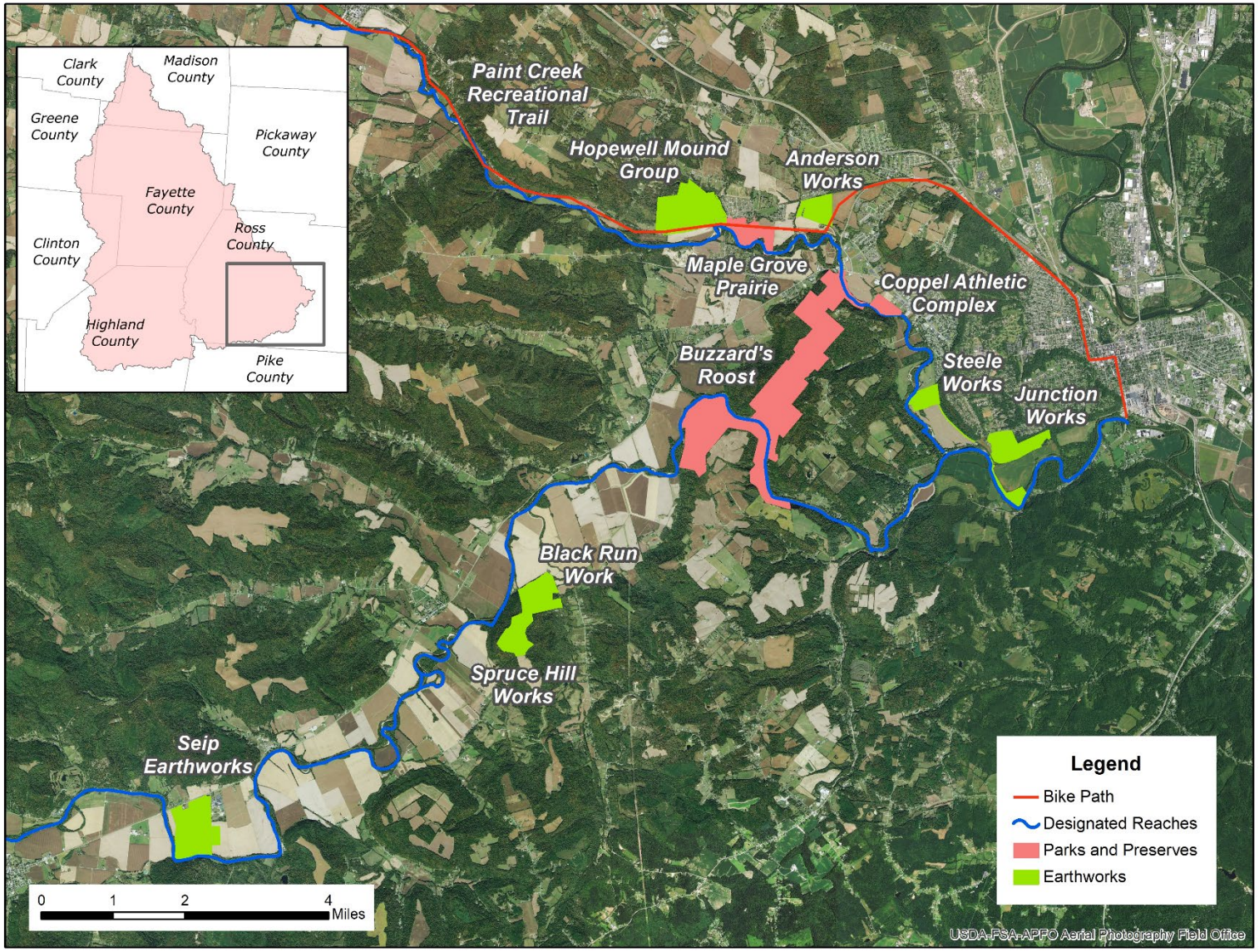

Figure 12. Cultural and recreational sites on or immediately adjacent Paint Creek and North Fork Paint Creek. Additional recreational areas (not shown on map) are located upstream, including Paint Creek and Rocky Fork State Parks and the Paint Creek Lake Wildlife Area. The rectangle in the inset map shows the location of the mapped area within the Paint Creek Watershed.

Abiotic and Biotic Features

Bedrock Geology

Bedrock geology plays a critical role in the most impressive vistas both of Paint Creek and from Paint Creek. The Paint Creek watershed is underlain by Ordovician-age and Silurian-age limestone, dolomite, and shale in the western and northern part of the watershed and Upper Devonian-age to Lower Mississippian-age shale and sandstone in the southeastern part (Figures 13-15). During the Ordovician (485-444 million years ago [mya]) and Silurian (444-419 mya) Periods, Ohio was covered by intermittent shallow, warm seas (Figure 16). Limestone and dolomite were deposited in the deeper marine environments, including carbonate banks and reefs, and shales in shallower water and emergent low mudflats, including lagoons and bars. Marine seas were deep enough at times to support reefs, evident from the fossiliferous limestones and dolomites representing this time. Bedrock outcrops of this age are especially well exposed in the Upper Paint Creek watershed because dolomites of the Peebles Formation are both massive-bedded and resistant (Figure 13).

Shale and sandstone deposited in the Devonian (419-359 mya) and Mississippian (359-323 mya) Periods represent the transition from shallow, noncirculating seas and mudflats to dry land dominated by stream and delta silts and sands (Figure 16). Outcrops of shale, sandstone, and interbedded shale and sandstone are especially prominant downstream where Paint Creek or North Fork Paint Creek are in contact with the Ohio Shale and younger units (Figures 14 and 15). Younger and higher units, including the Berea Sandstone, the Buena Vista Member of the Cuyahoga Formation, and sandstone interbeds in the Cuyahoga Formation, serve as caprock, protecting less-resistant shale below (Figure 14).

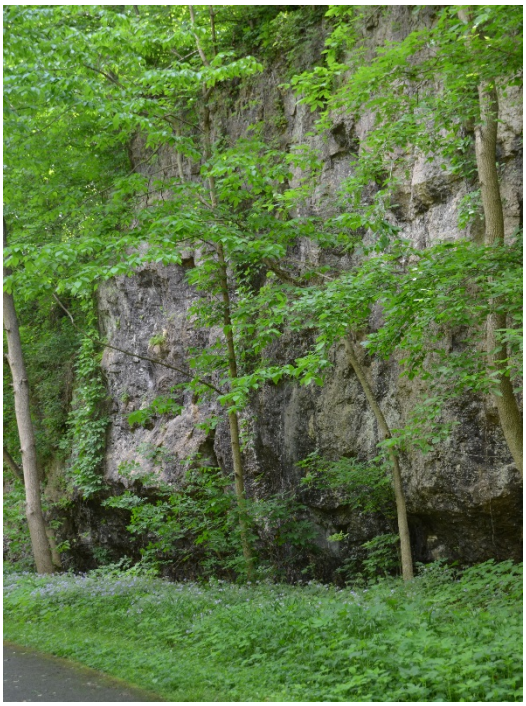

Figure 13. Cliff face formed where massive dolomite overlies thinly bedded dolomite. Outcrop is along the Paint Creek valley wall near the outlet for Paint Creek Lake, and the unit is mapped by Slucher and others (2006) as Peebles Dolomite, Lilley and Bisher Formations, Undivided of Silurian age.

Figure 14. Cliff face formed where sandstones overlie interbedded shale and sandstone. Outcrop is along Paint Creek in Buzzard's Roost Nature Preserve, and the unit is mapped by Slucher and others (2006) as Logan and Cuyahoga Formations Undivided of Lower Mississippian age.

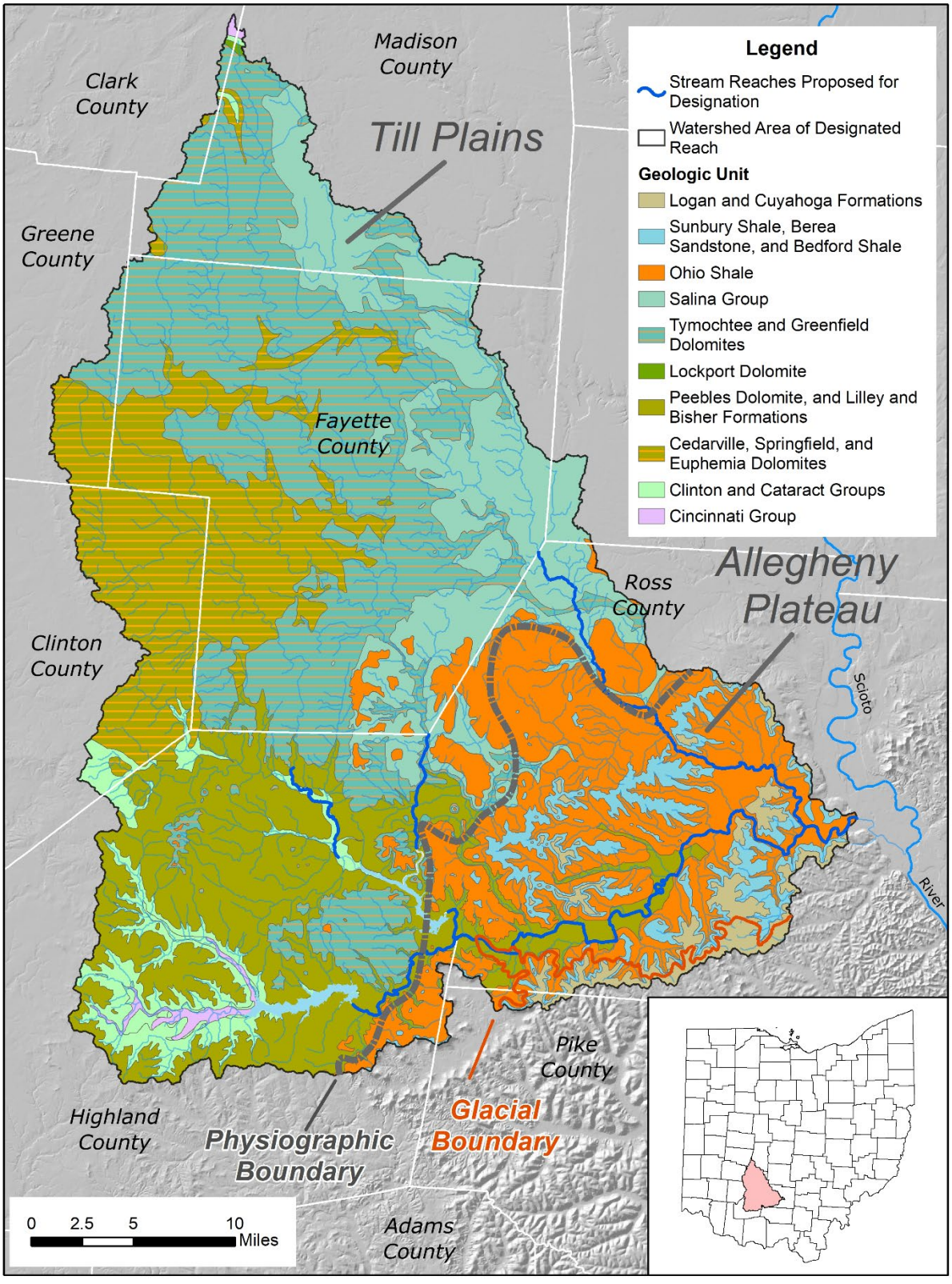

Figure 15. Bedrock geology of the Paint Creek watershed as mapped by Slucher et al. (2006).

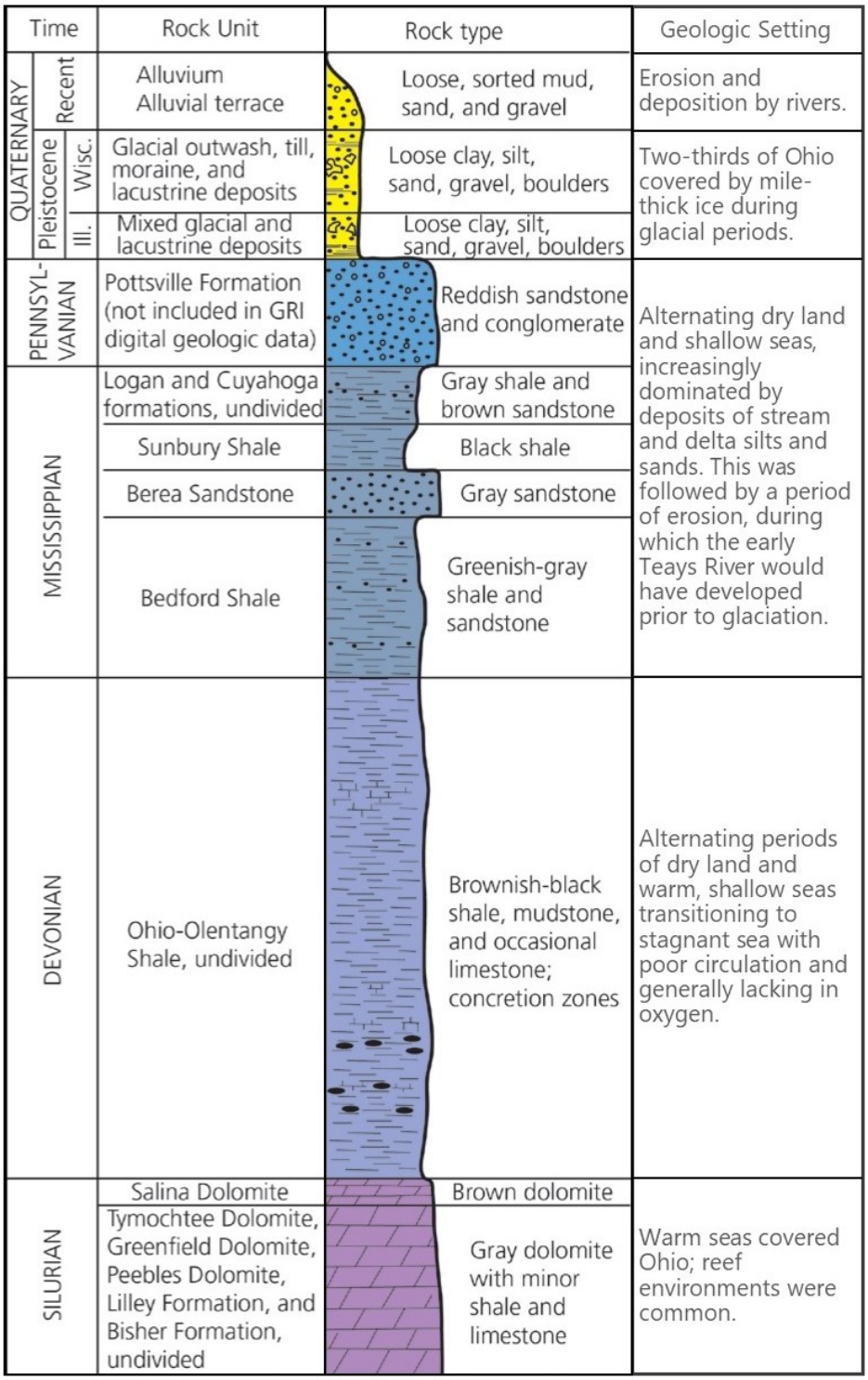

Figure 16. Generalized stratigraphic column for Ross County and the Paint Creek watershed (modified from Thornberry-Ehrlich, 2013, and ODNR Division of Geological Survey, 2001).

Areas in Ohio featuring exposed bedrock provide a contrast in the natural landscape that we value. This is evident in the lands we protect or promote (e.g., Old Man's Cave and Cedar Falls in Hocking Hills State Park or State Nature Preserves like Blackhand Gorge, Conkles Hollow, Christmas Rocks, and Clifton Gorge). Paint Creek watershed is exceptional in this regard, as bedrock exposures produced by Paint Creek and its tributaries provide not only vistas of the streamscape but vantage points from which it is viewed.

Where Paint Creek and its tributaries erode through resistant beds of dolomite or sandstone, gorges or narrows characterize their valleys, and bedrock channels may contain whitewater, cascades, and falls. Rocky Fork Creek downstream of Rocky Fork Lake and Paint Creek downstream of Paint Creek Lake expose resistant dolomites of the Peebles Dolomite and Lilley and Bisher Formations (Figure 15; Slucher et al., 2006). Vertical cliffs as much as 100 feet above the streambed are especially well-exposed along reaches of Rocky Fork Creek in Rocky Fork Gorge State Nature Preserve and Miller Sanctuary State Nature Preserve. These state nature preserves are located within Highlands Nature Sanctuary, owned and managed by the Arc of Appalachia. This area was formerly known as 7 Caves, a theme park built around the caves, which developed in the soluble dolomite and limestone now dissected by Rocky Fork Creek. Similar exposures occur along Paint Creek, near the outflow (Figure 13).

Bedrock exposures resulting from vertical erosion are also present along Paint Creek just upstream of its confluence with North Fork Paint Creek in Buzzard's Roost Nature Preserve. Paint Creek flows from a broad U-shaped valley, as much as 1.5 miles across, then "abruptly turns to the right and enters a gorge 300 to 350 feet deep, the walls of which are the steepest slopes within the [area], and which is so narrow that there is not room for a road between creek and wall … The Narrows" (Hyde, 1921). The underlying geology is a thick section of Ohio Shale overlain and defended by sandstones of the Berea Sandstone and Buena Vista Member of the Cuyahoga Formation. A similar geologic section is exposed along North Fork Paint Creek in Buzzard's Roost Nature Preserve, where Paint Creek is cutting laterally into the section before it meets Paint Creek downstream. The relief created by these two erosional processes provides exceptional views of Paint Creek and the steep V-shaped valley morphology (Figure 17). Figure 18 illustrates a contrasting valley shape, the broad U-shaped valley that is more common on Paint Creek and North Fork Paint Creek, where the streams flow through glacial outwash and alluvium.

Figure 17. View of Paint Creek from caprock composed of Berea Sandstone in Buzzards Roost Nature Preserve. This location, in The Narrows, illustrates the V-shaped stream valley where Paint Creek is cutting vertically into bedrock.

Figure 18. View of Paint Creek, looking upstream from Grandview Cemetery in 1946. The view from this location illustrates the broad U-shaped stream valley where Paint Creek is cutting laterally in glacial outwash. Photo courtesty of the Ross County Historical Society.

Lateral erosion by streams is important also to the development of this landscape appeal. Its role in creating a meandering stream pattern will be addressed later; but where streams erode laterally into resistant bedrock or bedrock defended by resistant caprock, they erode steep slopes along the valley margin that are critical to maintain both vistas and vantage points. Lateral erosion in the Paint Creek watershed is most apparent where the meander of Paint Creek erodes into the Ohio Shale along Copperas Mountain, Little Copperas Mountain, and Spruce Hill (Figure 19). Though normally less resistant even than limestone and dolomite, shale overlain by sandstone is protected or defended from weathering and erosion by the sandstone caprock. The resistant sandstone in these cases is the Berea Standstone or a combination of the Berea Sandstone and the Buena Vista Member of the Cuyahoga Formation (Hyde, 1921; Thornberry-Ehrlich, 2013). Where Paint Creek erodes laterally into the easily erodible shale, the sandstone maintains sheer cliffs more than 300 feet tall and provides excellent exposure of the Ohio Shale and its characteristic iron concretions (Thornberry-Ehrlich, 2013). Rockfalls occur frequently on the steep slopes of Copperas Mountain, Little Copperas Mountain, and Spruce Hill. Concretions from the Ohio Shale weather out preferentially and are commonly found in Paint Creek near outcrops. In addition, these exposures provide significant vistas that are apparent from both the stream as well as more distant vantage points afforded by the broad floodplains of Paint Creek.

Figure 19. Exposure of Ohio Shale resulting from lateral erosion of Paint Creek into Spruce Hill (RM 19.0). The shale is not very resistant and is easily eroded by Paint Creek. An overlying resistant caprock of sandstone protects, or defends, and maintains the steepness of the outcrop.

Glacial Geology

Though exposure of bedrock is impressive along Paint Creek and its tributaries, most of the bedrock geology in the watershed is covered by glacial deposits. Glaciers covered more than 99% of the Paint Creek watershed during mulitiple glaciations from as early as 300,000 years ago to as recently as 12,000 years ago (Pavey et al., 1999). Only the extreme southwestern part of the watershed is not glaciated (Figure 20).

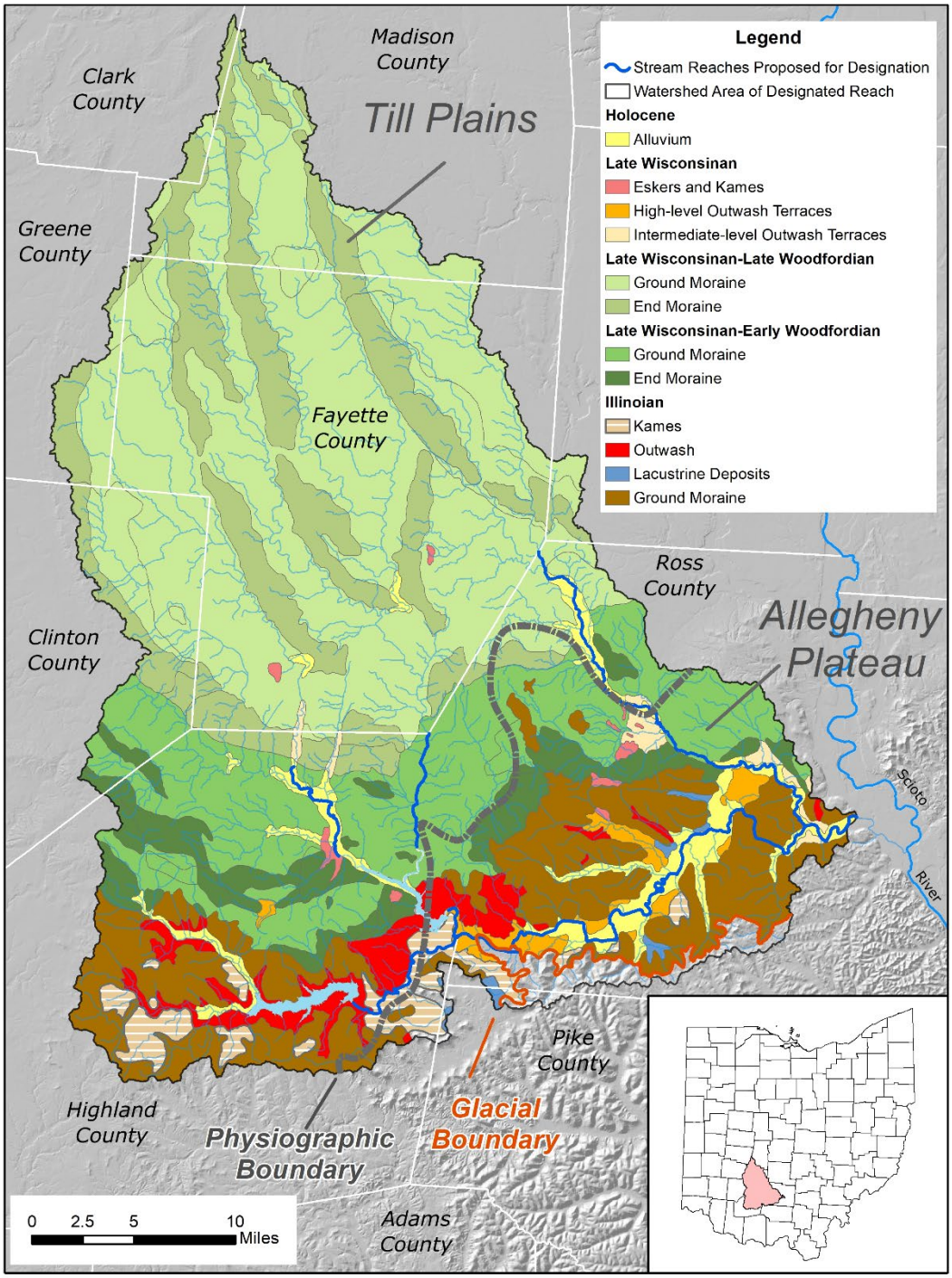

Figure 20. Glacial geology of the Paint Creek watershed as mapped by Pavey et al. (1999).

The glacial geology of the Paint Creek watershed is dominated by two different types of glacial deposits and their associated landforms:

> Till - poorly-sorted glacial deposits, including sediment sizes ranging from clay and silt to boulders and not stratified or layered. Glacial till is deposited directly by the glacier as it recedes. It underlies and comprises landforms known as *ground moraines* or *end moraines*. Ground moraines are flat, rolling plains formed when glaciers are retreating uniformly, depositing sediment as ice melts. End moraines form as accumulations of till, producing parallel low-relief ridges where the ice margin was stagnant for some period of time or where a minor readvance of the glacier pushed sediment upward.
>
> Outwash - well-sorted and stratified sands and gravels, deposited by meltwater. Where sediment is deposited from the glacier in the presence of meltwater, finer clays and silts are washed out of what essentially would have been till, leaving behind sand and gravel in layers. These deposits form outwash plains, similar in form to floodplains and river terraces.

Glacial till, ranging from less than 25 feet to more than 100 feet in thickness, covers most of the watershed (Figure 20). It was deposited during three different glacial periods (Pavey et al., 1999). The Illinoian stage of glaciation (about 300,000 to 130,000 years ago) covered most of the watershed. Tills from this time are preserved along the southern boundary of the watershed because they were not excavated or buried by subsequent glaciations. Outwash from the Illinoian glacier flowed through the present course of the Paint Creek valley, filling in its preglacial valley.

During the Late Wisconsinan stage of glaciation, the northern two-thirds of the watershed was covered by glacial till (Figure 20). This stage was comprised of two glaciations, known as Early Woodfordian (24,000 to 18,000 years ago) and Late Woodfordian (18,000 to 14,000 years ago; Pavey et al., 1999). These glaciations covered successively less of the watershed as indicated by a series of end moraines that record the retreat (Figure 20). The elongate nature of several subwatersheds and their tributaries, including Headwaters Paint Creek, Headwaters North Fork Paint Creek, Headwaters Rattlesnake Creek, and Suger Creek (Figure 3) are the result of the location of end moraines in the Upper Paint Creek watershed (Figure 20). Outwash from late Wisconsinan glacial retreat deposited sand and gravel in Upper Paint Creek, Rocky Fork Creek, Upper and Lower Twin Creek, North Fork Paint, and the mainstem of Paint Creek (Figure 20). These deposits are inset into Illinoian outwas in places along the mainstem of Paint Creek and Rocky Fork Creek.

Glaciation of the Paint Creek watershed played an important role in the evolution and path of Paint Creek and its tributaries. Prior to glaciation, Paint Creek would have been tributary to the Teays River, which flowed to the northwest (Figure 21). As Illinoian ice covered the highest points in the watershed, it would have buried and blocked the ancestral Paint Creek. This is clear from the location and elevation of Illinoian lacustrine units (Figure 20), which would have been deposited in lakes formed in impounded stream valleys along the glacial margin. Ice damming associated with early glaciation also would have caused the Teays River to flood its valley and overflow low divides and create a new course as the Ohio River (Figure 21). Following this, Paint Creek would have been tributary to the Scioto River.

Detailed glacial mapping of Ross County by Quinn and Goldthwaite (1985) suggests that damming of the ancestral Paint Creek by ice occurred as the Illinoian ice sheet retreated. This caused temporary redirection of Paint Creek across bedrock in The Narrows, along the Alum Cliffs (i.e., its current course; Figures 21 and 22). According to their mapping, with continued retreat of the Illinoian glacier, Paint Creek reoccupied its original course (i.e., the route indicated at 2 in Figure 22). Early Woodfordian ice would have blocked the northward flow of Paint Creek, again causing it to flow over bedrock through The Narrows (Figures 20 and 22). High-level outwash from this time may have plugged the northern outlet, making the change in course permanent.

One of the most impressive characteristics of Paint Creek is the contrast in valley morphology between the V-shaped valley of The Narrows and the broad, U-shaped valley upstream and downstream of The Narrows. The latter morphology dominates the system. Although they are now filled with outwash, the broader U-shaped valley likely was

much narrower but deeper, formed in bedrock, during the time of the ancestral Paint Creek when it was tributary to the Teays River (the dashed cross section in Figure 22). The reach of Paint Creek at The Narrows is now cut in bedrock; though higher in elevation, its morphology is likely similar to these early, now-buried valleys. Filling of these valleys by glacial outwash created broad, flat valley floors. Alluvium is more recent (Figure 20), the result of Paint Creek and its tributaries reworking the glacial outwash.

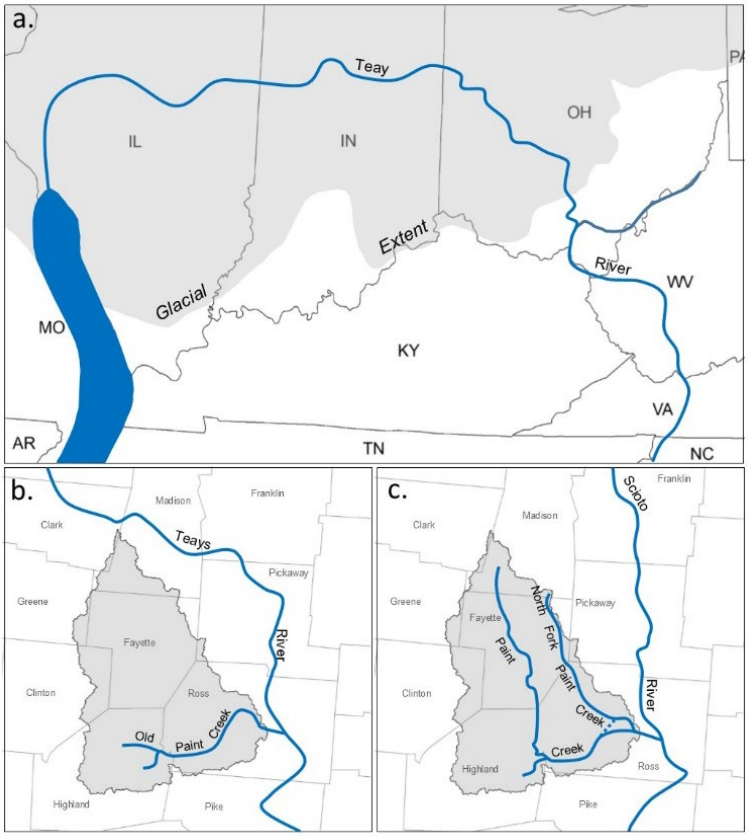

Figure 21. (a) General location of the ancient Teays River in Ohio and the Midwest (from Schumacher, 2008).

(b) Location of Old Paint Creek, a tributary of the Teays River, prior to glaciation. The watershed boundary to the north would not have existed and was covered by glacial ice several times during Pleistocene time.

(c) Following glaciation, the former path of Paint Creek (dashed line) shifted southward across The Narrows because of glacial damming.

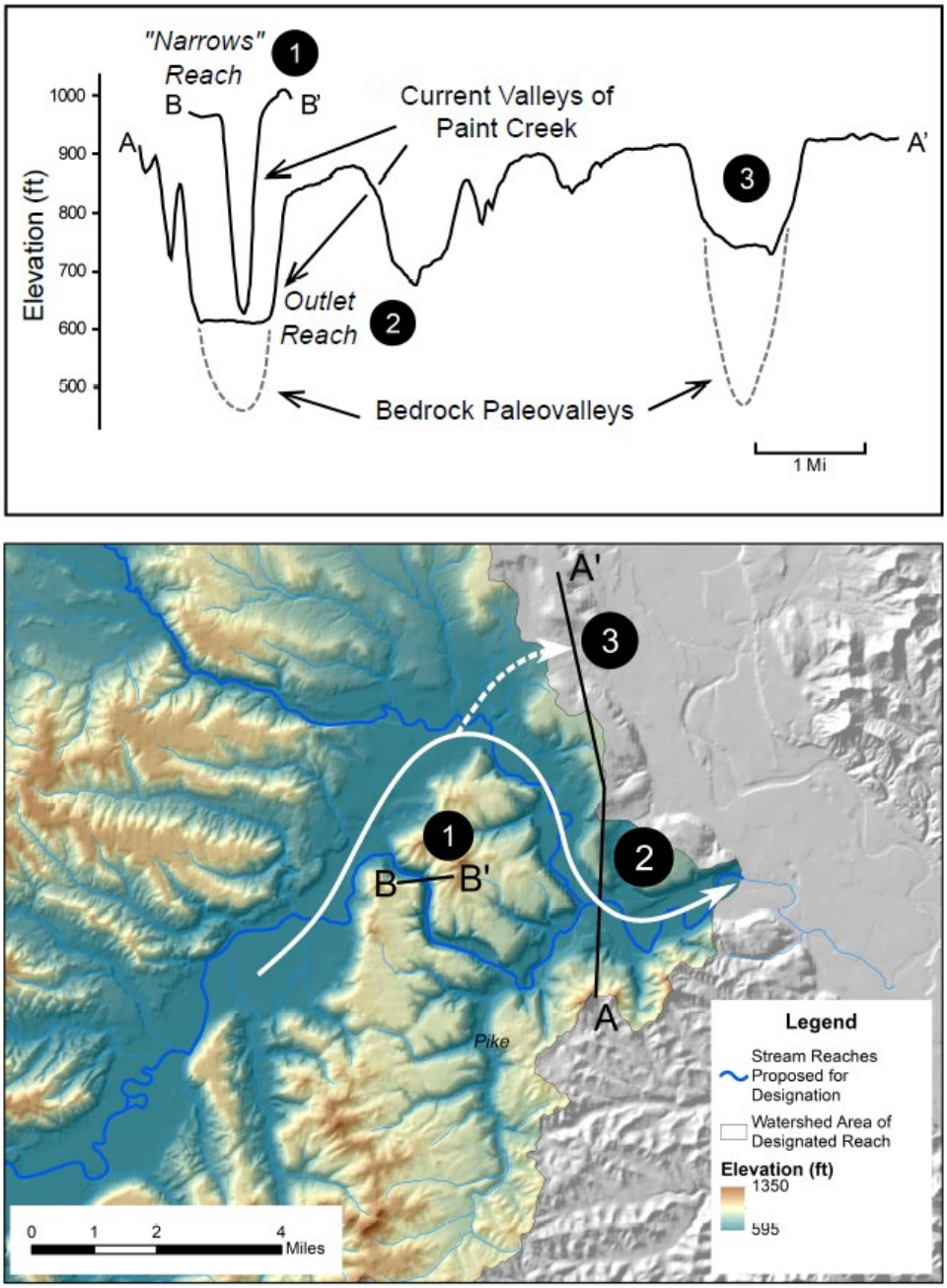

Figure 22. Topographic and paleo-topographic (i.e., the dashed bedrock surface) cross sections of the Paint Creek valley near its confluence with Scioto River valley (A-A′) and within the Narrows (B-B′). Courses of Paint Creek over time are also shown, presently (indicated by location 1) and two potential preglacial courses (2 and 3). The course indicated at 2 is the more widely accepted preglacial course of Paint Creek, but the bedrock topography suggests a potential course at location 3 as well. During preglacial time, Paint Creek would have been tributary to the Teays River.

Water Resources

The Paint Creek River watershed has a temperate continental climate characterized by well-defined winter and summer seasons that are accompanied by large annual temperature variations. Streamflow and the intra-annual variability of streamflow is a function of precipitation. Precipitation in the Paint Creek watershed is variable over location and time. The last major summary of climate and hydrology in Ohio was prepared in 1991 for the period 1931-1980 (Harstine, 1991) and included annual average precipitation and runoff. For the period 1931-1980, mean annual precipitation ranged from 38-40 inches, generally increasing downstream in the watershed, and approximately 12-14 inches (31-35%) is converted to streamflow (Harstine, 1991).

The annual and long-term variations in rainfall, from 1895-2017, are illustrated for central Ohio in Figure 23. The average annual rainfall for the last century, 1901-2000, is 38.55 inches per year but is increasing at a rate of 0.17 inches per decade (National Oceanic and Atmospheric Administration [NOAA], 2018). Long-term precipitation data, tabulated by NOAA, from stations across Ohio, indicate that annual precipitation statewide has increased at a rate of approximately 0.34 inches per decade (U.S. Department of Commerce, 2012).

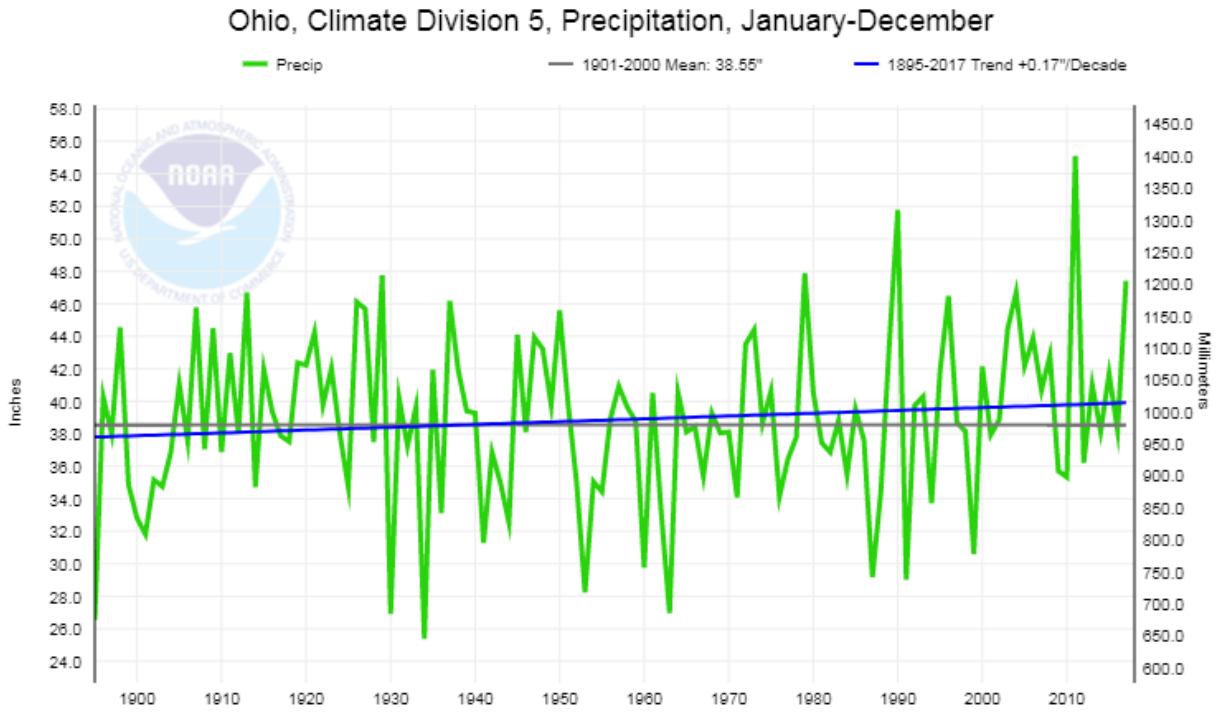

Figure 23. Annual and long-term variations in rainfall for central Ohio (National Oceanic and Atmospheric Administration, 2018).

The U.S. Geological Survey (USGS) currently operates five stream gages in the Paint Creek watershed (Table 5), most of them with long-term records. Streamflow statistics were compiled from the USGS StreamStats website. Streamflow (e.g., average, minimum, and maximum daily streamflow) increases with watershed area (Table 5). For example, downstream on Paint Creek, average daily streamflow increases from 150 cubic feet per second (cfs) at Greenfield to 1,295 cfs at Chillicothe as watershed area increases from 244 square miles to 1,136 square miles (Table 5). Minimum flows are less than 1 cfs on the smaller watersheds, on Rocky Fork Creek near Barretts Mills, and on Paint Creek at Greenfield. Minimum flow values in the Paint Creek watershed are not unusual in higher-relief watersheds dominated by glacial till and bedrock. These flows occur when streams are at baseflow. Streamflow is comprised of *baseflow* and *stormflow*. Baseflow is that portion of total streamflow derived from groundwater discharge into the stream, whereas stormflow is the portion of total streamflow that is derived directly from precipitation. The relative significance of

baseflow and stormflow to streamflow in Paint Creek is reflected in the baseflow index (BFI), a dimensionless ratio of baseflow to total streamflow. Values derived from gaging station data in the Paint Creek watershed vary between 0.27 and 0.38 (Table 5). BFI values in this range suggest that about a third of streamflow is derived from groundwater and that streamflow in the watershed is dominated by stormflow.

Table 5. *StreamStat characteristics of watersheds and streamflow for USGS gaging stations located in the Paint Creek watershed (compiled from https://streamstats.usgs.gov/ss in June, 2018). cfs = cubic feet per second; mi^2 = square miles.*

	Rocky Fork near Barretts Mills	**Rattlesnake Creek at Centerfield**	**Paint Creek near Greenfield**	**Paint Creek near Bainbridge**	**Paint Creek near Bourneville**	**Paint Creek at Chillicothe**
Station Number	03232500	03232300	03232000	03232470	03234000	03234300
Watershed Area (mi^2)	140	209	249	570	807	1136
Average Daily Streamflow (cfs)	150	243	244	584	837	1,295
Minimum Daily Streamflow (cfs)	0.5	1	0	4.2	5	22
Maximum Daily Streamflow (cfs)	9,520	5,600	14,400	21,900	44,600	25,300
Baseflow Index (dimensionless)	0.31	0.27	0.30	0.27	0.34	0.38

The maximum daily flow observed on Paint Creek occurred at the Bourneville gage on March 10, 1964 (44,600 cfs) (Table 5). Extreme flows on the Paint Creek include the 1964, 1963, 1945, 1937, and 1940 floods (Figure 26). The 1964 flood at Bourneville is the highest recorded flood stage at that location at 20.5 feet. At this stage, the low areas of Bourneville as well as low areas along Paint Creek across western Ross County are flooded. (Figure 26). For comparison, the average stage in March for the period of record for the Bourneville gage is approximately 4.34 feet. Figure 24 shows the Paint Creek valley from Grandview Cemetery during the 1937 flood, the fourth-largest flood of record. At Bourneville, the 1937 flood on Paint Creek peaked at a stage of 18.92 feet. Extreme floods have been regulated by Paint Creek Dam since 1974, but the lack of levees means that floods have access to the floodplain of Paint Creek. Figure 25 illustrates the extent of flooding resulting from the 100-year flood event. For much of the Paint Creek valley, flood water would fill the valley, which is 1.3 miles wide in places. Figure 25 also illustrates the lack of floodplain in The Narrows.

Figure 24. Flooding of Paint Creek valley in 1937 south of Chillicothe, as viewed from Grandview Cemetery. Photo courtesy of the Ross County Historical Society.

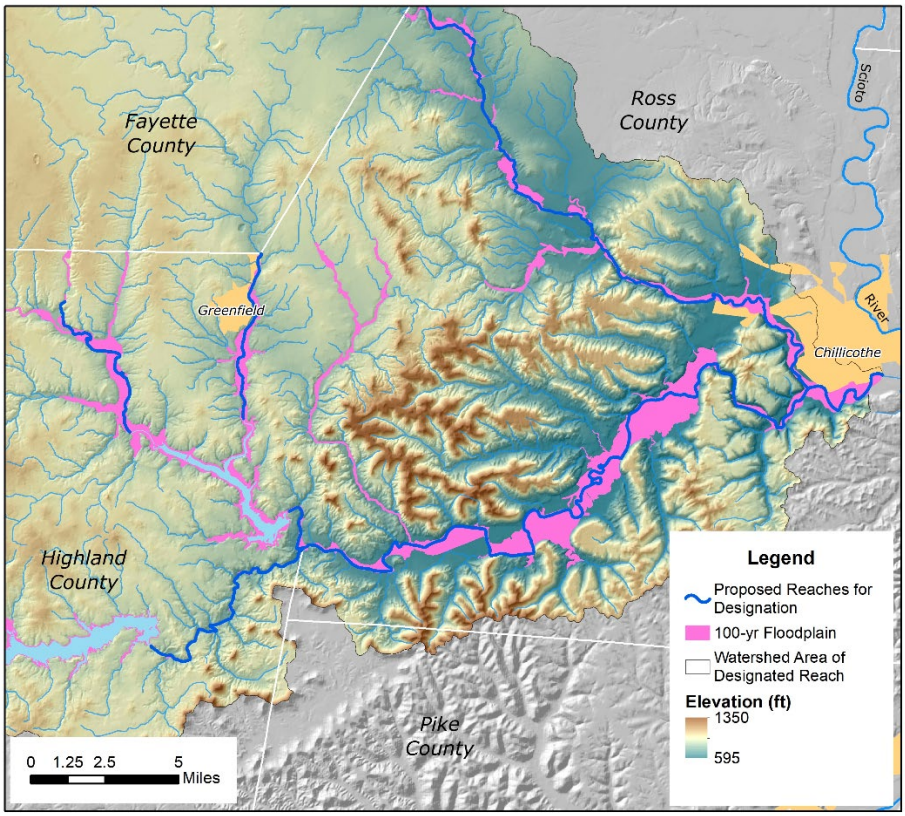

Figure 25. Map illustrating the extent of the 100-year flood within the Paint Creek watershed. Coverage by a flood of this magnitude is particularly extensive in the broad, flat valley along the mainstem of Paint Creek.

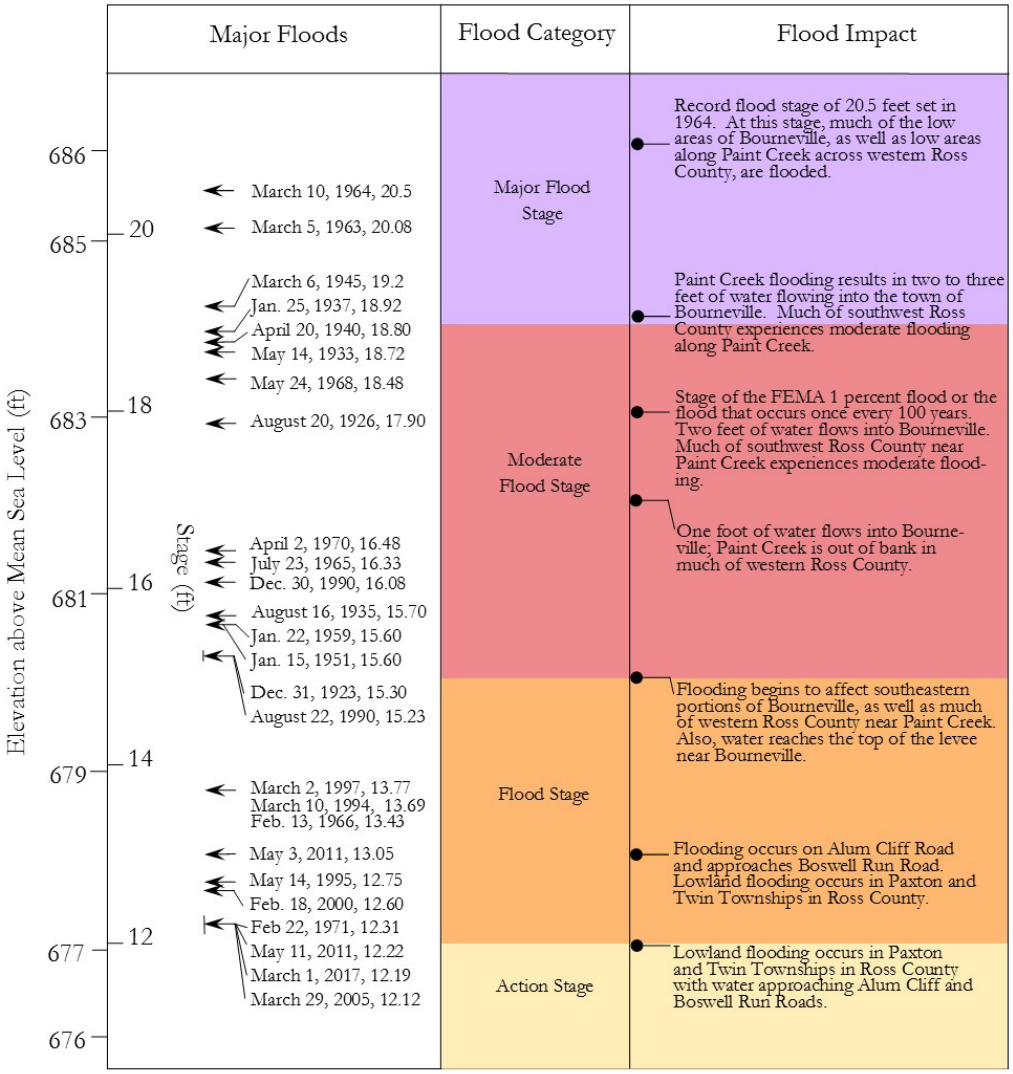

Figure 26. Flood-related data and impacts relative to the Paint Creek near the Bourneville OH (USGS 03234000) gaging station, compiled from various sources, including Koltun (2003), NOAA National Weather Service (2012), and National Flood Insurance Program (2010).

Biological Diversity

As a part of every wild, scenic and recreational designation study effort, program staff work with local partners, subject matter experts and fellow biologists and naturalists to compile lists of species for various taxonomic groups. High-quality, natural river corridors provide habitat for many different and rare species of plants and animals in addition to the aquatic organisms living in the river itself. The following species lists represent the biological diversity of the Paint Creek watershed. Many of these species are of state or federal interest.

State and federal listed species designations are noted in the species below. Definitions for each category used in Ohio follow.

ENDANGERED (E) - A native species or subspecies threatened with extirpation from the state. The danger may result from one or more causes, such as habitat loss, pollution, predation, interspecific competition, or disease.

THREATENED (T) - A species or subspecies whose survival in Ohio is not in immediate jeopardy, but to which a threat exists. Continued or increased stress will result in it becoming endangered.

SPECIES OF CONCERN (SC) - A species or subspecies that might become threatened in Ohio under continued or increased stress. Also, a species or subspecies for which there is some concern but for which information is insufficient to permit an adequate status evaluation. This category may contain species designated as a furbearer or game species but whose statewide population is dependent on the quality and/or quantity of habitat and is not adversely impacted by regulated harvest.

SPECIAL INTEREST (SI) - A species that occurs periodically and is capable of breeding in Ohio. It is at the edge of a larger, contiguous range with viable population(s) within the core of its range. These species have no federal endangered or threatened status, are at low breeding densities in the state, and have not been recently released to enhance Ohio's wildlife diversity. With the exception of efforts to conserve occupied areas, minimal management efforts will be directed for these species because it is unlikely to result in significant increases in their populations within the state.

EXTIRPATED (EXP) - A species or subspecies that occurred in Ohio at the time of European settlement and that has since disappeared from the state.

Plants - The following is a list of 728 species of ferns, herbaceous plants, grasses, sedges, shrubs and trees that have been documented as occurring in the Paint Creek watershed compiled by Rick Gardner, Chief Botanist with the ODNR Division of Natural Areas and Preserves (2020).

Ferns and Lycophytes

Adiantum pedatum (maidenhair fern)
Asplenium platyneuron (ebony spleenwort)
Asplenium rhizophyllum (walking fern)
Asplenium ruta-muraria (wall-rue) (T)
Athyrium filix-femina (lady fern)
Cystopteris protrusa (bottomland fragile fern)
Cystopteris tennessensis (tennessee bladder fern) (P)
Cystopteris tenuis (mackay's brittle fern)
Deparia acrostichoides (silvery spleenwort)
Diphasiastrum digitatum (ground-pine)
Diplazium pycnocarpon (glade fern)
Dryopteris carthusiana (spinulose wood fern)
Dryopteris goldiana (goldie's fern)
Dryopteris intermedia (common wood fern)
Dryopteris marginalis (marginal wood fern)
Equisetum arvense (field horsetail)
Lycopodium tristachyum (ground cedar, ground pine)
Onoclea sensibilis (sensitive fern)
Ophioglossum vulgatum (adder's tongue fern)
Osmunda claytoniana (interrupted fern)
Pellaea glabella (smooth cliffbrake)
Pellaea purpurea (purple cliffbrake)
Phegopteris hexagonoptera (broad beech fern)
Pleopeltis polypodioides (resurrection fern)
Polystichum acrostichoides (christmas fern)
Sceptridium dissectum (common grape fern)
Selaginella apoda (spine-moss)
Selaginella eclipes (midwest spike-moss) (T)
Thelypteris noveboracensis (new york fern)

Grasses and Sedges

Agrostis gigantea (bent grass)
Agrostis perennens (fall bent grass)
Agrostis stolonifera (creeping bent grass)
Andropogon gerardii (big bluestem)
Andropogon virginicus (broom-sedge)
Arthraxon hispidus (hairy joint grass)
Bracheyletrum erectum (long-awned wood grass)
Bromus commutatus (hairy chess)
Bromus inermis (smooth brome) (N/I)
Bromus japonicus (japanese brome)
Bromus nottowayanus (satin brome)
Bromus pubescens (hairy woodland brome)
Bromus tectorum (downy brome)
Carex albicans (oak sedge)
Carex albursina (white bear sedge)
Carex amphibola (gray wood sedge)
Carex annectens (yellow-fruited sedge)
Carex blanda (common wood sedge)
Carex bromoides (brome-like sedge)
Carex careyana (carey's sedge)
Carex davisii (davis' sedge)
Carex digitalis (narrow wood sedge)
Carex frankii (frank's sedge)
Carex glaucodea (blue-green sedge)
Carex gracilescens (two-edged sedge)
Carex granularis (meadow sedge)
Carex grayii (gray's sedge)
Carex hirsutella (hairy green sedge)
Carex hirtifolia (hirsute sedge)
Carex hitchcockiana (hitchcock's sedge)
Carex hystericina (porcupine sedge)
Carex interior (inland sedge)
Carex jamesii (james' sedge)
Carex laxiculmis (weak stemmed sedge)
Carex laxiculmis var. copulata (spreading sedge)
Carex laxiflora (loose-flowered sedge)
Carex lurida (sallow sedge)
Carex normalis (normal sedge)
Carex oligocarpa (few-fruited sedge)
Carex pedunculata (long-stalked sedge)
Carex pellita (woolly sedge)
Carex pensylvanica (pennsylvania sedge)
Carex plantaginea (seersucker sedger)
Carex platyphylla (wood sedge)
Carex radiata (radiate sedge)

Carex rosea (stellate sedge)
Carex sparganoides (bur-reed sedge)
Carex stipata (fox sedge)
Carex swanii (swan's sedge)
Carex tonsa (shaved sedge)
Carex torta (twisted sedge)
Carex umbelleta (clustered sedge)
Carex virescens (greenish sedge)
Carex vulpinoidea (northern fox sedge) (E)
Carex willdenowii (willdenow's sedge)
Chasmanthium latifolium (indian woodoats)
Cinna arundinacea (common wood reed)
Cyperus esculentus (chufa flatsedge)
Cyperus strigosus (umbrella sedge)
Dactylis glomerata (orchard grass)
Danthonia spicata (poverty grass)
Diarhenna americana (american beak grass)
Dichanthelium acuminatum (hairy panic grass)
Dichanthelium boscii (bosc's panic grass)
Dichanthelium clandestinum (deertongue grass)
Dichanthelium depauperatum (starved panic grass)
Dichanthelium dichotomum (spreading witchgrass)
Dichanthelium latifolium (broad-leaved rosette-panic grass)
Dichanthelium linearifolium (low panic grass)
Digitaria ischaemum (smooth crab grass)
Digitaria sanguinalis (hairy crab grass)
Echinochloa crusgalli (barnyard grass)
Eleocharis erythropoda (red-footed spike-rush)
Eleocharis obtusa (common spike-rush)
Elymus hystrix (bottlebrush grass)
Elymus macgregorii (macgregor's wild rye)
Elymus repens (quack grass)
Elymus riparius (riverbank wild rye)
Elymus villosus (wild rye)
Elymus virginicus (virginia wild rye)
Eragrostis frankii (sandbar love grass)
Eragrostis hypnoides (creeping love grass)
Festuca arundinacea (tall meadow fescue)
Festuca pratensis (meadow grass)
Festuca subverticillata (nodding fescue)
Glyceria striata (fowl manna grass)
Holcus lanatus (velvet grass)
Juncus biflorus (tow-flowered grass)
Juncus brachycephalis (rush)
Juncus dudleyi (dudley's rush)
Juncus effusus (soft rush)
Juncus marginatus (grass-leaved rush)
Juncus secundus (one-sided rush) (P)
Juncus tenuis (path rush)
Leersia oryzoides (rice cut grass)
Leersia virginica (woodland cut grass)
Luzula bulbosa (southern wood rush) (PT)
Luzula echinata (wood rush)
Luzula multiflora (common woodrush)
Microstegium vimineum (japanese stiltgrass) (N/I)
Miscanthus sinensis (eulalia)
Muhlenbergia shreberi (nimblewill)
Muhlenbergia sobolifera (branched muhly)
Muhlenbergia tenuiflora (slender satin grass)
Oryzopsis asperifolia (large-leaved mountain-rice) (T)
Panicum depauperatum (fall witch grass)
Panicum dichotomiflorum (fall panic grass)
Panicum gattingeri (gattinger's witch grass)
Phalaris arundinacea (reed canary grass) (N/I)
Phleum pratense (timothy)
Piptatherum racemosa (mountain-rice) (P)
Poa alsodes (grove blue grass)
Poa compressa (canada bluegrass)
Poa cuspidata (early bluegrass)
Poa pratensis (kentucky bluegrass)
Poa sylvestris (woodland bluegrass)
Poa trivialis (rough bluegrass)
Schoenoplectus acutus (hardstem bulrush)
Schoenoplectus pungens (softstem bulrush)
Scirpus atrovirens (tall green bulrush)
Scirpus georgianus (geogria bulrush)
Scirpus hattorianus (mosquito bulrush)
Scirpus pendulus (rufous bulrush)
Scirpus polyphyllus (leafy bulrush)
Setaria faberi (nodding foxtail)
Setaria pumila (foxtail)
Sorghastrum nutans (indian grass)
Tridens flavus (purpletop)

Herbaceous Plants

Abutilon theophrasti (velvet-leaf)
Acalypha rhomboidea (rhombic three-seeded mercury)
Acalypha virginica (three-seeded mercury)
Achillea millefolium (yarrow) (N/I)
Acorus calamus (sweet flag)
Actaea pachypoda (white baneberry)
Actaea racemosa (black cohosh)
Agalinis tenuifolia (slender gerardia)
Ageritina altissima (white snakeroot)
Agrimonia gryposepala (tall agrimony)
Agrimonia parviflora (swamp agrimony)
Agrimonia rostellata (woodland agrimony)
Alisma subcordatum (american water plantain)
Alliaria petiolata (garlic mustard) (N/I)
Allium burdickii (white ramp)
Allium canadense (wild onion)
Allium tricoccum (ramps)
Allium vineale (field garlic)
Amaranthus rudis (tall amaranth)
Amaranthus tuberculatus (roughfruit amaranth)
Ambrosia artemisiifolia (common ragweed)
Ambrosia trifida (great ragweed)
Amphicarpaea bracteata (hog-peanut)
Anagallis arvensis (pimpernel)
Anemone virginiana (thimbleweed)
Anemonella thalictroides (rue-anemone)
Antennaria neglecta (field pussytoes)
Antennaria plantaginifolia (plantain-leaved pussy-toes)
Anticlea elegans (white wand-lily) (P)
Aplectrum hyemale (puttyroot)
Apocynum andromisaefolium (spreading dogbane)
Apocynum cannibinum (dogbane, indian hemp)
Aquilegia canadensis (wild columbine)
Arabis hirsuta var. adpressipilis (southern hairy rock cress) (P)
Aralia racemosa (spikenard)
Arctium minus (common burdock)
Arisaema dracontium (green dragon)
Arisaema triphyllum (jack-in-the-pulpit)
Aristolochia serpentaria (virginia snakeroot)
Artemisia annua (annual wormwood)
Aruncus dioicus (goats-beard)
Asarum canadense (wild ginger)
Asclepias hirtella (green milkweed)
Asclepias incarnata (swamp milkweed)
Asclepias syriaca (common milkweed)
Asclepias tuberosa (butterfly milkweed)
Asclepias viridiflora (green milkweed)
Ascyrum hypericoides (st. andrews cross)
Aureolaria flava (smooth false foxglove)
Baptisia tinctoria (wild indigo)
Barbarea vulgaris (mustard, wintercress)
Bidens bipinnata (spanish-needles)
Bidens cernua (nodding tickseed)
Bidens connata (purple-stemmed beggar-ticks)
Bidens frondosa (devil's beggar-ticks)
Bidens vulgata (common beggar-ticks)
Blephilia hirsuta (hairy woodmint)
Boechera laevigata (smooth rock cress)
Boehemaria cylindrica (false nettle)
Brasenia schreberi (water-shield)
Brassica nigra (black mustard)
Brassica rapa (field mustard)
Cacalia atriplicifolia (pale indian plantain)
Calamintha arkansana (limestone savory)
Callitriche terrestris (terrestrial water-starwort)
Caltha palustris (masrh-marigold)
Campsis radicans (trumpet-creeper)
Cardamine angustata (slender toothwort)
Cardamine bulbosa (spring cress)
Cardamine concatenata (cut-leaved toothwort)
Cardamine douglasii (purple cress)
Cardamine hirsuta (hairy bitter cress)
Cardamine parviflora (small-flower bitter cress)
Cardamine pensylvanica (pennsylvania bitter cress)
Cassia hebecarpa (wild senna)
Caulophyllum giganteum (giant blue cohosh)
Celastrus scandens (climbing bittersweet)
Cerastium vulgatum (mouse-ear chickweed)
Chelidonium majus (celandine)
Chelone glabra (turtlehead)
Chenopodium missouriense (missouri goosefoot)
Chenopodium standleyanum (woodland goosefoot)
Chenopodium zschackei (lamb's quarters)
Chimaphila maculata (striped wintergreen)
Cichorium intybus (chicory) (N/I)
Cicuta maculata (water hemlock)
Circaea lutetiana (enchanter's nightshade)
Cirsium altissimum (tall thistle)
Cirsium arvense (canada thistle) (N/I)
Cirsium discolor (field thistle)

Cirsium vulgare (bull thistle)
Claytonia virginica (spring beauty)
Clematis viorna (leatherflower)
Clematis virginiana (virgin's bower)
Clinipodium vulgare (wild basil)
Collinsonia canadensis (horsebalm)
Comandra umbellata (star toadflax)
Commelina communis (asiatic dayflower)
Commelina virginica (virginia dayflower)
Conium maculatum (poison hemlock)
Conoclinium coelestinum (mistflower)
Conopholis americana (squawroot)
Conyza canadensis (horseweed)
Corallorhiza wisteriana (spring coral-root) (P)
Corydalis flavula (yellow corydalis)
Crocanthemum bicknellii (bicknell's frostweed)
Cryptotaenia canadensis (honewort)
Cunila origanoides (dittany)
Cuphea viscosissima (blue waxweed)
Cuscuta gronovii (common dodder)
Datura stramonium (jimson-weed)
Daucus carota (wild carrot)
Delphinium tricorne (dwarf larkspur)
Desmodium glutinosum (pointed-leaf tick trefoil)
Desmodium nudiflorum (naked-flowered tick-trefoil)
Desmodium paniculatum (panicked tick-trefoil)
Desmodium perplexum (erect tick-trefoil)
Desmodium viridiflorum (velvet leaf tick trefoil)
Dianthus armeria (Deptford pink)
Dicentra canadensis (squirrel-corn)
Dicentra cucullaria (dutchman's-breeches)
Diodia teres (rough buttonweed)
Dioscorea quaternata (wild yam)
Dipsacus fullonum (common teasel) (N/I)
Dipsacus laciniata (cut-leaved teasel)
Dodecatheon meadia (shooting star)
Draba verna (whitlow grass)
Elephantopus caroliniensis (elephant's-foot)
Epifagus virginiana (beechdrops)
Epilobium coloratum (willow-herb)
Erichtites hieraciifolia (pilewort)
Erigenia bulbosa (harbinger-or-spring)
Erigeron annuus (annual fleabane)
Erigeron philadelphicus (common fleabane)
Erigeron pulchellus (robin plantain)
Erigeron strigosus (daisy fleabane)
Erythronium albidum (white trout lily)
Erythronium americanum (yellow trout lily)
Eupatorium perfoliatum (boneset)
Eupatorium serotinum (late-flowering thoroughwort)
Euphorbia commutata (wood spurge)
Euphorbia esula (leafy spurge)
Euphorbia humistrata (spreading spurge)
Euphorbia nutans (nodding spurge)
Euthamia graminifolia (lance-leaved goldenrod)
Eutrochium fistulosum (hollow-stem joe-pye)
Eutrochium purpureum (wide-leaved joe-pye weed)
Fallopia convolvulus (false buckwheat)
Fallopia japonica (japanese knotweed) (N/I)
Fallopia scandens (climbing false buckwheat)
Fillipendula rubra (queen-of-the-prairie)
Fragaria virginiana (wild strawberry)
Galinsoga ciliata (quickweed)
Galium aparine (cleavers)
Galium asprellum (rough bedstraw)
Galium circaezans (wild licorice)
Galium concinnum (shining bedstraw)
Galium lanceolatum (lance-leaved bedstraw)
Galium mollugo (wild madder)
Galium pilosum (hairy bedstraw)
Galium triflorum (fragrant bedstraw)
Geranium maculatum (wild geranium)
Geum canadense (white avens)
Geum verum (spring avens)
Gillenia stipulata (american ipecac)
Glechoma herbacea (ground ivy)
Goodyera pubescens (rattlesnake-plantain)
Gratiola neglecta (clammy hedge hyssop)
Hackelia virginiana (stickseed)
Hedeoma pulegioides (american pennyroyal)
Helenium autumnale (sneezeweed)
Helenium flexuosum (purple-headed sneezeweed)
Helianthus annuus (common sunflower)
Helianthus decapetalus (thin-leaved sunflower)
Helianthus divaricatus (woodland sunflower)
Helianthus hirsutus (hairy sunflower)
Helianthus microcephalus (small wood sunflower)
Helianthus tuberosus (jerusalem-artichoke)
Heliopsis helianthoides (false sunflower)
Hemerocallis fulva (orange day lily)
Hepatica acutiloba (sharp-lobed hepatica)
Hesperis matronalis (dame's rocket) (N/I)
Heuchera americana (blunt-lobed hepatica)
Hieracium gronovii (hairy hawkweed)
Hieracium paniculatum (panicked hawkweed)
Hieracium pratense (field hawkweed)

Hieracium scabrum (rough hawkweed)
Hieracium venosum (rattlesnake hawkweed)
Houstonia caerulea (bluets)
Houstonia canadensis (Canada bluets)
Houstonia tenuifolia (narrow-leaved bluets)
Hybanthus concolor (green violet)
Hydrastis canadensis (goldenseal)
Hydrocotyle sibthorpioides (lawn marsh pennywort)
Hydrophyllum appendiculatum (appendaged waterleaf)
Hydrophyllum macrophyllum (large-leaf waterleaf)
Hydrophyllum virginanum (virginia waterleave)
Hypericum hypericoides (st. andrew's cross)
Hypericum mutilum (st. john's-wort)
Hypericum perforatum (common st. john's-wort) (N/I)
Hypericum punctatum (dotted st. john's-wort)
Hypochoeris radicata (cat's ear)
Hypoxis hirsuta (yellow star grass)
Impatiens capensis (spotted jewelweed)
Impatiens pallida (yellow jewelweed)
Ipomoea hederacea (ivy-leaved morning glory)
Ipomoea pandurata (wild potato vine)
Isopyrum biternatum (false rue-anemone)
Jeffersonia diphylla (twinleaf)
Justicia americana (water willow)
Lactuca biennis (tall blue lettuce)
Lactuca canadensis (common blue lettuce)
Lactuca floridana (florida blue lettuce)
Lactuca saligna (willow-leaved lettuce)
Lactuca serriola (prickly lettuce)
Lamium amplexicaule (henbit)
Lamium purpureum (purple dead nettle)
Laportea canadensis (wood nettle)
Lechea tenuifolia (narrow-leaved pinweed) (P)
Lemna minor (duckweed)
Lepidium virginicum (wild peppergrass)
Lespedeza hirta (hairy bushclover)
Lespedeza intermedia (violet lespedeza)
Lespedeza repens (creeping bushclover)
Lespedeza stipulacea (korean bushclover)
Lespedeza striata (japanese bushclover)
Leucanthemum vulgare (oxeye daisy)
Ligustrum vulgare (common privet) (N/I)
Linum medium (stiff yellow flax)
Linum virginianum (virginia yellow flax)
Liparis liliifolia (large twayblade)
Lithospermum officinale (european gromwell)
Lobelia inflata (indian tobacco)
Lobelia siphilitica (great blue lobelia)
Lobelia spicata (spiked lobelia)
Lotus corniculatus (birdsfoot trefoil)
Ludwigia alternifolia (seedbox)
Lychnis alba (white campion)
Lycopus americanus (american water-horehound)
Lycopus rubellus (stalked bugleweed)
Lycopus virginicus (virginia bugleweed)
Lysimachia ciliata (fringed loosestrife)
Lysimachia nummularia (moneywort) (N/I)
Lysimachia quadrifolia (four-flowered loosestrife)
Maianthemum racemosum (feathery false lily of the valley)
Malva neglecta (common mallow)
Medicago lupulina (black medick)
Melilotus albus (white sweet clover) (N/I)
Melilotus officinalis (yellow sweet clover) (N/I)
Menispermum canadense (moonseed)
Mentha spicata (spearmint)
Mertensia virginica (virginia bluebells)
Mimulus ringens (common monkeyflower)
Mitchella repens (partridgeberry)
Mitella diphylla (miterwort)
Mollugo verticillata (carpetweed)
Monarda clinopodia (white bergamot)
Monarda fistulosa (wild bergamot)
Monotropa hypopithys (pinesap)
Monotropa uniflora (indian pipe)
Nymphaea odorata (sweet-scented water lily)
Oenothera biennis (common evening primrose)
Oenothera perennis (small sundrops)
Ornithogalum umbellatum (star-of-bethlehem)
Osmorhiza claytonii (hairy sweet cicely)
Osmorhiza longistylis (smooth sweet cicely)
Oxalis dillenii (southern wood sorrel)
Oxalis grandis (great yellow wood sorrel)
Oxalis stricta (upright yellow wood sorrel)
Oxalis violacea (violet wood sorrel)
Oxypolis rigidior (cowbane)
Packera aurea (golden ragwort)
Packera glabella (butterweed)
Packera obovata (round-leaved squaw-weed)
Panax quinquefolius (american ginseng)
Paronychia canadensis (smooth forked-chickweed)
Parthenocissus quinquefolia (virginia creeper)
Pedicularia lanceolata (swamp lousewort)
Passiflora lutea (yellow passion flower)
Penstemon digitali (foxglove beardtongue)
Penstemon hirsutus (hairy beardtongue)
Penthorum sedioides (ditch stonecrop)

Persicaria amphibia (water knotweed)
Persicaria hydropiper (water pepper)
Persicaria longiseta (oriental lady's-thumb)
Persicaria maculata (lady's-thumb)
Persicaria pensylvanica (pennsylvania smartweed)
Persicaria punctata (knotweed)
Persicaria sagittata (arrow-leaved tear-thumb)
Persicaria virginiana (jumpseed)
Phlox divaricata (wild blue phlox)
Phlox glaberrima (smooth phlox)
Phlox maculata (meadow phlox)
Phlox paniculata (garden phlox)
Phlox pilosa (downy phlox)
Phryma leptostachya (lopseed)
Phyla lanceolata (frog-fruit)
Physalis heterophylla (clammy ground cherry)
Phytolacca americana (pokeweed)
Pilea pumila (clearweed)
Plantago aristata (bracted plantain)
Plantago lanceolata (english plantain) (N/I)
Plantago major (common plantain) (N/I)
Plantago rugellii (rugel's plantain)
Platango virginiana (hoary plantain)
Platanthera lacera (ragged fringed orchid)
Podophyllum peltatum (mayapple)
Polemonium reptans (jacob's-ladder)
Polygala sanguinea (field milkwort)
Polygonatum biflorum (common solomon's seal)
Polygonatum pubescens (solomon's seal)
Polymnia canadensis (pale flower leafcup)
Portulaca olearacea (purselane)
Potamogeton foliosus (leafy pondweed)
Potentilla anserina (dwarf cinquefoil)
Potentilla candensis (canada cinquefoil)
Potentilla norvegica (rough cinquefoil)
Potentilla recta (rough-fruited cinquefoil)
Potentilla simplex (common cinquefoil)
Prenanthes altissima (tall white lettuce)
Prenanthes crepidinea (croymbed rattle-snake root)
Prenanthes serpentaria (lion's foot)
Prunella vulgaris (selfheal)
Pseaudognaphalium obtusifolium (sweet everlasting)
Pycnanthemum tenuifolium (narrow-leaved mountain mint)
Ranunculus abortivus (kidney-leaved buttercup)
Ranunculus allegheniensis (buttercup)
Ranunculus hispidus (bristly buttercup)
Ranunculus recurvatus (crowfoot)
Ratibida laciniata (green-headed coneflower)
Rubus allegheniensis (Allegheny blackberry)
Rubus flagellaris (dewberry)
Rubus idaeus (american red raspberry)
Rubus occidentalis (black raspberry)
Rubus odoratus (flowering raspberry)
Rubus pensylvanicus (pennsylvania blackberry)
Rudbeckia hirta (black-eyed susan)
Rudbeckia laciniata (green headed coneflower)
Rudbeckia triloba (three-lobed coneflower)
Ruellia caroliniensis (hairy ruellia)
Ruellia strepens (limestone wild petunia)
Rumex acetosella (field sorrel) (N/I)
Rumex crispus (curled dock) (N/I)
Rumex obtusifolius (bitter dock) (N/I)
Sabatia angularis (rose-pink)
Sagittaria latifolia (common arrowhead)
Salix nigra (black willow)
Salvia lyrata (lyre-leaved sage)
Sambucus canadensis (common elderberry)
Samolus floribundus (water pimpernel)
Sanguinaria canadensis (bloodroot)
Sanicula canadense (black snakeroot)
Sanicula gregaria (clustered black snakeroot)
Sanicula marilandica (maryland sanicle)
Sanicula trifoliata (trifoliate snakeroot)
Satureja vulgaris (wild basil)
Scrophularia marilandica (maryland figwort)
Scutellaria elliptica (hairy skullcap)
Scutellaria lateriflora (mad-dog skullcap)
Scutellaria nervosa (veined skullcap)
Scutellaria ovata (heart-leaved skullcap)
Sedum acre (mossy stonecrop)
Sedum ternatum (wild stonecrop)
Sericocarpus linifolius (narrow-leaved white-topped aster) (T)
Seriocarpus asteroides (toothed white-top aster)
Silene caroliniana var. *wherryi* (wherry's catchfly) (T)
Silene stellata (starry campion)
Silene virginica (fire pink)
Silphium perfoliatum (cup-plant)
Silphium trifoliatum (whorled rosinweed)
Sisyrinchium angustifolium (stout blue-eyed grass)
Smilacina racemosa (solomon's-plume)
Smilax glauca (catbrier)
Smilax herbacea (carrion flower)
Smilax hispida (bristly greenbrier)
Smilax lasioneura (carrion flower)
Smilax rotundifolia (greenbrier)
Solidago caesia (blue-stemmed goldenrod)

Solidago flexicaulis (zigzag goldenrod)
Solidago gigantea (smooth goldenrod)
Solidago hispida (hispid goldenrod)
Solidago juncea (early goldenrod)
Solidago nemoralis (old field goldenrod)
Solidago patula (rough-leafed goldenrod)
Solidago squarrosa (stout goldenrod)
Solidago ulmifolia (elm-leaved goldenrod)
Sonchus arvensis (field sow-thistle)
Sonchus oleraceus (common sow-thistle)
Sparganium americanum (american burreed)
Specularia perfoliata (venus looking-glass)
Spiranthes gracilis (slender ladies' tresses)
Spiranthes ovalis (lesser ladies' tresses)
Spiranthes vernalis (grass-leaved ladies' tresses)
Stachys nuttallii (nuttall's hedge nettle)
Stachys tenuifolia (smooth hedge nettle)
Stellaria corei (core's chickweed)
Stellaria media (common chickweed)
Stellaria pubera (chickweed)
Stylophorum diphyllum (wood poppy)
Sullivantia sullivantii (sullivantia)
Symphyotrichum cordifolium (heat-leaved aster)
Symphyotrichum lanceolatum (eastern lined aster)
Symphyotrichum laterifolium (calico aster)
Symphyotrichum ontarionis (bottomland aster)
Symphyotrichum pilosum (heath aster)
Symphyotrichum prenanthoides (crooked-stemmed aster)
Symphyotrichum puniceum (bristly aster)
Symphyotrichum racemosum (small white aster)
Symphyotrichum shortii (short's aster)
Symphyotrichum undulatum (wavy-leaved aster)
Symphyotrichum urophyllum (arrow-leaved blue aster)
Syringa vulgaris (common lilac)
Taenidia integerrima (yellow pimpernel)
Taraxacum officinale (common dandelion) (N/I)
Taxus canadensis (canada yew) (P)
Teucrium canadense (american germander)
Thalictrum dasycarpum (purple meadow-rue)
Thalictrum dioicum (early meadow-rue)
Thalictrum pubescens (tall meadow rue)
Thaspium barbinode (meadow parsnip)
Tiarella cordifolia (foamflower)
Tipularia discolor (cranefly orchid)
Toxicodendron radicans (poison ivy)
Tradescantia subaspera (spiderwort)
Tradescantia virginiana (virginia spiderwort)
Tragopogon dubius (yellow goat's beard)
Trifolilum dubium (hop clover)
Trifolium agrarium (yellow clover)
Trifolium hybridum (alsike clover)
Trifolium pratense (red clover)
Trifolium procumbens (low hop clover)
Trifolium repens (white clover)
Trillium flexipes (bent trillium)
Trillium grandiflorum (large white trillium)
Trillium nivale (snow trillium)
Trillium sessile (toadshade)
Triodanis perfoliata (venus looking-glass)
Tussilago farfara (coltsfoot) (N/I)
Typha angustifolia (narrow-leaved cattail) (N/I)
Typha latifolia (broad-leaved cattail)
Urtica dioica (stinging nettle) (N/I)
Uvularia grandiflora (large-flowered bellwort)
Uvularia perfoliata (bellwort)
Uvularia sessilifolia (wild oats)
Vaccinium corymbosum (highbush blueberry)
Vaccinium pallidum (upland low blueberry)
Vaccinium stamineum (beerberry)
Valeriana pauciflora (large-flowered valerian)
Valerianella radiata (beaked cornsalad)
Verbascum blattaria (moth mullein)
Verbascum thapsus (common mullein)
Verbena hastata (blue vervain)
Verbena utricifolia (white vervain)
Verbesina alternifolia (wingstem)
Vernonia gigantea (common ironweed)
Veronica officinalis (common speedwell)
Veronica persica (persian speedwell)
Veronica polita (speedwell)
Veronica serpyllifolia (thyme leaved speedwell)
Vinca minor (myrtle)
Viola affinis (pale early violet)
Viola canadensis (canada violet)
Viola cucullata (marsh blue violet)
Viola palmata (palmate violet)
Viola pubescens (yellow violet)
Viola sororia (common blue violet)
Viola striata (creamy white violet)
Viola subsinuata (early blue violet)
Vitis aestivalis (summer grape)
Vitis riparia (river grape)
Vitis vulpine (frost grape)
Xanthium strumonium (cocklebur)

Trees and Shrubs

Acer negundo (boxelder)
Acer nigrum (black maple)
Acer rubrum (red maple)
Acer saccharinum (silver maple)
Acer saccharum (sugar maple)
Aesculus glabra (ohio buckeye)
Aesculus octandra (yellow buckeye)
Ailanthus altissima (tree-of-heaven) (N/I)
Amelanchier arborea (serviceberry)
Asimina triloba (pawpaw)
Berberis thunbergii (japanese barberry)
Carpinus caroliniana (musclewood)
Carya cordiformis (bitternut hickory)
Carya glabra (pignut hickory)
Carya laciniosa (shellbark hickory)
Carya ovalis (sweet pignut hickory)
Carya ovata (shagbark hickory)
Carya tomentosa (mockernut hickory)
Catalpa speciosa (northern catalpa) (N/I)
Celtis occidentalis (common hackberry)
Cephalanthus occidentalis (buttonbush)
Cercis canadensis (redbud)
Chionanthus virginicus (fringe tree) (P)
Cornus alternifolia (alternate-leaf dogwood)
Cornus drummondii (rough leaved dogwood)
Cornus florida (flowering dogwood)
Crataegus crus-gali (cockspur hawthorn)
Diospyrus virginiana (persimmon)
Dirca palustris (leatherwood)
Elaeagnus umbellata (autumn-olive) (N/I)
Euonymus alatus (winged wahoo)
Euonymus atropurpureus (wahoo)
Fagus grandifolia (american beech)
Fraxinus americana (white ash)
Fraxinus pensylvanica (green ash)
Fraxinus quadrangulata (blue ash)
Gaylussacia baccata (black huckleberry)
Gleditsia triacanthos (honey locust)
Hamamelis virginiana (witch hazel)
Hydrangea arborescens (wild hydrangea)
Juglans cinerea (white walnut)
Juglans nigra (black walnut)
Juniperus virginiana (eastern red cedar)
Lindera benzoin (spicebush)
Liriodendron tulipifera (tuliptree)
Lonicera japonica (japanese honeysuckle) (N/I)
Lonicera maackii (amur honeysuckle) (N/I)
Lonicera morrowii (morrow's honeysuckle) (N/I)
Lonicera reticulata (grape honeysuckle)
Lonicera tatarica (tatarian honeysuckle) (N/I)
Lonicera x bella (pretty honeysuckle)
Morus alba (white mulberry)
Morus rubra (red mulberry)
Nyssa sylvatica (black gum)
Ostrya virginiana (hop hornbeam)
Paulownia tomentosa (princess-tree)
Philadelphus coronarius (sweet mock orange)
Pinus resinosa (red pine)
Pinus strobus (white pine)
Pinus virginiana (virginica pine)
Platanus occidentalis (sycamore)
Populus deltoides (cottonwood)
Prunus avium (sweet cherry)
Prunus serotina (wild black berry)
Pyrus coronaria (wild crabapple)
Quercus alba (white oak)
Quercus bicolor (swamp white oak)
Quercus coccinea (scarlet oak)
Quercus imbricaria (shingle oak)
Quercus muhlenbergia (chinquapin oak)
Quercus palustris (pin oak)
Quercus prinus (chestnut oak)
Quercus rubra (red oak)
Quercus velutina (black oak)
Quercus x leana (lea's oak)
Rhus copallina (winged sumac)
Rhus glabra (smooth sumac)
Rhus typhina (staghorn sumac)
Ribes cynosbati (gooseberry)
Robinia hispida (rose acacia)
Robinia pseudoacacia (black locust)
Rosa caroliniana (pasture rose)
Rosa multiflora (multiflora rose) (N/I)
Rosa setigera (prairie rose)
Salix discolor (pussy willow)
Salix eriocephala (diamond willow)
Salix interior (sandbar willow)
Sassafras albidum (sassafras)
Staphylea trifolia (bladdernut)
Symphoricarpos orbiculatus (indian currant, coralberry)
Thuja occidentalis (arbor vitae) (P)

Tilia americana (american basswood)
Tsuga canadensis (eastern hemlock)
Ulmus americana (american elm)
Ulmus pumila (siberian elm)
Ulmus rubra (slippery elm)
Viburnum acerifolium (maple-leaved viburnum)
Viburnum molle (soft-leaved arrow-wood) (T)
Viburnum prunifolium (blackhawk)

Animals - Invertebrates

Ephemeroptera (Mayflies). The following 28 species of mayflies have been documented along Paint Creek, North Fork Paint Creek, and Rattlesnake Creek. Many genera have the same common name (i.e., tiny blue-winged olive) or vary when discussing nymphs versus adults. The same common name genus in the list does not imply they are in the same taxonomic genus; refer to the scientific name. Where species could not be identified or the species itself has no common name, the common family-level name is given. The information was supplied by the ODNR Division of Natural Areas and Preserves and is taken from Ohio Environmental Protection Agency (2008b).

Baetidae (Family of Small Minnow Mayflies)
Acentrella turbida (Species: orange-backed small minnow mayfly)
Acerpenna macdunnoughi (Genus: tiny blue-winged olive)
Acerpenna pygmaea (Genus: tiny blue-winged olive)
Baetis flavistriga (Genus: blue-winged olive)
Baetis intercalaris (Species: half brown small minnow mayfly)
Callibaetis sp (Genus: speckled spinner)
Centroptilum sp (Genus: small spurwing)
Heterocloeon (Iswaeon) anoka (Genus: tiny blue-winged olive)
Paracloeodes sp 2
Plauditus (Genus: tiny blue-winged olive)
Procloeon viridoculare (Species: cat-eye small minnow mayfly)
Pseudocloeon propinquum (Species: Rock Island small minnow mayfly)
Serratella deficiens (Genus: blue-winged olive)

Caenidae (Family of Small Squaregill Mayflies)
Caenis sp (Genus: angler's curse)

Ephemerellidae (Family of Spiny Crawler Mayflies)
Ephemerellidae
Eurylophella sp

Ephemeridae (Family of Common Burrower Mayflies)
Hexagenia limbate (Species: Michigan hex burrowing mayfly)

Heptageniidae (Family of Flatheaded Mayflies)
Leucrocuta sp
Maccaffertium exiguum (Species: meager flat-headed mayfly)
Maccaffertium mexicanum integrum (Genus: cream cahill)
Maccaffertium pulchellum (Genus: light cahill)
Maccaffertium terminatum (Species: terminal flat-headed mayfly)
Nixe sp
Stenacron sp (Genus: light cahill)
Stenonema femoratum (Species: red fox flat-headed mayfly)

Isonychiidae (Family of Brushlegged Mayflies)
Isonychia sp (Genus: slate drake)

Leptohyphidae (Family of Little Stout Crawler Mayflies)
Tricorythodes sp (Genus: tricos)

Potamanthidae (Family of Hacklegill Mayflies)
Anthopotamus sp (Genus: golden drake)

Plecoptera (Stoneflies). The following five species of stoneflies have been documented along Paint Creek, North Fork Paint Creek, and Rattlesnake Creek. Some genera have the same common name (i.e., golden stone) or vary when talking about nymphs versus adults. Seeing the same common name genus in the list does not imply they are in the same taxonomic genus; refer to the scientific name. Where species could not be identified or the species itself has no common name, the common family-level name is given. The information was supplied by the ODNR Division of Natural Areas and Preserves and is taken from Ohio Environmental Protection Agency (2008b).

Perlidae (Family of Common Stoneflies)
Agnetina capitata complex (Genus: golden stone)
Agnetina flavescens (Genus: golden stone)
Neoperla clymene complex
Perlesta placida complex (Genus: golden stone)
Perlinella sp

Trichoptera (Caddisflies). The following 32 species of caddisflies have been documented along Paint Creek, North Fork Paint Creek, and Rattlesnake Creek. Some genera have the same common name (i.e., spotted sedge) or vary when talking about nymphs versus adults. Seeing the same common name genus in the list does not imply they are in the same taxonomic genus; refer to the scientific name. Where species could not be identified or the species itself has no common name, the common family-level name is given. The information was supplied by the ODNR Division of Natural Areas and Preserves and is taken from Ohio Environmental Protection Agency (2008b).

Glossosomatidae (Family of Saddlecase Maker Caddisflies)
Protoptila sp (Genus: pseudo-microcaddisfly)

Helicopsychidae (Family of Snailcase Maker Caddisflies)
Helicopsyche borealis (Species: speckled peters)

Hydropsychidae (Family of Common Netspinner Caddisflies)
Cheumatopsyche sp (Genus: little sister sedge)
Hydropsyche aerate (Genus: spotted sedge)
Hydropsyche bidens (Genus: spotted sedge)
Hydropsyche depravata group (Genus: spotted sedge)
Hydropsyche dicantha (Genus: spotted sedge)
Hydropsyche frisoni (Genus: spotted sedge)
Hydropsyche orris (Genus: spotted sedge)
Hydropsyche simulans (Genus: spotted sedge)
Macrostemum zebratum (Genus: glossy wing sedge)

Hydroptilidae (Family of Micro Caddisflies)
Hydroptilidae
Ochrotrichia sp
Oxyethira sp (Genus: cream and brown micro caddisfly)

Leptoceridae (Family of Longhorned Case Maker Caddisflies)
Ceraclea sp (Genus: scaly-wing sedge)
Ceratopsyche morosa group (Genus: spotted sedge)
Mystacides sepulchralis (Genus: black dancer)
Nectopsyche candida (Genus: white miller)
Nectopsyche diarina (Genus: white miller)
Oecetis avara (Species: tan spotted-wing long-horned sedge)
Oecetis nocturna (Genus: long-horn sedge)
Oecetis persimilis (Genus: long-horn sedge)
Triaenodes marginatus
Triaenodes perna

Limnephilidae (Family of Northern Case Maker Caddisflies)
Pycnopsyche sp (Genus: great autumn brown sedge)

Philopotamidae (Family of Fingernet Caddisflies)
Chimarra obscura (Genus: little black sedge)

Polycentropodidae (Family of Trumpetnet and Tubemaker Caddisflies)
Cyrnellus fraternus
Neureclipsis sp (Genus: little red twilight sedge)
Nyctiophylax sp (Genus: dinky light summer sedge)
Polycentropus sp (Genus: brown checkered summer sedge)
Psychomyia flavida (Genus: dinky purple breasted sedge)

Uenoidae (Family of Uenoid Case Maker Caddisflies)
Neophylax sp (Genus: autumn mottled sedge)

Odonata (Dragonflies and Damselflies). The following 35 species of damselflies and dragonflies have been documented along Paint Creek and its tributaries. Provided by Kelly Capuzzi, Environmental Specialist 2, Ohio EPA, from the Division of Surface Water's EA3 database (2020).

Aishnidae (Darners)
Aeshna sp (mosaic darners)
Aeshna umbrosa (shadow darner)
Anax sp (darner species)
Anax junius (green darner)
Basiaeschna janata (springtime darner)
Boyeria sp (spotted darners)
Boyeria grafiana (ocellated darner)
Boyeria vinosa (fawn darner)
Nasiaeschna pentacantha (cyrano darner)

Calopterygidae (Broad-winged damselflies)
Calopteryx sp (jewelwings)
Hetaerina sp (rubyspots)

Coenagrionidae (Narrow-winged damselflies)
Argia sp (Blue-fronted dancer)

Cordulegastridae (Spiketails)
Cordulegaster sp (spiketail)

Corduliidae (Emeralds)
Epitheca (Epicordulia) princeps (Prince baskettail)
Neurocordulia sp (shadowdragons)
Neurocordulia molesta (smoky shadowdragon)
Neurocordulia obsolete (shadowdragon)
Neurocordulia yamaskanensis (stygian shadowdragon)
Somatochlora sp (striped emeralds)
Epitheca (Tetragoneuria) sp (baskettail genus)

Gomphidae (Clubtails)
Dromogomphus sp (spinylegs)
Dromogomphus spinosus (black-shouldered spinyleg)
Gomphus Complex (clubtail genus)
Hagenius brevistylus (dragonhunter)
Ophiogomphus sp (snaketails)
Stylogomphus albistylus (eastern least clubtail)

Libellulidae (Skimmers)
Erythemis simplicicollis (eastern pondhawk)
Libellula sp (skimmer genus)
Libellula luctuosa (widow Skimmer)
Pachydiplax longipennis (blue dasher)
Perithemis tenera (eastern amberwing)
Plathemis lydia (common whitetail)

Macromiidae (Cruisers)
Didymops transversa (stream cruiser)
Macromia sp (river cruisers)
Macromia illinoiensis (swift river cruiser)

Mollusca (Freshwater Mussels). Solomon (2002) compiled results from two mussel surveys conducted by Michael Hoggarth, Otterbein University, in 1994 and 2001 in Rocky Fork Creek in the vicinity of Seven Caves (RM 1.0-1.1) and Michael Bolton and Charles Boucher, Ohio EPA, in 1997 in Paint Creek downstream of Bainbridge. The results of these surveys indicate that at least 19 different mussel species live in the watershed, four state-listed species of concern (SC), one state-listed threatened species (T), state endangered (E) and federally endangered (FE) species.

The following mussel species have been collected in the Paint Creek Watershed between 1994 and 2001 with two additional species *Ligumia recta* (black sandshell) and *Potamilus ohiensis* (pink papershell) being collected by Hoggarth as part of a survey of the Paint Creek upstream of the U.S. Route 23 Bridge in 2012.

Unionidae

Alasmidonta marginata (elktoe) (SC)
Amblema plicata (threeridge)
Eurynia dilatata (spike)
Epioblasma triquetra (snuffbox) (E, FE)
Fusconaia flava (Wabash pig-toe)
Lamsilis cardium (=ventricosa) (plain pocketbook)
*Lampsilis fasciola (*wavy-rayed lampmussel) (SC)
Lamsilis siliquoidea (fatmucket)
Lasmigona complanata (white heel-splitter)
Lasmigona costata (fluted-shell)
Leptodea fragilis (fragile papershell)
Ligumia recta (black sandshell) (T)
Potamilus alatus (pink heel-splitter)
Potamilus ohiensis (pink papershell)
Ptychobranchus fasciolaris (kidney shell) (SC)
Pyganodon grandis (formerly Anodonta grandis) (giant floater)
Quadrula quadrula (maple leaf)
Tritogonia verrucose (pistolgrip)
Truncilla donaciformis (fawnsfoot) (T)
Truncilla truncata (deertoe) (SC)
Utterbackiana suborbiculata (flat floater)

Animals - Vertebrates

Fish. The following list of 118 fish species and two hybrids have been recorded from the Paint Creek system by various sources. This list was compiled by Brian Zimmerman, Research Associate at the Stream and River Ecology (STRIVE) Lab, within the School of Environment and Natural Resources at The Ohio State University in 2020.

Acipenseridae (Sturgeons)
Acipenser fulvescens (lake sturgeon) (E)
Scaphirhynchus platorynchus (shovelnose sturgeon) (E)

Amiidae (Bowfin)
Amia calva (bowfin)

Anguillidae (Eel)
Anguilla rostrata (American eel)

Atherinopsidae (Silversides)
Labidesthes sicculus (brook silverside)

Catostomidae (Suckers)
Carpiodes carpio (river carpsucker)
Carpiodes cyprinus (quillback carpsucker)
Carpiodes velifer (highfin carpsucker)
Catostomus commersonii (white sucker)
Cycleptus elongatus (blue sucker) (T)
Erimyzon claviformis (western creek chubsucker) (SC)
Hypentelium nigricans (northern hog sucker)
Ictiobus bubalus (smallmouth buffalofish)
Ictiobus cyprinellus (bigmouth buffalofish)
Ictiobus niger (black buffalofish)
Minytrema melanops (spotted sucker)
Moxostoma anisurum (silver redhorse)
Moxostoma breviceps (smallmouth redhorse)
Moxostoma carinatum (river redhorse)
Moxostoma duquesnii (black redhorse)
Moxostoma erythrurum (golden redhorse)

Centrarchidae (Sunfishes)
Ambloplites rupestris (rock bass)
Lepomis cyanellus (green sunfish)
Lepomis gibbosus (pumpkinseed sunfish)
Lepomis gulosus (warmouth sunfish)
Lepomis humilis (orange spotted sunfish)
Lepomis macrochirus (bluegill sunfish)
Lepomis megalotis megalotis (central longear sunfish)
Lepomis microlophus (redear sunfish)
Micropterus dolomieu (smallmouth bass)
Micropterus punctulatus (spotted bass)
Micropterus salmoides (largemouth bass)
Pomoxis annularis (white crappie)
Pomoxis nigromaculatus (black crappie)

Clupeidae (Herring)
Alosa chrysochloris (skipjack herring)
Dorosoma cepedianum (gizzard shad)
Dorosoma petenense (threadfin shad)

Cottidae (Sculpin)
Cottus bairdii bairdii (northern mottled sculpin)

Cyprinidae (Minnows)
Campostoma anomalum (central stoneroller minnow)
Carassius auratus (goldfish)
Chrosomus erythrogaster (southern redbelly dace)
Ctenopharyngodon idella (grass carp) (N/I)
Cyprinella spiloptera (spotfin shiner)
Cyprinellawhipplei (steelcolor shiner)
Cyprinuscarpio (common carp)
Erimystax dissimilis (streamline chub)
Erimystax x-punctatus (gravel chub)
Hybopsis amblops (bigeye chub)
Hypophthalmichthys molitrix (silver carp) (N/I)
Hypophthalmichthys nobilis (bighead carp) (N/I)
Luxilus chrysocephalus (striped shiner)
Lythrurus fasciolaris (scarlet shiner)
Macrhybopsis storeriana (silver chub)
Nocomis biguttatus (hornyhead chub)
Notemigonus crysoleucas (golden shiner)
Notropis atherinoides (emerald shiner)
Notropis blennius (river shiner)
Notropis buccatus (silverjaw minnow)
Notropis heterolepis (blacknose shiner) (X)
Notropis photogenis (silver shiner)
Notropis rubellus (rosyface shiner)
Notropis stramineus (sand shiner)
Notropis volucellus (mimic shiner)
Notropis wickliffi (channel shiner)
Opsopoeodus emiliae (pugnose minnow) (E)
Phenacobius mirabilis (suckermouth minnow)
Pimephales notatus (bluntnose minnow)
Pimephales promelas (fathead minnow)
Pimephales vigilax (bullhead minnow)
Rhinichthys obtusus (western blacknose dace)
Semotilus atromaculatus (creek chub)

Esocidae (Pikes)
Esox americanus vermiculatus (grass pickerel)
Esox masquinongy (muskellunge) (SC)
Umbra limi (central mudminnow)

Fundulidae (Topminnows)
Fundulus notatus (blackstripe topminnow)

Hiodontidae (Mooneye)
Hiodon alosoides (goldeye)
Hiodon tergisus (mooneye)

Ictaluridae (Catfish)
Ameiurus melas (black bullhead)
Ameiurus natalis (yellow bullhead)
Ameiurus nebulosus (brown bullhead)
Ictalurus furcatus (blue catfish) (SC)
Ictalurus punctatus (channel catfish)
Noturus flavus (stonecat madtom)
Noturus gyrinus (tadpole madtom)
Noturus miurus (brindled madtom)
Noturus stigmosus (northern madtom) (E)
Pylodictis olivaris (flathead catfish)

Lepisosteidae (Gar)
Lepisosteus osseus (longnose gar)
Lepisosteus platostomus (shortnose gar)

Moronidae (Bass)
Morone chrysops (white bass)
Morone saxatilis (striped bass)
Morone saxatilis x chrysops (hybrid striped x white bass (wiper))

Percidae (Perches)
Ammocrypta pellucida (eastern sand darter)
Etheostoma blennioides (greenside darter)
Etheostoma caeruleum (rainbow darter)
Etheostoma camurum (bluebreast darter)
Etheostoma flabellare (fantail darter)
Etheostoma maculatum (spotted darter) (E)
Etheostoma microperca(least darter) (SC)
Etheostoma nigrum (johnny darter)
Etheostoma spectabile (orangethroat darter)
Etheostoma tippecanoe (tippecanoe darter) (T)
Etheostoma variatum (variegate darter)
Etheostoma zonale (banded darter)
Perca flavescens (yellow perch)
Percina caprodes (logperch darter)
Percina copelandi (channel darter) (T)
Percina maculate (blackside darter)
Percin phoxocephala (slenderhead darter)
Percina sciera (dusky darter)
Percina shumardi (river darter) (T)
Sander canadensis (sauger)
Sander canadensis x vitreus (hybrid sauger x walleye (saugeye))
Sander vitreus vitreus (walleye)

Percopsidae (Trout-Perch)
Percopsis omiscomaycus (trout-perch)

Petromyzontidae (Lamprey)
Ichthyomyzon unicuspis (silver lamprey)
Lampetra aepyptera (least brook lamprey)

Poeciliidae (Livebearers)
Gambusia affinis (western mosquitofish)

Polyodontidae (Paddle fish)
Polyodon spathula (paddlefish) (T)

Sciaenidae (Drum)
Aplodinotus grunniens (freshwater drum)

Amphibians and Reptiles. The following list of 25 amphibians and 24 reptiles have been recorded from the Paint Creek Wateshed. This list was compiled by Gregory Lipps, Amphibian and Reptile Conservation Coordinator for the Ohio Biodiversity Conservation Partnership at The Ohio State University, in 2020.

Anura (Frogs and Toads)

Bufonidae

Anaxyrus americanus americanus (eastern American toad)
Anaxyrus fowleri (Fowler's toad)

Hylidae

Acris blanchardi (Blanchard's cricket frog) (SC)
Hyla chrysoscelis (Cope's grey treefrog)
Hyla versicolor (gray treefrog)
Pseudacris brachyphona (mountain chorus frog)
Pseudacris crucifer (spring peeper)
Pseudacris triseriata (western chorus frog)

Ranidae

Lithobates catesbeianus (American bullfrog)
Lithobates clamitans (green frog)
Lithobates palustris (pickerel frog)
Lithobates pipiens (northern leopard frog)
Lithobates sylvaticus (wood frog)

Caudata (Salamanders)

Ambystomatidae

Ambystoma jeffersonianum (Jefferson salamander)
Ambystoma maculatum (spotted salamander)
Ambystoma opacum (marbled salamander)

Cryptobranchidae

Cryptobranchus alleganiensis alleganiensis (eastern hellbender) (E)

Plethodontidae

Desmognathus fuscus (northern dusky salamander)
Eurycea cirrigera (southern two-lined salamander)
Hemidactylium scutatum (four-toed salamander) (SC)
Gyrinophilus porphyriticus duryi (kentucky spring salamander)
Plethodon glutinosus (northern slimy salamander)
Plethodon richmondi (northern ravine salamander)

Proteidae

Eurycea longicauda (eastern long-tailed salamander)
Necturus maculosus maculosus (common mudpuppy)

Salmandridae

Notophthalmus viridescens (red-spotted newt)

Squamata (Lizards and Snakes)

Colubridae

Coluber constrictor (black racer)
Diadophis punctatus (northern ringneck snake)
Heterodon platirhinos (eastern hog-nosed snake) (SC)
Lampropeltis triangulum (eastern milksnake)
Nerodia sipedon sipedon (northern watersnake)
Pantherophis spiloides (black [gray] ratsnake)
Opheodrys aestivus (northern rough greensnake) (SC)
Regina septemvittata (queensnake) (SC)
Storeria dekayi (DeKay's northern brownsnake)
Storeria occipitomaculata (red-bellied snake)
Thamnophis sirtalis sirtalis (eastern gartersnake) (SC)
Virginia valeriae valeriae (eastern smooth earthsnake) (SC)

Scincidae

Plestiodon fasciatus (five-lined skink)
Plestiodon laticeps (broad-headed skink)

Viperidae

Agkistrodon contortrix (eastern copperhead)
Crotalus horridus (timber rattlesnake) (SC)

Testudines (Turtles)

Emydidae

Graptemys geographica (northern map turtle)
Graptemys ouachatensis (Ouachita map turtle) (SC)
Terrapene carolina carolina (woodland box turtle) (SC)

Chelydridae

Chelydra serpentine (common snapping turtle)

Kinosternidae

Sternotherus odoratus (eastern musk turtle)

Trionychidae

Apalone mutica mutica (smooth softshell)
Apalone spinifera spinifera (spiny Softshell)

Birds. The following is a list of 160 bird species identified as having some form of **breeding** evidence in the Paint Creek Watershed. List was compiled by Matthew B. Shumar, Program Coordinator of the Ohio Bird Conservation Initiative at The Ohio State University, School of Environmental and Natural Resources. It is adapted from the Second Atlas of Breeding Birds in Ohio (Rodewald et al., 2016).

Accipitridae (Hawks, Eagles and Kites)
Accipiter cooperii (Cooper's hawk)
Accipiter striatus (sharp-shinned hawk) (SC)
Buteo jamaicensis (red-tailed hawk)
Buteo lineatus (red-shouldered hawk)
Buteo platypterus (broad-winged hawk)
Circus hudsonius (northern harrier) (E)
Haliaeetus leucocoephalus (bald eagle)

Alaudidae (Larks)
Eremophila alpestris (horned lark)

Alcedinidae (Kingfishers)
Megaceryle alcyon (belted kingfisher)

Anatidae (Ducks, Geese, and Waterfowl)
Aix sponsa (wood duck)
Anas crecca (green-winged teal)
Anas platyrhynchos (mallard)
Branta Canadensis (Canada goose)
Cygnus olor (mute swan)
Lophodytes cucullatus (hooded merganser) (SI)
Oxyura jamaicensis (ruddy duck)
Spatula clypeata (northern shoveler)
Spatula discors (blue-winged teal)

Apodidae (Swifts)
Chaetura pelagica (chimney swift)

Ardeidae (Herons, Egrets and Bitterns)
Ardea alba (great egret) (SC)
Ardea herodias (great blue heron)
Botaurus lentiginosus (American bittern) (E)
Butorides virescens (green heron)
Egretta caerulea (little blue heron)
Ixobrychus exilis (least bittern) (T)

Bombycillidae (Waxwings)
Bombycilla cedrorum (cedar waxwing)

Caprimulgidae (Nightjars and Allies)
Antrostomus vociferus (eastern whip-poor-will) (SC)
Chordeiles minor (common nighthawk) (SC)

Cardinalidae (Cardinals and Allies)
Cardinalis cardinalis (northern cardinal)
Passerina caerulea (blue grosbeak)
Passerina cyanea (indigo bunting)
Pheucticus ludovicianus (rose-breasted grosbeak)
Piranga olivacea (scarlet tanager)
Piranga rubra (summer tanager)
Spiza americana (dickcissel)

Cathartidae (American Vultures)
Cathartes aura (turkey vulture)
Coragyps atratus (black vulture)

Certhiidae (Treecreepers)
Certhia americana (brown creeper) (SI)

Charadriidae (Plovers and Lapwings)
Charadrius vociferous (killdeer)

Columbidae (Pigeons and Doves)
Columbia livia (rock pigeon) (N/I)
Streptopelia decaocto (eurasian-collard dove) (N/I)
Zenaida macroura (mourning dove)

Corvidae (Crows, Jays and Magpies)
Corvus brachyrhynchos (American crow)
Cyanocitta cristata (blue jay)

Cuculidae (Cuckoos)
Coccyzus americanus (yellow-billed cuckoo)
Coccyzus erythropthalmus (black-billed cuckoo) (SC)

Falconidae (Falcons and Caracaras)
Falco sparverius (American kestrel)
Falco peregrinus (peregrine falcon)

Fringillidae (Finches, Euphonias and Allies)
Haemorhous mexicanus (house finch) (N/I)
Haemorhous purpureus (purple finch) (SI)
Spinus pinus (pine siskin)
Spinus tristis (American goldfinch)

Gruidae (Cranes)
Antigone canadensis (sandhill crane) (T)

Hirundinidae (Swallows)
Hirundo rustica (barn swallow)
Petrochelidon pyrrhonota (cliff swallow)
Progne subis (purple martin)
Riparia riparia (bank swallow)
Stelgidopteryx serripennis (northern rough-winged swallow)
Tachycineta bicolor (tree swallow)

Icteridae (Troupials and Allies)
Agelaius phoeniceus (red-winged blackbird)
Dolichonyx oryzivorus (bobolink) (SC)
Icterus spurius (orchard oriole)
Icterus galbula (baltimore oriole)
Molothrus ater (brown-headed cowbird)
Quiscalus quiscula (common grackle)
Sturnella magna (eastern meadowlark)

Icteriidae (Yellow-Breasted Chat)
Icteria virens (yellow-breasted chat)

Laniidae (Shrikes)
Lanius ludovicianus (loggerhead shrike) (E)

Laridae (Gulls, Terns and Skimmers)
Larus delawarensis (ring-billed gull)
Larus argentatus (herring gull)

Mimidae (Mockingbirds and Thrashers)
Dumetella carolinensis (gray catbird)
Mimus polyglottos (northern mockingbird)
Toxostoma rufum (brown thrasher)

Odontophoridae (New World Quail)
Colinus virginianus (northern bobwhite) (SC)

Pandionidae (Osprey)
Pandion haliaetus (osprey)

Paridae (Tits, Chickadees and Titmice)
Baeolophus bicolor (tufted titmouse)
Poecile atricapillus (black-capped chickadee)
Poecile carolinensis (carolina chickadee)

Parulidae (New World Warblers)
Geothlypis formosa (kentucky warbler)
Geothlypis trichas (common yellowthroat)
Helmitheros vermivorum (worm-eating warbler)
Mniotilta varia (black-and-white warbler)
Parkesia motacilla (Louisiana waterthrush) (SI)
Protonotaria citrea (prothonotary warbler) (SC)
Seiurus aurocapilla (ovenbird)
Setophaga americana (northern parula)
Setophaga cerulea (cerulean warbler) (SC)
Setophaga citrina (hooded warbler)
Setophaga discolor (prairie warbler)
Setophaga dominica (yellow-throated warbler)
Setophaga magnolia (magnolia warbler) (SI)
Setophaga pensylvanica (chestnut-sided warbler)
Setophaga petechia (yellow warbler)
Setophaga pinus (pine warbler)
Setaphaga ruticilla (American redstart)
Setophaga virens (black-throated green warbler) (SI)
Vermivora cyanoptera (blue-winged warbler)

Passerellidae (New World Sparrows)
Ammodramus savannarum (grasshopper sparrow) (SC)
Centronyx henslowii (henslow's sparrow) (SC)
Chondestes grammacus (lark sparrow) (E)
Melospiza georgiana (swamp sparrow)
Melospiza melodia (song sparrow)
Passerculus sandwichensis (savannah sparrow)
Pipilo erythrophthalmus (eastern towhee)
Pooecetes gramineus (vesper sparrow) (SC)
Spizella passerine (chipping sparrow)
Spizella pusilla (field sparrow)
Zonotrichia albicollis (white-throated sparrow)

Passeridae (Old World Sparrows)
Passer domesticus (house sparrow)

Phalacrocoracidae (Cormorants and Shags)
Phalacrocorax auritus (double-crested cormorant)

Phasianidae (Pheasants, Grouse and Allies)
Bonasa umbellus (ruffed grouse) (SC)
Meleagris gallopavo (wild turkey)
Phasianus colchicus (ring-necked pheasant) (N/I)

Picidae (Woodpeckers)
Colaptes auratus (northern flicker)
Dryobates pubescens (downy woodpecker)
Dryobates villosus (hairy woodpecker)
Dryocopus pileatus (pileated woodpecker)
Melanerpes carolinus (red-bellied woodpecker)
Melanerpes erythrocephalus (red-headed woodpecker) (SC)

Podicipedidae (Grebes)
Podilymbus Podiceps (pied-billed grebe)

Polioptilidae (Gnatcatchers)
Polioptila caerulea (blue-gray gnatcatcher)

Rallidae (Rails, Gallinules and Coots)
Fulica americana (American coot)
Rallus elegans (king rail) (E)
Rallus limicola (Virginia rail) (SC)
Porzana Carolina (sora) (SC)
Gallinula galeata (common gallinule) (SC)

Recurvirostridae (Stilts and Avocets)
Himantopus mexicanus (black-necked stilt)

Regulidae (Kinglets)
Regulus satrapa (golden-crowned kinglet)

Scolopacidae (Sandpipers and Allies)
Actitis macularius (spotted sandpiper)
Bartramia longicauda (upland sandpiper) (E)
Gallinago delicata (Wilson's snipe) (SI)
Scolopax minor (American woodcock)

Sittidae (Nuthatches)
Sitta carolinensis (white-breasted nuthatch)

Strigidae (Owls)
Bubo virginianus (great horned owl)
Megascops asio (eastern screech-owl)
Strix varia (barred owl)

Sturnidae (Starlings)
Sturnus vulgaris (european starling) (N/I)

Trochilidae (Hummingbirds)
Archilochus colubris (ruby-throated hummingbird)

Troglodytidae (Wrens)
Cistothorus platensis (sedge wren) (SC)
Thryothorus ludovicianus (carolina wren)
Troglodytes aedon (house wren)
Troglodytes hiemalis (winter wren) (SI)

Turdidae (Thrushes)
Catharus fuscescens (veery) (SI)
Hylocichla mustelina (wood thrush)
Sialia sialis (eastern bluebird)
Turdus migratorius (American robin)

Tyrannidae (Tyrant Flycatchers)
Contopus virens (eastern wood-pewee)
Empidonax virescens (acadian flycatcher)
Empidonax traillii (willow flycatcher)
Empidonax minimus (least flycatcher) (SI)
Myiarchus crinitus (great crested flycatcher)
Sayornis phoebe (eastern phoebe)
Tyrannus tyrannus (eastern kingbird)

Tytonidae (Barn-Owls)
Tyto alba (barn owl) (T)

Vireonidae (Vireos, Shrike-Babblers and Erpornis)
Vireo bellii (bell's vireo) (SI)
Vireo flavifrons (yellow-throated vireo)
Vireo gilvus (warbling vireo)
Vireo griseus (white-eyed vireo)
Vireo olivaceus (red-eyed vireo)

Migrating Birds. In addition to the bird species listed above that have been documented as having exhibited some breeding activity in the Paint Creek Watershed, the following species have been documented to occur in Highland and/or Ross Counties. Highland and Ross Counties contain the sections of Paint Creek, North Fork Paint Creek, Rocky Fork Paint Creek and Rattlesnake Creek currently proposed for scenic river designation. List compiled from Cornell Lab of Ornithology (ebird.org).

Accipitridae (Hawks, Eagles and Kites)
Aquila chrysaetos (golden eagle)
Buteo lagopus (rough-legged hawk)
Elanoides forficatus (swallow-tailed kite)
Ictinia mississippiensis (Mississippi kite)

Anatidae (Ducks, Geese, Swans)
Anas acuta (northern pintail)
Anas rubripes (American black duck)
Anser caerulescens (snow goose)
Anser rossii (Ross's goose)
Anser albifrons (greater white-fronted goose)
Aythya affinis (lesser scaup)
Aythya americana (redhead)
Aythya collaris (ring-necked duck)
Aythya marila (greater scaup)
Aythya valisineria (canvasback)
Branta bernicla (brant)
Branta hutchinsii (cackling goose)
Bucephala albeola (bufflehead)
Bucephala clangula (common goldeneye)
Clangula hyemalis (long-tailed duck)
Cygnus buccinator (trumpeter swan)
Cygnus columbianus (tundra swan)
Mareca strepera (gadwall)
Mareca americana (American wigeon)
Melanitta americana (black scoter)
Melanitta deglandi (white-winged scoter)
Melanitta perspicillata (surf scoter)
Mergus merganser (common merganser)
Mergus serrator (red-breasted merganser)

Ardeidae (Bitterns, Herons)
Bubulcus ibis (cattle egret)
Egretta thula (snowy egret)
Nycticorax nycticorax (black-crowned night-heron) (T)
Plegadis chihi (white-faced ibis)

Calcariidae (Longspurs and Snow Buntings)
Calcarius lapponicus (Lapland longspur)
Plectrophenax nivalis (snow bunting)

Caprimulgidae (Nightjars and Allies)
Antrostomus carolinensis (Chuck-will's-widow)

Cardinalidae (Cardinals and Allies)
Passerina ciris (painted bunting)

Charadriidae (Plovers and Lapwings)
Charadrius melodus (piping plover)
Charadrius semipalmatus (semipalmated plover)
Pluvialis dominica (American golden plover)
Pluvialis squatarola (black-bellied plover)

Corvidae (Crows, Jays and Magpies)
Corvus ossifragus (fish crow)

Falconidae (Falcons, Caracaras)
Falco columbarius (merlin)

Fringillidae (Finches, Euphonias and Allies)
Acanthis flammea (common redpoll)
Coccothraustes vespertinus (evening grosbeak)

Gaviidae (Loons)
Gavia immer (common loon)
Gavia stellata (red-throated loon)

Hirundinidae (Swallows)
Petrochelidon fulva (cave swallow)

Icteridae (Troupials and Allies)
Euphagus carolinus (rusty blackbird)
Euphagus cyanocephalus (Brewer's Blackbird)

Laniidae (Shrikes)
Lanius borealis (northern shrike)

Motacillidae (Wagtails and Pipits)
Anthus rubescens (American pipit)

Laridae (Gulls, Terns and Skimmers)
Chlidonias niger (black tern)
Chroicocephalus Philadelphia (Bonaparte's gull)
Hydrocoloeus minutus (little gull)
Hydroprogne caspia (Caspian tern)
Leucophaeus pipixcan (Franklin's gull)
Sterna forsteri (Forster's tern)
Sterna hirundo (common tern)

Parulidae (New World Warblers)
Cardellina canadensis (Canada warbler)
Cardellina pusilla (Wilson's warbler)
Geothlypis philadelphia (mourning warbler)
Leiothlypis celata (orange-crowned warbler)
Leiothlypis peregrina (Tennessee warbler)
Leiothlypis ruficapilla (Nashville warbler)
Oporornis agilis (Connecticut warbler)

Parkesia noveboracensis (northern waterthrush)
Setophaga caerulescens (black-throated blue warbler)
Setophaga castanea (bay-breasted warbler)
Setophaga coronate (yellow-rumped warbler)
Setophaga fusca (blackburnian warbler)
Setophaga palmarum (palm warbler)
Setophaga striata (blackpoll warbler)
Setophaga tigrina (cape may warbler)
Vermivora chrysoptera (golden-winged warbler)

Passerellidae (New World Sparrows)
Ammospiza leconteii (LeConte's sparrow)
Junco hyemalis (dark-eyed junco)
Melospiza lincolnii (Lincoln's sparrow)
Passerella iliaca (fox sparrow)
Spizella arborea (American tree sparrow)
Spizella pallida (clay-colored sparrow)
Zonotrichia leucophrys (white-crowned sparrow)

Pelecanidae (Pelicans)
Pelecanus erythrorhynchos (American white pelican)

Picidae (Woodpeckers)
Sphyrapicus varius (yellow-bellied sapsucker)

Podicipedidae (Grebes)
Podiceps auratus (horned grebe)
Podiceps grisegena (red-necked grebe)
Podiceps nigricollis (eared grebe)

Recurvirostridae (Stilts and Avocets)
Recurvirostra americana (American avocet)

Regulidae (Kinglets)
Regulus calendula (ruby-crowned kinglet)

Scolopacidae (Sandpipers and Allies)
Calidris alpina (dunlin)
Calidris mauri (western sandpiper)
Calidris melanotos (pectoral sandpiper)
Calidris minutilla (least sandpiper)
Calidris pusilla (semipalmated sandpiper)
Calidris subruficollis (buff-breasted sandpiper)
Limnodromus griseus (short-billed dowitcher)
Phalaropus lobatus (red-necked phalarope)
Phalaropus tricolor (Wilson's phalarope)
Tringa flavipes (lesser yellowlegs)
Tringa melanoleuca (greater yellowlegs)
Tringa semipalmata (willet)
Tringa solitaria (solitary sandpiper)

Sittidae (Nuthatches)
Sitta canadensis (red-breasted nuthatch)

Strigidae (Owls)
Aegolius acadicus (northern saw-whet owl)
Asio flammeus (short-eared owl)
Asio otus (long-eared owl)
Bubo scandiacus (snowy owl)

Threskiornithidae (Ibises and Spoonbills)
Platalea ajaja (roseate spoonbill)

Trochilidae (Hummingbirds)
Selasphorus calliope (calliope hummingbird)
Selasphorus rufus (rufous hummingbird)

Troglodytidae (Wrens)
Cistothorus palustris (marsh wren)

Turdidae (Thrushes)
Catharus guttatus (hermit thrush)
Catharus minimus (gray-cheeked thrush)
Catharus ustulatus (Swainson's thrush)

Tyrannidae (Tyrant Flycatchers)
Contopus cooperi (olive-sided flycatcher)
Empidonax alnorum (alder flycatcher)
Empidonax flaviventris (yellow-bellied flycatcher)

Vireonidae (Vireos, Shrike-Babblers and Erpornis)
Vireo philadelphicus (Philadelphia vireo)
Vireo solitarius (blue-headed vireo)

Mammals. The following is a list of mammals likely found in the Paint Creek watershed based on ODNR Division of Wildlife range maps (Ohio Department of Natural Resources, Division of Wildlife, *Mammals of Ohio* field guide).

Carnivora (Carnivores)

Felidae
Lynx rufus (bobcat)

Canidae
Canis latrans (coyote)
Vulpes vulpes (red fox)
Urocyon cinereoargenteus (gray fox) (SC)

Ursidae
Ursus americanus (American black bear) (E)

Mustelidae
Lontra canadensis (North American river otter)
Mustela frenata (long-tailed weasel)
Mustela nivalis (least weasel)
Neovison vison (American mink)
Taxidea taxus (American badger) (SC)

Mephitidae
Mephitis mephitis (striped skunk)

Procyonidae
Procyon lotor (Raccoon)

Artiodactyla (Ungulates)

Cervidae
Odocoileus virginianus (white-tailed deer)

Chiroptera (Winged)

Vespertilionidae
Myotis lucifugus (little brown bat) (SC)
Myotis septentrionalis (northern long-eared bat) (E) (FE)
Myotis sodalis (Indiana bat) (E) (FE)
Perimyotis subflavus (tri-colored bat) (SC)
Eptesicus fuscus (big brown bat) (SC)
Nycticeius humeralis (evening bat) (SI)
Lasiurus borealis (eastern red bat) (SC)
Lasiurus cinereus (hoary bat) (SC)
Lasionycteris noctivagans (silver-haired bat) (SC)

Didelphimorphia (Marsupial)

Didelphidae
Didelphis virginiana (Virginia opossum)

Insectivora (Insectivores)

Soricidae
Sorex cinereus (masked shrew)
Cryptotis parva (North American least shrew)
Sorex fumeus (smoky shrew) (SC)
Sorex hoyl (American pygmy shrew) (SC)
Blarina brevicauda (northern short-tailed shrew)

Talpidae
Scalopus aquaticus (eastern mole)
Parascalops breweri (hairy-tailed mole)

Lagomporpha (Hares and Rabbits)

Leporidae
Sylvilagus floridanus (eastern cottontail)

Rodentia (Rodents)

Sciuridae
Tamias striatus (eastern chipmunk)
Spermophilus tridecemlineatus (thirteen lined ground squirrel)
Sciurus carolinensis (eastern gray squirrel)
Sciurus niger (fox squirrel)
Glaucomys Volans (southern flying squirrel)
Marmota monax (woodchuck)

Castoridae
Castor canadensis (American beaver)

Cricetidae
Reithrodontomys humulis (eastern harvest mouse) (T)
Peromyscus maniculatus (North American deermouse) (SC)
Peromyscus leucopus (white-footed deermouse)
Microtus pennsylvanicus (meadow vole)
Microtus pinetorum (woodland vole) (SC)
Microtus ochrogaster (prairie vole) (SC)
Synaptomys cooperi (southern bog lemming) (SC)
Ondatra zibethicus (common muskrat)

Muridae
Rattus norvegicus (brown rat)
Mus musculus (house mouse)

Dipodidae
Zapus hudsonius (meadow jumping mouse)

Paint Creek Report

The following description of Paint Creek and its tributaries was developed from existing resources, ODNR Division of State Parks Where to Paddle sites (2018), 2016 aerial imagery, and 2018 field inspections. This includes access points as well as locations of significant stream information, landmarks, and natural features. Locations are based on river miles digitized by Ohio EPA on 7.5-minute U.S. Geological Survey topographic maps from the 1980s. River miles are based on the measured distance upstream from the mouth of any river or stream with the mouth of the stream being RM 0.0. For Paint Creek and Upper Paint Creek, RM 0.0 is located at its confluence with Scioto River, and RM 12.5 on Paint Creek is 12.5 miles upstream from the mouth of Paint Creek at its confluence with Scioto River. For North Fork Paint Creek and Rocky Fork Creek, RM 0.0 is located at their respective confluences with Paint Creek. Figure 31 shows the location of access points and significant locations included in the report. The terminology, *river left* and *river right*, refer to the left-hand or right-hand side of the river channel when facing downstream.

Three liveries provide canoes and kayaks for recreation:

1. Waters Edge Canoe Livery, 10807 State Route 772, Chillicothe, OH 45601, (740) 779-3339
   All floates end at the livery between river miles 9.9 and 10. Floats begin at three locations: Blain Highway bridge at river mile 16.4 (6 mi), Jones Levee bridge at river mile 21.6 (11 mi), and Highway 50 bridge at river mile 28.7 (19 mi).

2. Paint Creek Rental, 14000 U.S. Route 50 West, Chillicothe, OH 45601, (740) 701-6001
   All floats end at the livery at river mile 16.9. Floats begin at three locations: Jones Levee bridge at river mile 21.6 (6 mi), Copperas Mountain at river mile 26.6 (12 mi), and Seip Mound at river mile 27.8 (16 mi).

3. Shawnee Valley Campground and Kayak Rental, 307 Alum Cliff Road, Chillicothe, OH, 45601, (740) 701-8765
   All floatss end at the livery between river miles 8.9 and 9.0. There are four different floats: Alum Cliff Road at river mile 11.8-11.9 (3 mi), from Highway 50 near river mile 17.0-17.1 (8 mi), Copperas Mountain at river mile 26.6 (16 mi), and near Bainbridge (22 mi).

River Miles for each Access Point are provided in green. Access at points noted at bridges is provided through the public right of way associated with the bridge crossing. Walking upstream or downstream from a roadside access may constitute trespassing on private property. River Miles for other significant points of interest are in red (e.g., bridges with no access, natural features, portage information, etc.). Some of the dams have access points associated with them.

Paint Creek

1. RM 3.8 State Route 772/Paint St. bridge in Chillicothe, roadside access river right.
   GPS 39.3198, -82.9790

2. RM 5.7 Significant forested wetland. Private property - no access (RM 5.3-6.2).
   GPS 39.3128, -82.9981

3. RM 7.5 Junction Earthworks river left.
   GPS 39.3131, -83.0147

4. RM 8.1 Confluence of Paint Creek and North Fork Paint Creek on river left.
   GPS 39.3134, -83.0260

5. RM 13.5 Enter Natural Heritage Managed Area - Earl H Barnhart Buzzards Roost Nature Preserve, Ross County Park District (also know as The Narrows) (RM 11.5-15.0).
   GPS 39.3207, -83.0783

6. RM 16.4 Blain Highway Bridge. Private property - no access.
   GPS 39.3078, -83.1185

7. RM 18.9 Spruce Hill Earthwork on river right - no access without permit.
   GPS 39.2824, -83.1405

8. RM 19.0 Natural Heritage Location - geologic outcrop of Ohio Shale.
   GPS 39.2800, -83.1420

9. RM 21.4 Baum Earthworks on river right. Private property - no access.
   GPS 39.2649, -83.1635

10. RM 21.6 Jones Levee Bridge - access on river left.
    GPS 39.2631, -83.1672

11. RM 26.4 Natural Heritage Conservation Site, Copperas Mountain and outcrop of Ohio Shale on river right, access river right.
    GPS 39.2325, -83.1980

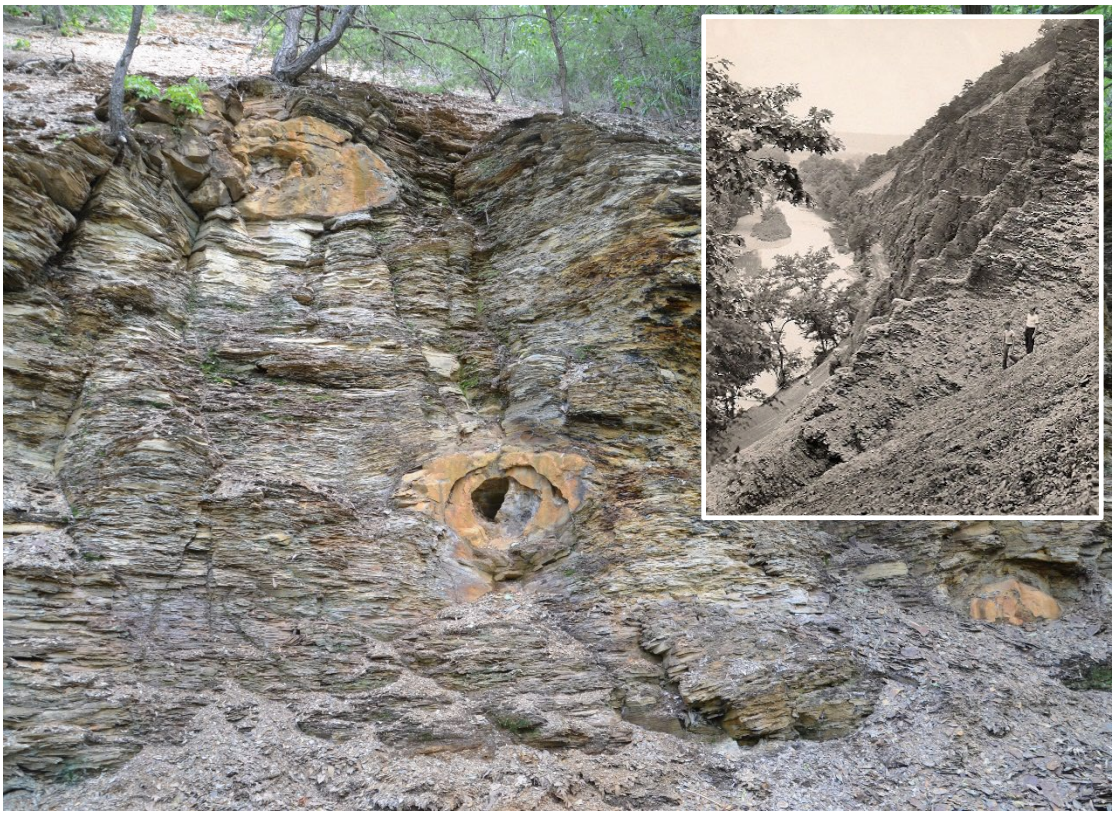

Figure 27. Outcrop of Ohio Shale, thinly bedded black shales greater than 300 feet thick at this section at RM 26.4 on Paint Creek. The Ohio Shale is known for spherical iron concretions, three of which are visible in the photo. The inset shows the outcrop along an outside bend of Paint Creek where erosion maintains the outcrop exposure. Inset photo is courtesy of the Ross County Historical Society.

12. RM 27.8 Access to Seip Earthworks, river left.
GPS 39.2307, -83.2228

13. RM 27.9 Natural Heritage Conservation Site - Little Copperas Mountain.
GPS 39.2302, -83.2245

14. RM 28.7 S.R. 50 bridge east of Bainbridge with parking about 1/8 mile east at Seip Mound State Memorial, roadside access river right and left.
GPS 39.2398, -83.2288

15. RM 31.5 Quarry Street bridge, State Route 41, in Bainbridge, roadside access river right.
GPS 39.2348, -83.2723

16. RM 33.2 Falls - Paint Creek Falls about 1 mile downstream from the State Route 50 rest stop west of Bainbridge. One chute on river right is passable if not obstructed; approach with caution, portage river right with permission.
GPS 39.2288, -83.2934

17. RM 36.1 Roadside rest stop off State Route 50 on Blair Road one mile below Rapid Forge Road west of Bainbridge, access river right.
GPS 39.2320, -83.3270

Figure 28. Fisherman on Paint Creek Falls in 1989. Photo Courtesy of Ross County Historical Society.

18. RM 36.8 Paint Creek rapids just below Rapid Forge Road bridge west of Bainbridge, Class 2-3, portage river right if necessary; dangerous at high water for novices.
GPS 39.2346, -83.3389

19. RM 36.9 Rapid Forge Road: bridge.
GPS 39.2346, -83.3403

20. RM 38.8 Paint Creek Lake State Park, access river right below dam.
GPS - 39.2523, -83.3471

21. Paint Creek Lake State Park - Deer Park Road Boat Ramp and Marina, access or portage river right for Lake dam and spillway.
GPS 39.2440, -83.3550

22. Paint Creek Lake dam and spillway, portage river right at Deer Park Road Boat Ramp and Marina.
GPS 39.2470, -83.3520

23. RM 46.2 Enter impounded area of Paint Creek Lake.
GPS 39.2985, -83.3831

24. RM 46.7 Enter Natural Heritage Managed Area - Paint Creek Wildlife Area (RM 44.0-49.4).
GPS 39.3405, -83.3807

25. RM 50.0 Baltimore and Ohio Railroad bridge.
GPS 39.3469, -83.3754

26. RM 50.3 Felson Park, Greenfield, access river right.
GPS 39.3508, -83.3770

27. RM 50.4 State Route 41 bridge
GPS 39.3529, -83.3774

28. RM 51.2 Dam about 1 mile upstream of the State Route 28 bridge off Island Grove Road in Greenfield, portage river right or left, whichever is best at the water level.
GPS - 39.3630, -83.3769

29. RM 52.4 State Route 753 bridge, north of Greenfield, roadside access river right.
GPS - 39.3792, -83.3755

North Fork Paint Creek

30. RM 0.0 Plyley's Lane Road bridge in Chillicothe at mouth of North Fork flowing into the main branch of Paint Creek, access river left.
GPS 39.3140, -83.0266

31. RM 1.1 Steel Earthworks owned and managed by Highland Nature Sanctuary, Arc of Appalachia - river left. No access from river.
GPS 39.3254, -83.0351

32. RM 2.3 Polk Hollow Rd.
GPS 39.3368, -83.0366

33. RM 3.7 Entering Earl H Barnhart Buzzards Roost Nature Preserve.
GPS 39.3484, -83.0534

34. RM 3.8 State Route 50 bridge behind store in Slate Mills, access river right with permission.
GPS 39.3505, -83.0531

35. RM 5.9 Maple Grove Prairie, Ross County Parks District, river left - no direct river access.
GPS 39.3569, -83.0746

36. RM 6.6 Maple Grove Road bridge - river left access.
GPS 39.3587, -83.0831

Figure 29. View of North Fork Paint Creek at RM 6.7 from Maple Grove Road bridge, looking toward the Paint Creek Recreational Trail, which runs along the creek at this section, and the Hopewell Mound Group beyond the trail.

37. RM 6.7 Hopewell Mound Group - National Park Service, river left. No direct river access.
GPS 39.3595, -83.0851

38. RM 9.0 Paint Creek Recreational Trail (Tri-County Triangle Trail) bridge.
GPS 39.3612, -83.1173

39. RM 9.9 Paint Creek Recreational Trail (Tri-County Triangle Trail) bridge.
GPS 39.3651, -83.1327

40. RM 10.9 Paint Creek Recreational Trail (Tri-County Triangle Trail) bridge.
GPS 39.3709, -83.1461

41. RM 14.4 Westfall Road/Main Sreet Frankfort.
GPS 39.3987, -83.1825

42. RM 17.5 Dexter Road bridge south of Austin, roadside access river right and left.
GPS 39.4241,-83.2146

43. RM 18.6 State Route 138 bridge, Austin.
GPS 39.4366, -83.2228

44. RM 19.8 Paint Creek Recreational Trail (Tri-County Triangle Trail) bridge.
GPS 39.4512, -83.2332

45. RM 20.1 Plano Road bridge north of Austin, roadside access river right.
GPS 39.4550, -83.2320

46. RM 20.2 U.S. Highway 35 bridge.
GPS 39.4567, -83.2324

47. RM 23.3 Woodrow Road bridge east of Plano, roadside access river right.
GPS 39.4900, -83.2529

48. RM 25.1 Dogtown Road bridge.
GPS 39.5053, -83.2734

Rocky Fork Creek

49. RM 0.2 U.S. Highway 50 bridge
GPS 39.2309, -83.3469

50. RM 0.3 Natural Heritage Managed Area - leave Etawah Woods State Nature Preserve, part of Highlands Nature Sanctuary.
GPS 39.2296, -83.3472

51. RM 1.0 Natural Heritage Data - Cave (no access from river).
GPS - 39.2236, -83.3565

52. RM 1.0 Natural Heritage Data - Cave (no access from river).
GPS 39.2234, -83.3568

53. RM 1.0 Natural Heritage Data - Cave (no access from river).
GPS 39.2234, -83.3569

54. RM 1.0 Natural Heritage Data - Cave (no access from river).
GPS 39.2234, -83.3570

55. RM 1.0 Natural Heritage Data - Cave (no access from river).
GPS 39.2235, -83.3571

56. RM 1.1 Natural Heritage Data - Cave (no access from river).
GPS 39.2244, -83.3574

57. RM 1.1 Natural Heritage Data - Cave (no access from river).
GPS 39.2234, -83.3587

58. RM 1.6 Natural Heritage Data - Cave (no access from river).
GPS 39.2228, -83.3649

59. RM 3.0 Browning Road bridge.
GPS 39.2183, -83.3856

60. RM 3.7 Natural Heritage Data - natural arch in Miller Nature Sanctuary.
GPS 39.2116, -83.3879

61. RM 4.0 Natural Heritage Data - natural arch in Miller Nature Sanctuary.
GPS 39.2078, -83.3884

62. RM 4.4 Barretts Mill dam at Cave Road and Barretts Mill Road, portage river left with permission.
GPS 39.2020, -83.3880

63. RM 4.5 Barrett Mill Road bridge.
GPS 39.2009 -83.3877

64. RM 7.6 Beaver Mill Dam, portage river left (difficult portage).
GPS 39.1779, -83.4148

65. RM 7.7 Intersection of Spargur Lane Road and State Route 753, roadside access river right.
GPS 39.1776, -83.4149

66. RM 7.7 State Route 753 bridge.
GPS 39.1776, -83.4151

67. RM 9.1 McCoppin Mill Road bridge.
GPS 39.1827, -83.4374

68. RM 9.1 McCoppin Mill Road bridge, roadside access river right.
GPS 39.1826, -83.4376

Figure 30. View of Rocky Fork Dam, a run-of-river dam forming Rocky Fork Lake, in the background, and the McCoppin Dam, a mill dam for the McCoppin Mill on Rocky Fork Creek at RM 9.1.

69. RM 9.2 McCoppin Dam, downstream of Rocky Fork Lake Dam, access river left below dam.
GPS 39.3289, -83.4382

Rattlesnake Creek

70. RM 4.0 State Route 138 bridge.
GPS 39.2905, -83.4553

71. RM 7.8 Centerfield Road bridge. From this point downstream to Paint Creek Lake, the riparian corridor on both sides of Rattlesnake Creek is part of Paint Creek State Park.
GPS 39.3140, -83.4742

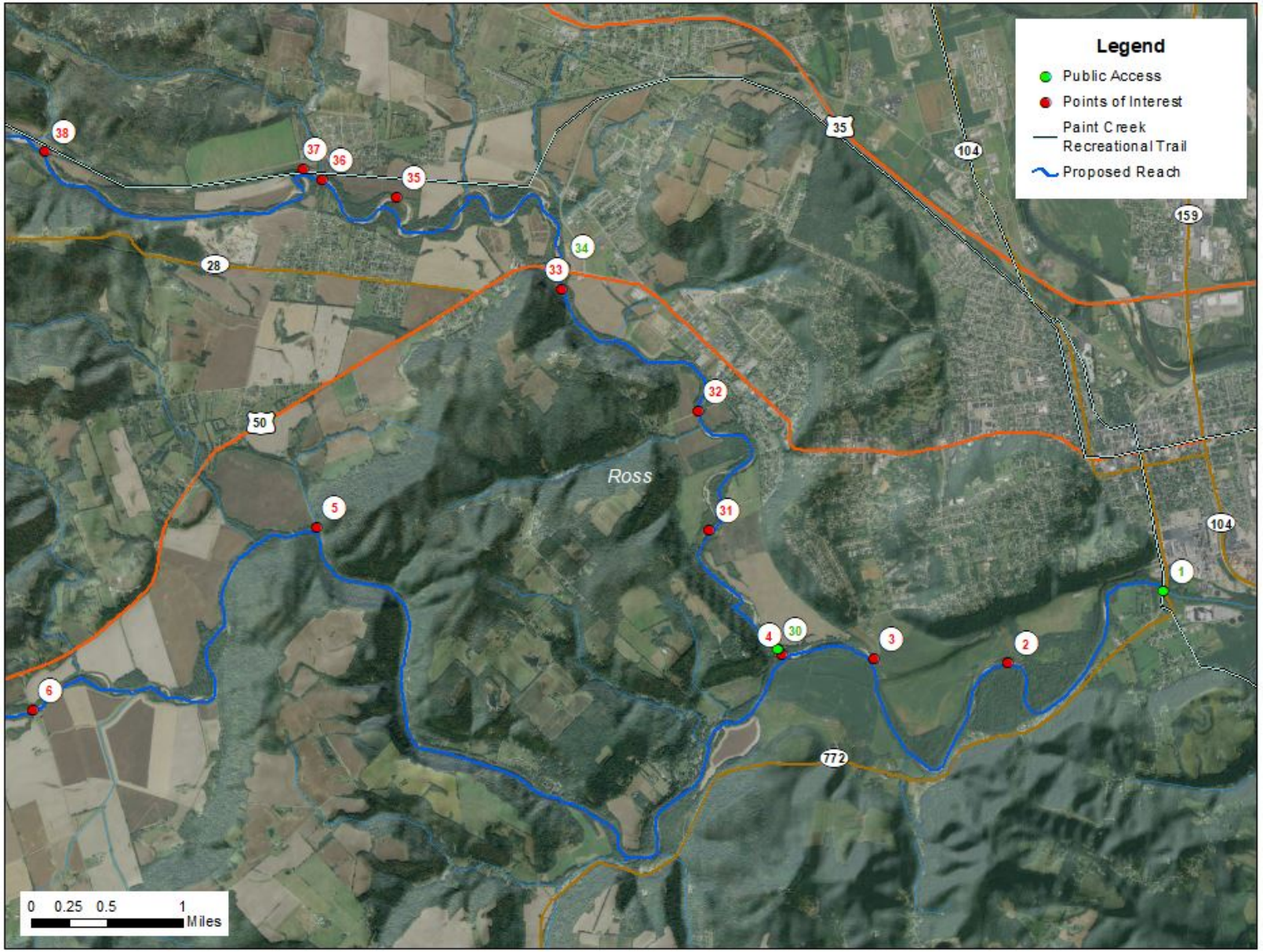

Figure 31a. Access points (green) and other points of interest (red), including major road crossings, recreational features, and natural features on lower Paint Creek and lower North Fork Paint Creek. Numbers are keyed to the Paint Creek report text above.

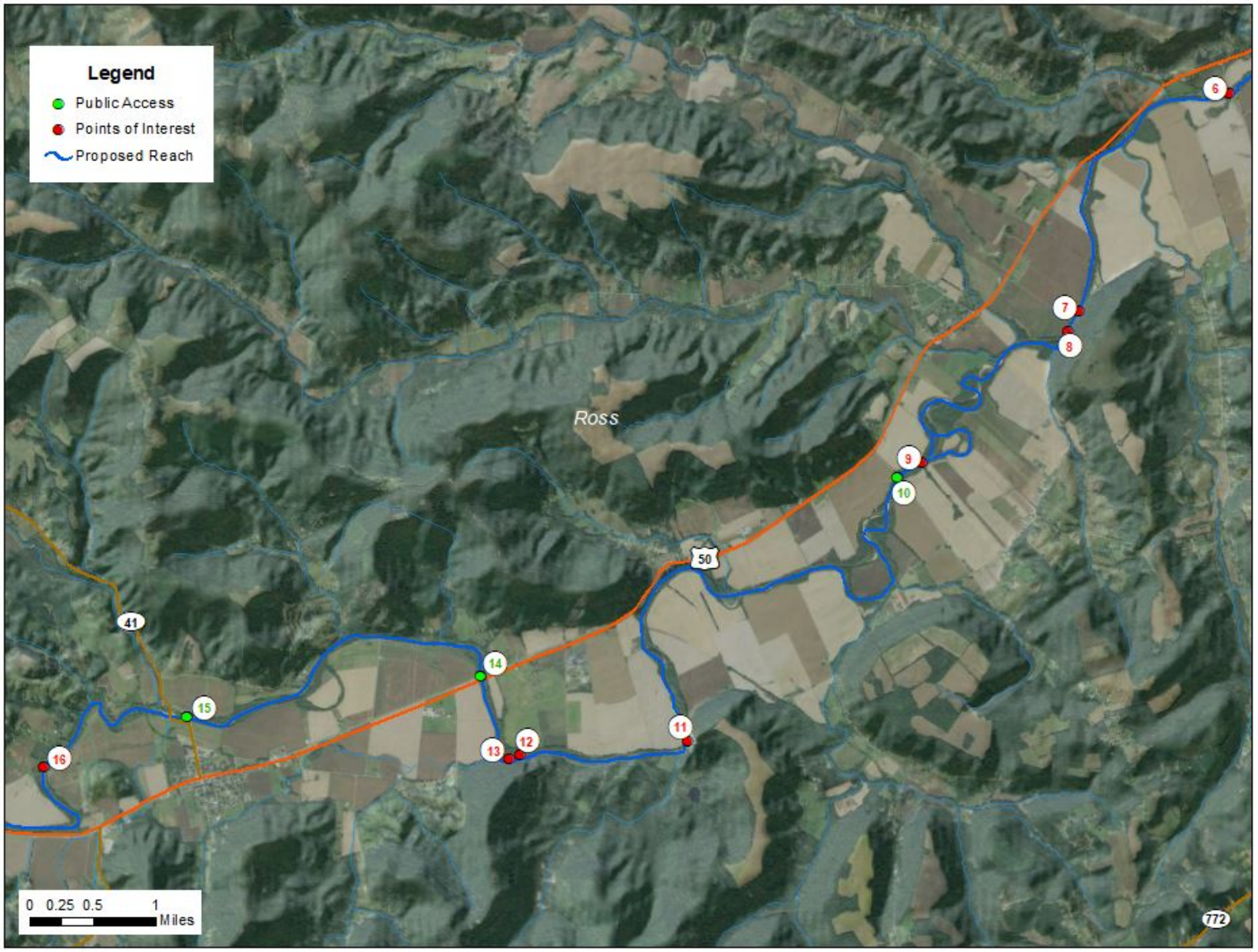

Figure 31b. Access points (green) and other points of interest (red), including major road crossings, recreational features, and natural features on Paint Creek, between North Fork Paint Creek and Rocky Fork Creek. Numbers are keyed to the Paint Creek report text above.

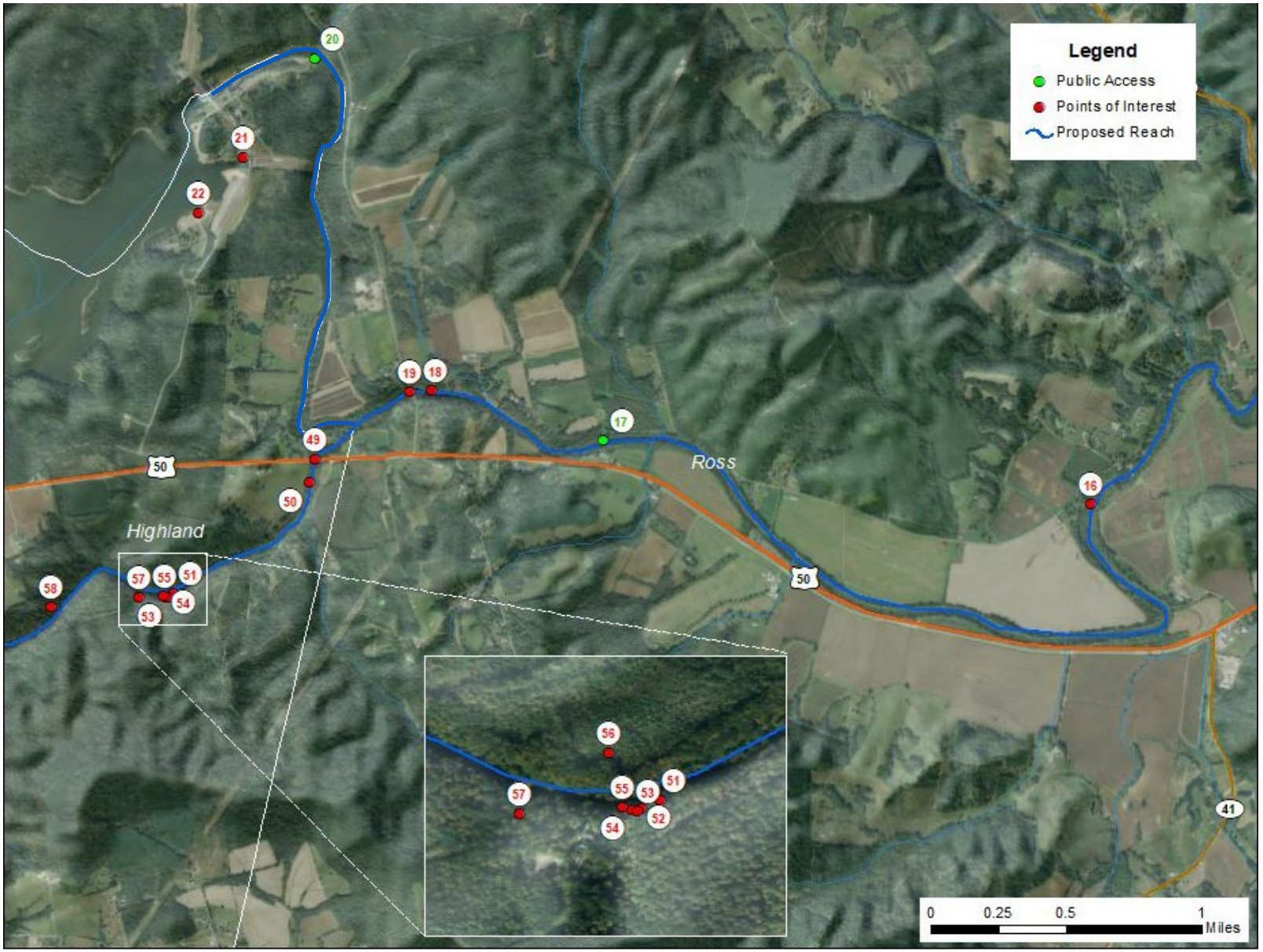

Figure 31c. Access points (green) and other points of interest (red), including major road crossings, recreational features, and natural features on Paint Creek and Rocky Fork Creek. Numbers are keyed to the Paint Creek report text above.

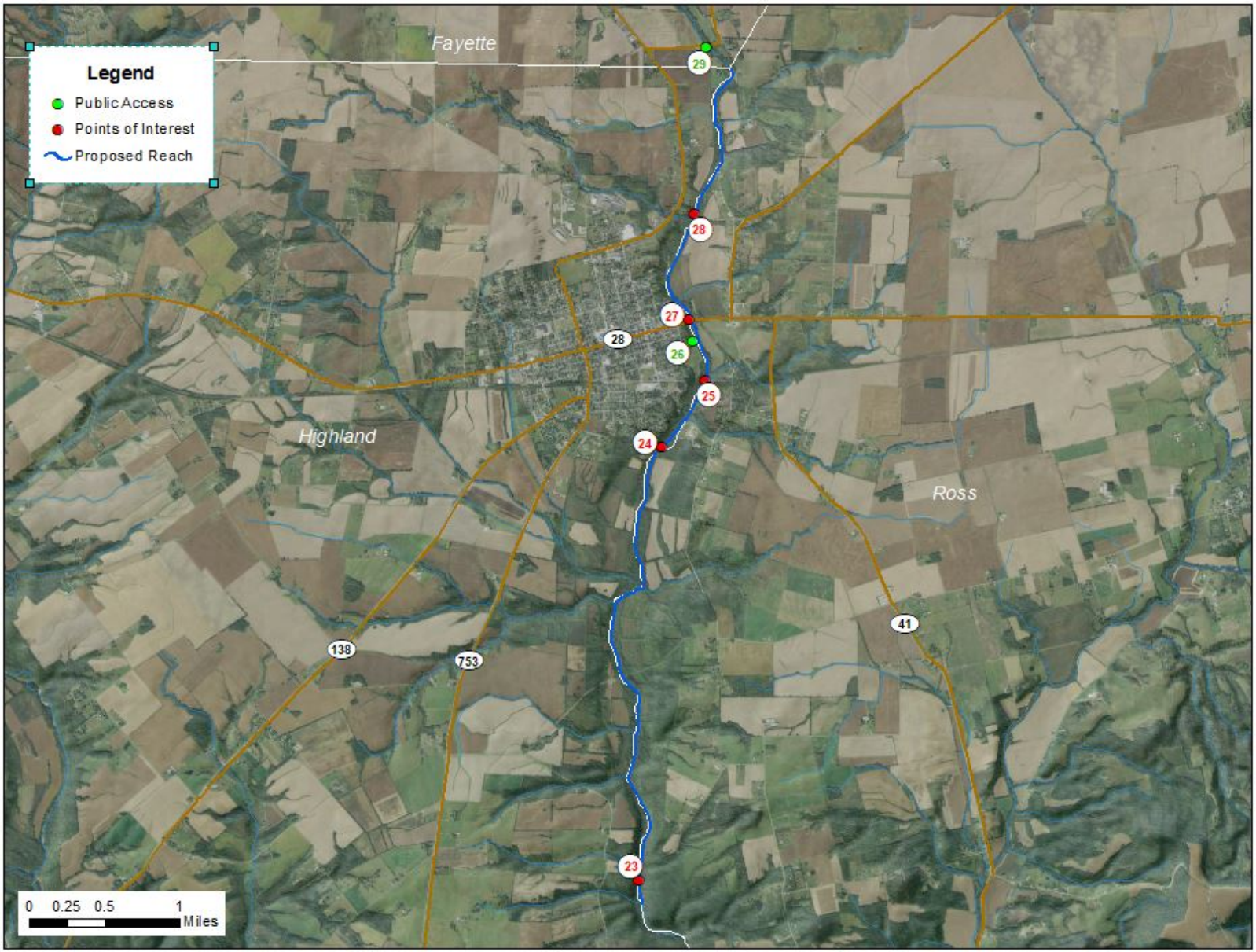

Figure 31d. Access points (green) and other points of interest (red), including major road crossings, recreational features, and natural features on Upper Paint Creek, upstream of Paint Creek Lake. Numbers are keyed to the Paint Creek report text above.

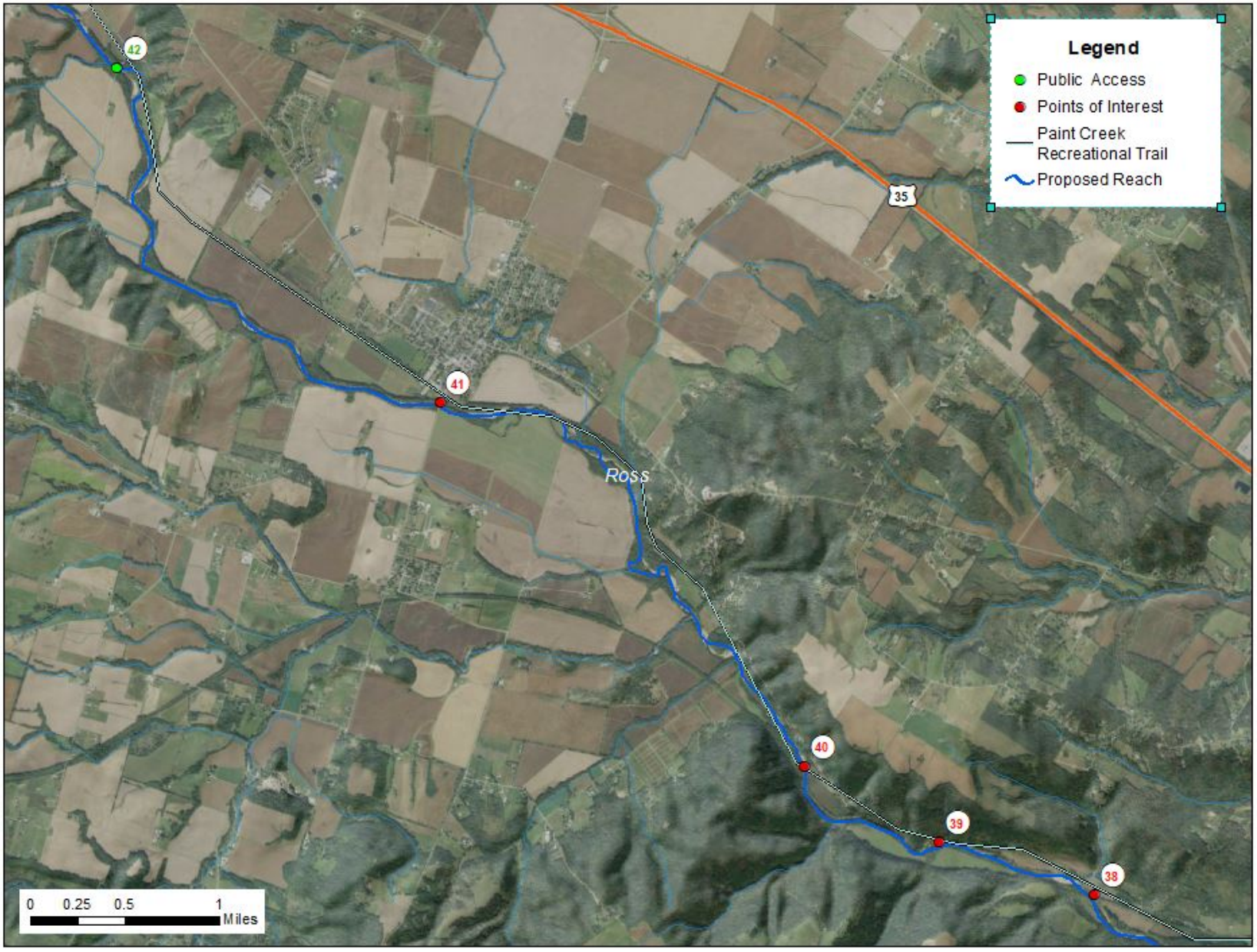

Figure 31e. Access points (green) and other points of interest (red), including major road crossings, recreational features, and natural features on upper North Fork Paint Creek. Numbers are keyed to the Paint Creek report text above.

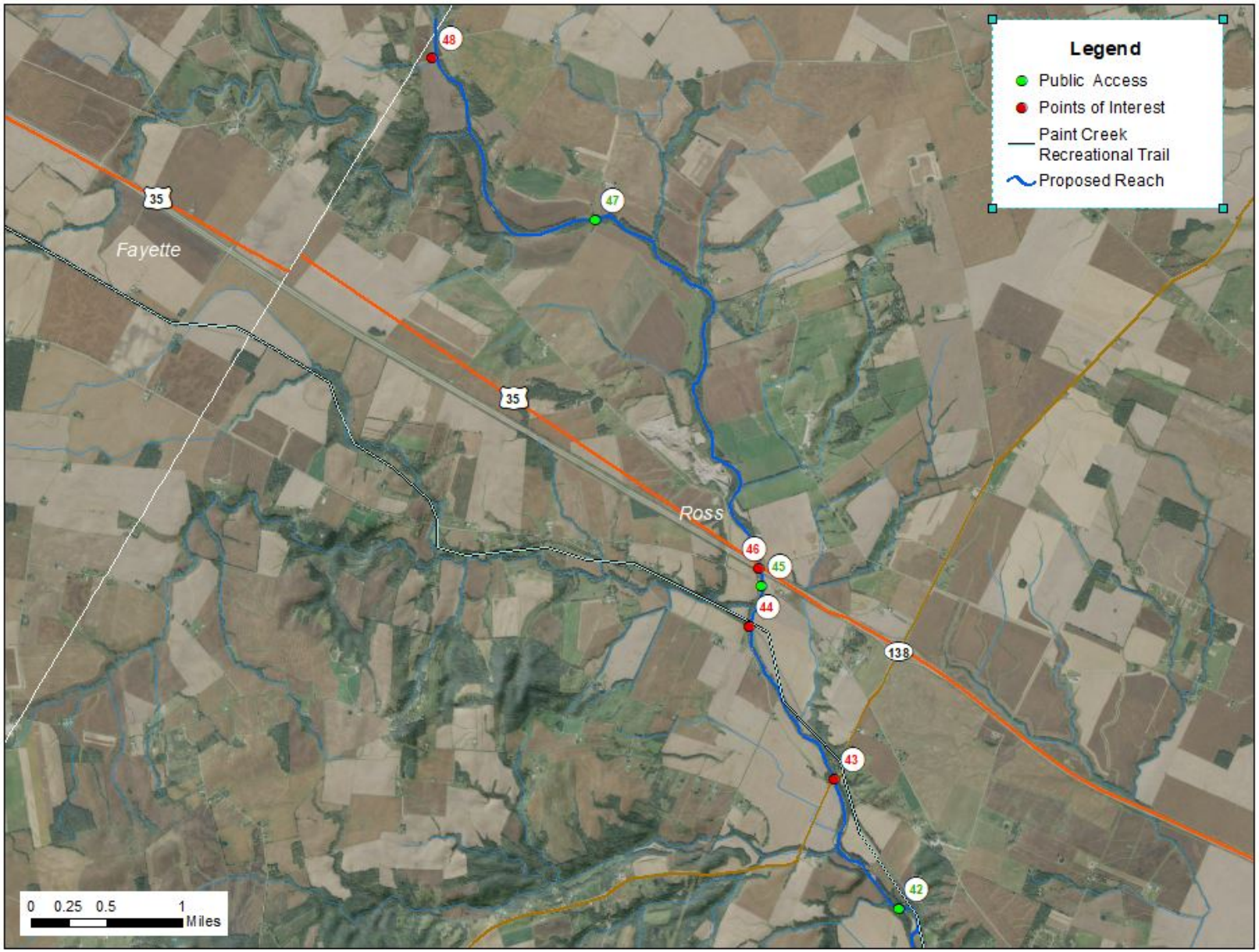

Figure 31f. Access points (green) and other points of interest (red), including major road crossings, recreational features, and natural features on upper North Fork Paint Creek. Numbers are keyed to the Paint Creek report text above.

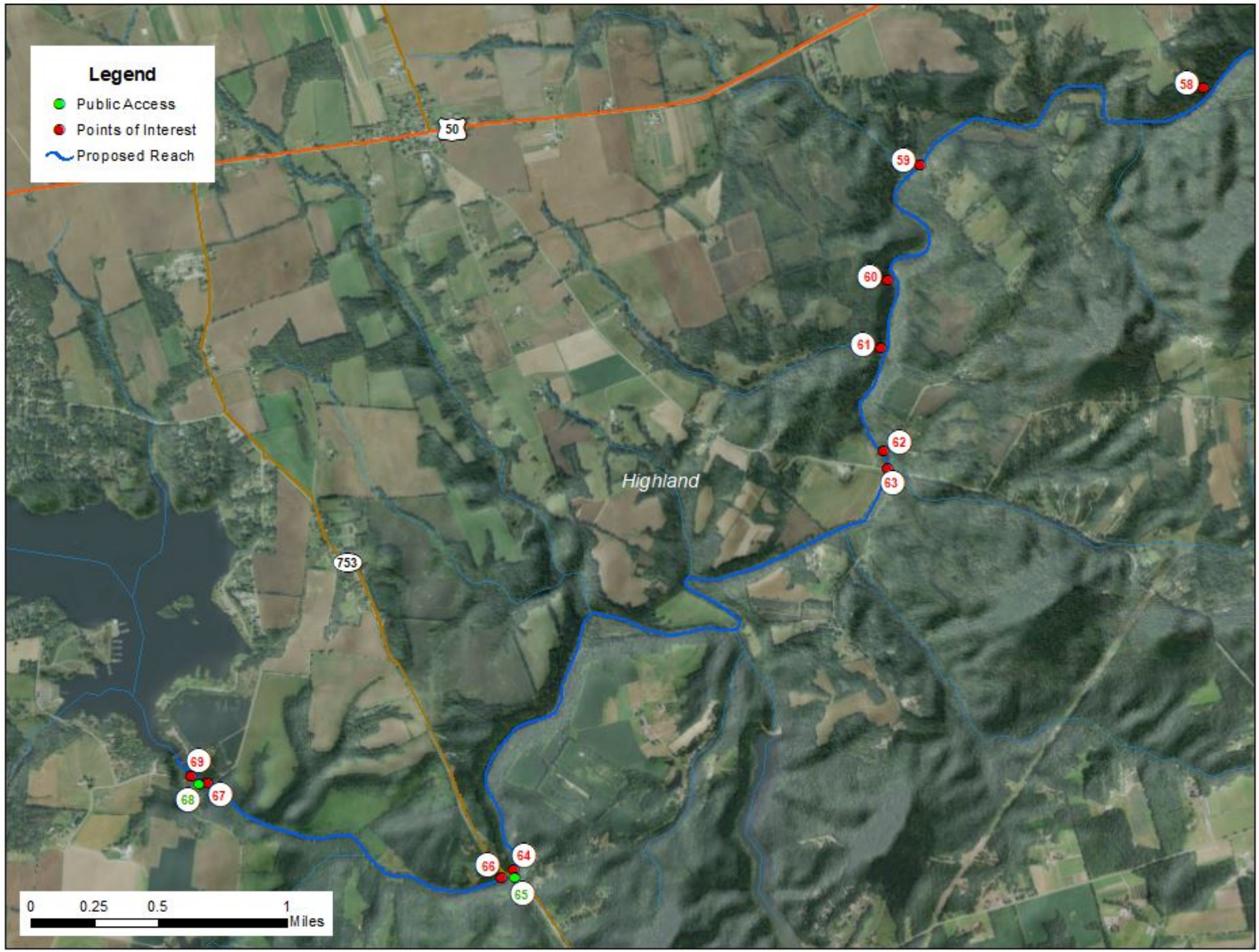

Figure 31g. Access points (green) and other points of interest (red), including major road crossings, recreational features, and natural features on Rocky Fork Creek. Numbers are keyed to the Paint Creek report text above.

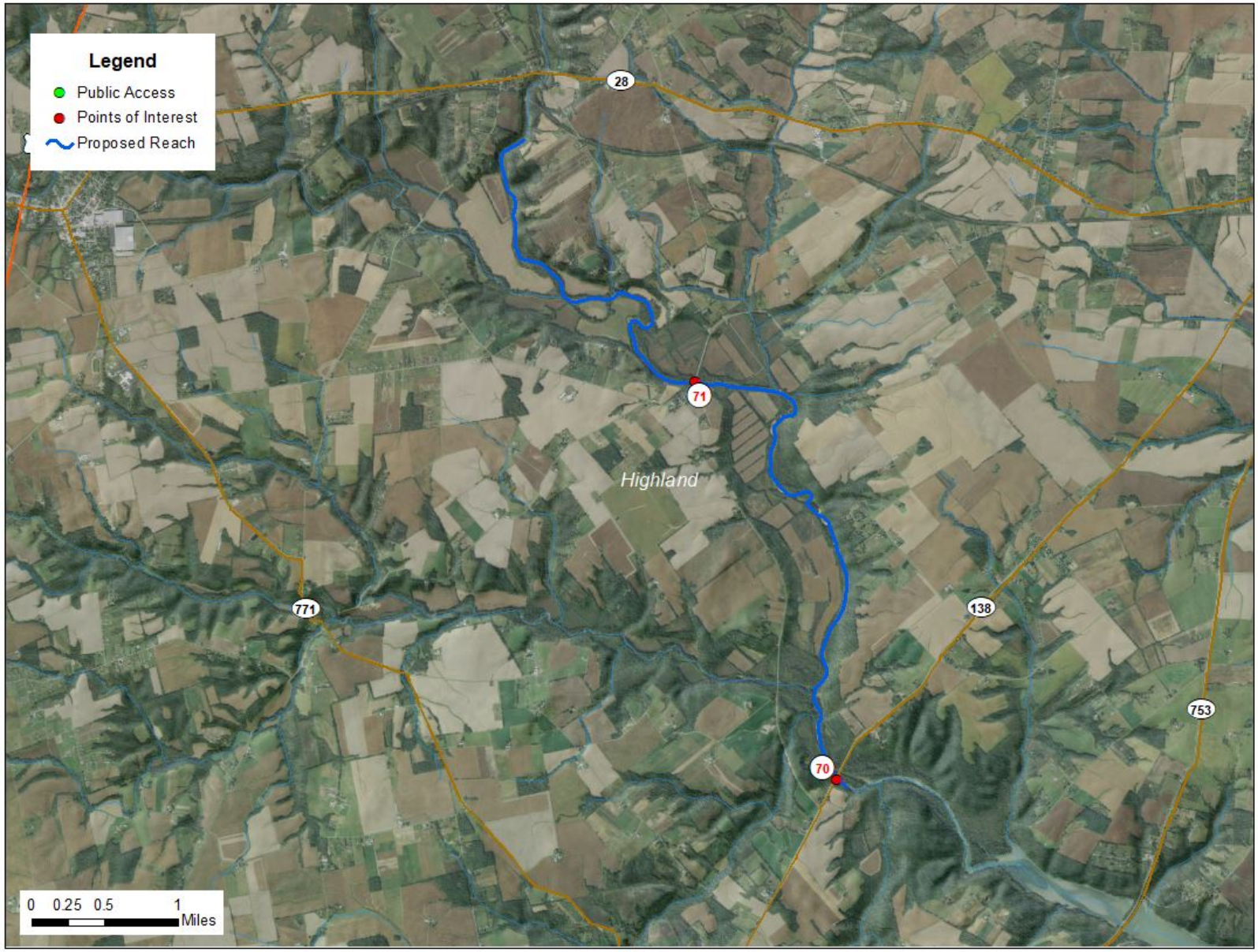

Figure 31h. Access points (green) and other points of interest (red), including major road crossings, recreational features, and natural features on Rattlesnake Creek. Numbers are keyed to the Paint Creek report text above.

Paint Creek Corridor Analysis

The primary purpose of Ohio's Scenic River program is to identify rivers in Ohio that possess characteristics of state significance. The following criteria, from Ohio Revised Code 1547.81, are used to determine whether a stream meets the standards for wild, scenic, or recreational river designation.

To obtain **wild river designation**, the following criteria must be met:

1. The proposed wild river segment must be 100% free flowing (i.e. existing or flowing in a natural channel condition without impoundments, diversions, straightening or other modifications of the river channel).

2. Roads are permissible within 300 feet of the river but may not comprise more than 10% of the wild river segment. Limited access highway crossings are permitted but no more than one crossing per 15 miles of river. No more than an average of two residential dwellings are permitted within 300 feet of the river per mile of river length.

3. For maximum benefit, the total length of the designated section of the wild river segment may be no less than 15 continuous river miles.

4. No commercial or industrial development is permitted within 300 feet of the stream or within the visual corridor, whichever is less. No more than 5% of the river's watershed may be covered with impervious surfaces upstream of the wild river segment.

5. The area adjacent to at least 75% of the stream length, considering both banks, shall be in native forest or wetland outward from the river to a depth of 300 feet or greater. In addition, 50% of the remaining corridor shall be in native forest or wetland outward from the river to a depth of 120 feet or greater.

6. All of the wild river segment must equal or exceed the Ohio EPA's exceptional warmwater or coldwater habitat standards unless natural conditions (i.e., gradient or flow) within the river segment limit the stream's ability to attain these standards. The stream segment, however, must be performing to its highest potential with regard to biological diversity and water quality given the naturally occurring limitations. If the quality of the waters at any time falls below these criteria, a means to meet the criteria must be readily available and a pollution control and abatement plan must be developed to meet the criteria and be approved by the Ohio EPA.

To obtain **scenic river designation**, the following criteria must be met:

1. The proposed scenic river segment must be 75% free flowing (i.e., existing or flowing in a natural channel condition without impoundments, diversions, straightening or other modifications of the river channel). The river must have connectivity to its natural floodplain along a majority of its length. Where such impacts have occurred, the river channel shall have been restored or recovered to the point of being capable of supporting a warmwater or coldwater habitat community.

2. Roads are permissible within 300 feet of the river but may not comprise more than 25% of the scenic river segment length.

3. For maximum benefit, the total length of the designated section of the scenic river segment may be no less than 20 continuous river miles unless connected with segments bearing other designations.

4. Some commercial, industrial and other types of development may occur within 300 feet of the river. However, this development shall not negatively impact the habitat and quality of the stream and its floodplain. No more than 10% of the river's watershed upstream and adjacent to the scenic river segment may be covered with impervious surfaces at the time of designation. If the upstream and

adjacent watershed is at 10% impervious cover and is contained within an urbanizing area, then that river segment may not be considered for designation.

5. The area adjacent to at least 25% of the stream length, considering both banks, shall be in native forest or wetland outward from the river to a depth of 300 feet or greater. In addition, 50% of the remaining corridor shall be in native forest or wetland outward from the river to a depth of 120 feet or greater.

6. All of the scenic river segment must equal or exceed the Ohio EPA's warmwater or coldwater aquatic life use designations unless natural conditions (i.e., gradient or flow) within the river segment limit the stream's ability to attain these standards. The stream segment, however, must be performing to its highest potential with regard to biological diversity and water quality given the naturally occurring limitations. If the quality of the waters at any time falls below these criteria, a means to meet the criteria must be readily available and a pollution control and abatement plan must be developed to meet the criteria and be approved by the Ohio EPA.

To obtain **recreational river designation**, the following criteria must be met:

1. The proposed recreational river segment must be 60% free flowing (i.e., existing or flowing in a natural channel condition without impoundments, diversions, straightening or other modifications of the river channel). The river must have connectivity to its natural floodplain along a majority of its length. Where such impacts have occurred, the river channel shall have been restored or recovered to a point of being capable of supporting a warmwater or coldwater habitat community.

2. Roads are permissible within 300 feet of the river but may not comprise more than 50% of the recreational river segment.

3. For maximum benefit, the total length of the designated section of the recreational river segment may be no less than 20 continuous river miles unless connected with segments bearing other designations.

4. Some commercial, industrial and other types of development may occur within 300 feet of the river. However, this development shall not negatively impact the habitat and quality of the stream and its floodplain. No more than 10% of the river's watershed upstream and adjacent to the recreational river segment may be covered with impervious surfaces at the time of designation. If the upstream and adjacent watershed is at 10% impervious cover and is contained within an urbanizing area, then that river segment may not be considered for designation.

5. The area adjacent to at least 50% of the stream length, considering both banks, shall be in native forest or wetland outward from the river to a depth of 120 feet or greater.

The purpose of this section is to summarize the results of the analysis of Paint Creek relative to the requirements for scenic river designation.

Methodology

Stream reach and watershed statistics were determined or calculated for Paint Creek and its tributaries, Upper Paint Creek (above Paint Creek Lake), North Fork Paint Creek, and Rocky Fork Creek in Ross and Highland counties (Figure 1) relative to criteria for scenic river designation. Reach criterion were measured or evaluated on 0.1-mile increments based on the Ohio EPA's rivermile maps, and statistics were calculated relative to the total reach length. Four reaches of the Paint Creek system were included in the evaluation (Figure 1, Table 1):

1. Paint Creek, from RM 3.9 to RM 39.2, at the tailwater of Paint Creek Lake and Dam;
2. Upper Paint Creek, from RM 46.5 upstream of Paint Creek Lake to the Fayette County line at RM 52.2;

3. Rattlesnake Creek, from RM 4.0 upstream of Paint Creek Lake to RM 10.8 just south of East Monroe;
4. Rocky Fork Creek, from RM 0.0 at its confluence with Paint Creek to Rocky Fork Lake at RM 9.1; and
5. North Fork Paint Creek from RM 0.0 at its confluence with Paint Creek to the Fayette County line at RM 25.3.

Watershed statistics were based on the watershed area upstream of an outlet located at RM 3.9, at approximately the Paint Street (Route 772) bridge along the southern edge of Chillicothe, 3.9 miles upstream of the confluence of Paint Creek with the Scioto River. Reach and watershed statistics were calculated separately for the Paint Creek reach meeting scenic river criteria (RM 5.3-26.2), with a continuous length of 20.4 miles.

The data used to evaluate Paint Creek relative to scenic river criteria were taken from various public sources, including

- National Land Cover Database - 2011 land cover for Ohio, clipped to watershed;
- U.S. Fish and Wildlife Service's National Wetlands Inventory - wetlands, clipped to watershed;
- United States Department of Agriculture (USDA) Farm Service Agency's National Agriculture Imagery Program - 2017 imagery for Ohio;
- ODNR's Division of Geological Survey - bedrock geology, surficial geology, and bedrock topography clipped to watershed;
- Ohio Office of Information Technology (OIT) Ohio Geographically Referenced Information Program (OGRIP) - aerial imagery and digital elevation models at the county scale;
- ODNR Geographical Information Systems - county coverages of flooding, groundwater pollution potential, wetland, and soil data; and
- Ohio EPA's River Mile Index Maps - river mile maps for reaches involved in this study.

These data were assembled and analyzed in a Geographical Information System (GIS) model. Several criteria depended on distance from streambank. Streambanks were digitized using the 2017 aerial imagey in GIS. Buffers of 120 feet and 300 feet were created and overlayed on aerial imagery and other data coverage for analysis of the presence or absence of roads, land uses with impervious areas, forests, and wetlands. Hydrologic data were compiled from gaging station data of the U.S. Geological Survey, and water quality data are summarized from studies conducted by the Ohio EPA Division of Surface Water. In the following sections, individual criteria for scenic river designation are described, both relative to their measurement or evaluation as well as the results.

Free-flowing

The free-flowing nature of rivers is important for developing the natural stream features required for scenic designation. Free-flowing rivers are characterized as existing or flowing in a natural channel condition without impoundments, diversions, straightening or other modifications of the river channel. Impoundments are present in the upper parts of the Paint Creek watershed, most importantly those associated with Paint Creek Dam and Rocky Fork Dam (Figure 2). Impounded areas of Paint Creek Lake and Rocky Fork Lake are not included in the reaches proposed for scenic river designation. Paint Creek Dam was constructed for flood control and therefore impacts the natural hydrology of the system especially during rainfall-runoff events. This is clear from the USACE's Paint Creek Lake record for inflow and outflow relative to their control of lake level (Figure 32). Inflow is peaked, reflecting the impact of rainfall on runoff upstream from the lake. Streams rise rapidly during a rainfall event and tend to drop off immediately after rainfall stops. Inflow to Paint Creek Lake reflects this (the green dashed line in Figure 32). The USACE determines outflow from the

lake daily, relative to reservoir levels and downstream low conditions, in order to alleviate downstream flooding. Therefore, outflow tends to be step-like, up or down, occurring daily (the purple line in Figure 32).

Immediately downstream, streamflow reflects both, peaked flow from uncontrolled parts of the watershed preceding controlled releases with the more step-like character. The U.S. Geological Survey's Bourneville gage, approximately 16.7 miles downstream of Paint Creek Lake, illustrates this well (Figure 33). Flow from unregulated parts of the watershed upstream of this gage (i.e., Rocky Fork Creek and Buckskin Creek-Paint Creek subwatersheds [Figure 3]) is peaked in response to rainfall during the early mornings of June 9 and 13, 2018. Increases in daily releases from Paint Creek Lake starting midday on June 9 and 13, 2018, and lasting for approximately 24 hours produce the broad-crested flow events that followed natural flow. Rocky Fork Dam is a run-of-river dam, designed to increase water level behind the dam but not provide downstream flood control. Downstream on Paint Creek, the impact of Paint Creek Dam is diminished because flow from the remainder of the watershed-approximately half of the total watershed area including the Rocky Fork Creek and North Fork Paint Creek subwatersheds-is not regulated. Lowhead dams, most associated with former mills, are present on Upper Paint Creek and Rocky Fork Creek, but they do not alter flow, and their impact on flow depth is local.

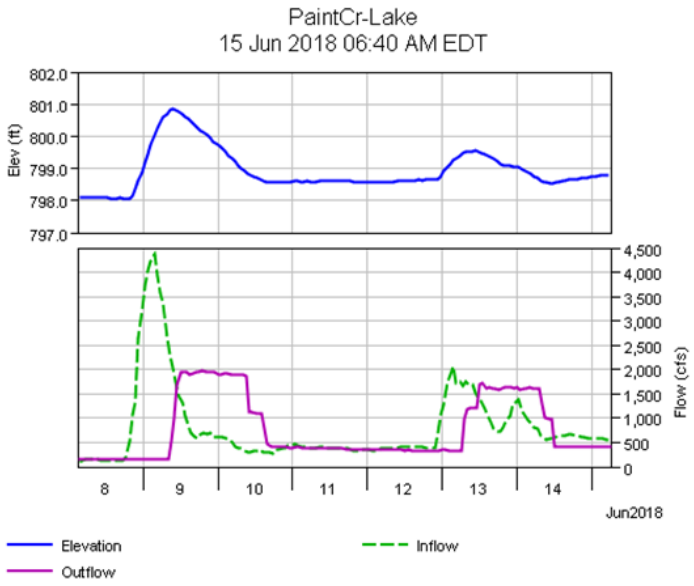

Figure 32. Paint Creek Lake record of lake level, inflow, and outflow for the week of June 8-15, 2018. In order to control downstream flooding, inflow (dashed green line) is stored in Paint Creek Lake, indicated by the increased elevation of the lake in blue, and released downstream in a controlled manner sometime after it flows into the reservoir (purple solid line).

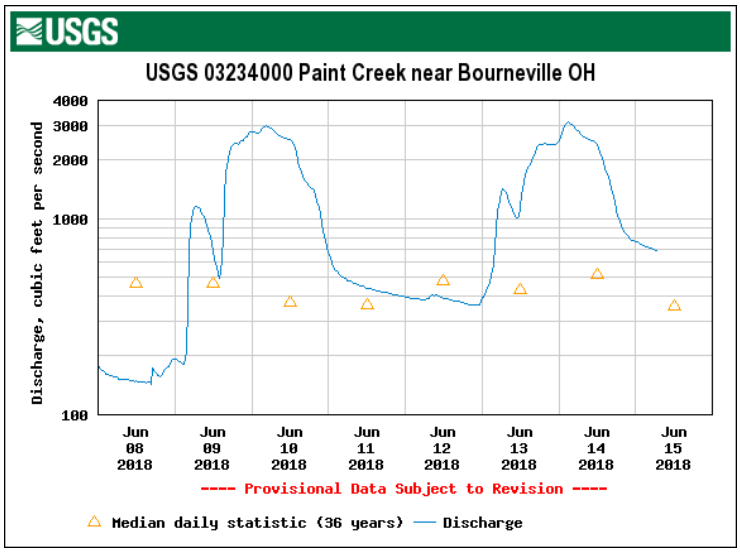

Figure 33. Paint Creek discharge at Bourneville, illustrating both natural streamflow, the peaked flow, as well as controlled outflow, the broad-crested flow following the peaks, for two rainfall-runoff events for the week of June 8-15, 2018.

Natural, free-flowing streams in Ohio tend to exhibit a meandering pattern and the results of meandering, including active point bars and cutbanks, meander cutoffs, and evidence of former channel positions on the floodplain (Figure 34). Meandering is quantified by a metric called *sinuosity*, which is the ratio between channel and valley length. A stream that meanders along its valley is longer than the straight-line length of the valley. Straight or straightened streams have a sinuosity near 1 since the stream length is the same or nearly the same as the valley length. The transition from straightened to meandering channels is typically accepted as 1.5, indicating the channel length of a meandering stream length is 1.5 times longer than the valley length. The average sinuosity of the mainstem of Paint Creek is 1.52.

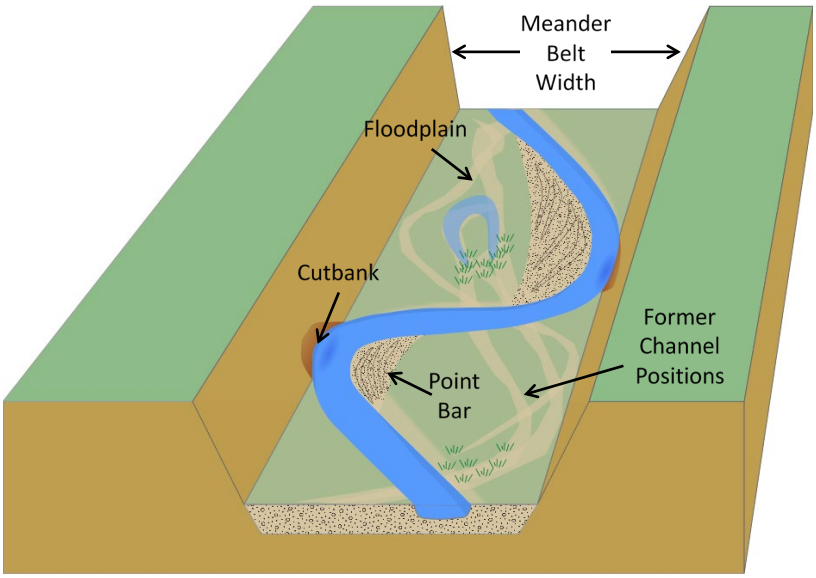

Figure 34. A meandering stream is dynamic, swinging outward toward the valley margins and sweeping downstream, by erosion along cutbanks and deposition of sand and gravel on point bars. The lateral migration of meanders forms a floodplain over time with evidence of former channel positions and meander cutoffs.

Three attributes of meandering on Paint Creek are especially noteworthy: active or current meandering, historical meandering across the entire valley width, and evidence of post-glacial meandering and adjustment

to changes in sediment and water discharge over time. A meandering stream pattern may or may not be indicative of active meandering of the stream. Active meandering involves lateral erosion along cutbanks and deposition on point bars and is responsible for the creation and maintenance of the floodplain of Paint Creek (Figure 34). It is evident by the presence of steep cutbanks and active sand and gravel deposits on point bars that have changed position, migrating downstream, over time. Active point bars are especially obvious by their lack of vegetation, indicating recent deposition and their mobility during larger flood events. The reach shown in Figure 35 illustrates active meandering on Paint Creek and its migration over just 21 years: erosion on cutbanks (e) and deposition on point bars (d) alternate from side to side on the channel, and the active channel position has shifted in the direction of erosion, downstream, over time. Average rate of the downstream shift of meanders exceeds 13 feet per year at locations along this reach (Figure 35).

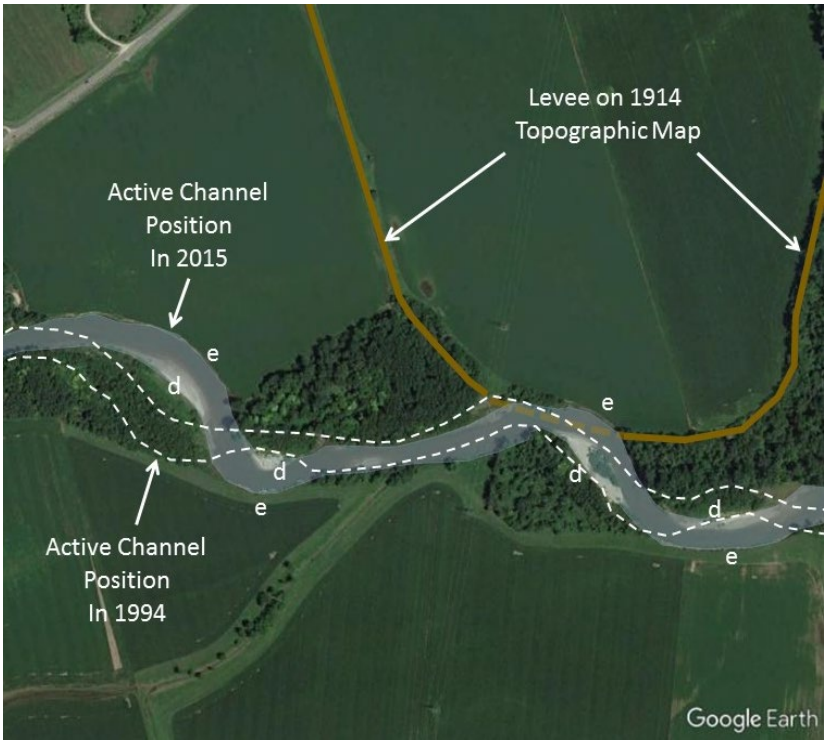

Figure 35. Position of the active channel of Paint Creek at RM 15.2-16.0 illustrating the migration of the meander downstream (to the right of the photo) from 1994 to 2015. Sometime before 1994, a levee constructed prior to 1914 was breeched and not repaired. The letters refer to erosion (e) along cutbanks and deposition (d) along point bars.

In natural systems, the meander swings from valley wall to valley wall, creating a meander belt width proportional to bankfull stream discharge, forming the floodplain (Figure 34). Paint Creek no longer actively meanders across its entire valley floor, impinging on the upland along each valley wall; but evidence on the floodplain indicates it has in the recent past (Figure 36). A Relative Elevation Model, or REM, represents elevations relative to the stream's water surface or active channel as opposed to sea level. An REM is a useful tool for examining subtle floodplain landforms created by historical meandering. In the Paint Creek valley, evidence of historical meandering exists on the floodplain of Paint Creek and includes former channel positions, meander scars, meander cutoffs, and scalloped valley walls (Figure 36). In addition, nearly the entire meander belt width is comprised of soils of the Ross and Gessie Series, which are frequently or occasionally flooded (U.S. Department of Agriculture Natural Resources Conservation Service, 2020).

The REM also shows evidence of meandering and adjustment to changes in sediment and water discharge over longer periods of time (Figure 36). Rivers erode vertically in response to changes in sediment and/or water discharge and abandon their previously formed floodplains. The abandoned surfaces, called *terraces*, retain their relatively flat topography but generally are no longer flooded as they are topographically higher than the active floodplain. The REM of Paint Creek shows two terraces on the southeast side of the valley,

both of which have evidence of past meandering. The lower terrace, approximately 4 feet higher than the historical floodplain, is scalloped by more recent meandering of Paint Creek (Figure 36).

Active meandering is less common in upper channel reaches, where channel processes are dominated by vertical erosion as opposed to lateral erosion. This is true for the Paint Creek system: Upper Paint Creek, Rocky Fork Creek, Rattlesnake Creek, and North Fork Creek do not exhibit the extent of meandering evident on the mainstem of Paint Creek.

Though levees constructed prior to 1914 are present in several areas within the Paint Creek valley, they are not continuous and do not line both sides of the stream. Instead, it appears that they were constructed to maintain channel position for specific properties. Breeches in these levees have not been repaired (Figure 35) therefore they do not channelize flow nor constrain meandering in an appreciable way. Landowners locally mitigate erosion along cutbanks by placing riprap along streambanks composed of natural materials (e.g., boulders) and human debris (e.g., construction debris, washing machines, automobiles), but its combined extent is neglible. Most channelization and straightening are associated with bridge crossings. As a result of the minimal use of levees, Paint Creek and its tributaries are hydrologically connected to their floodplains. Figure 25 shows the extent of flooding of the 100-year flood, in some cases filling the full extent of the valley along the mainstem Paint Creek. At locations such as this, floodplain width is as much as 1.4 miles across. Upstream (and in The Narrows), the width of the floodplain decreases. Smaller floods cover less area, but it appears they have access to lower floodplains.

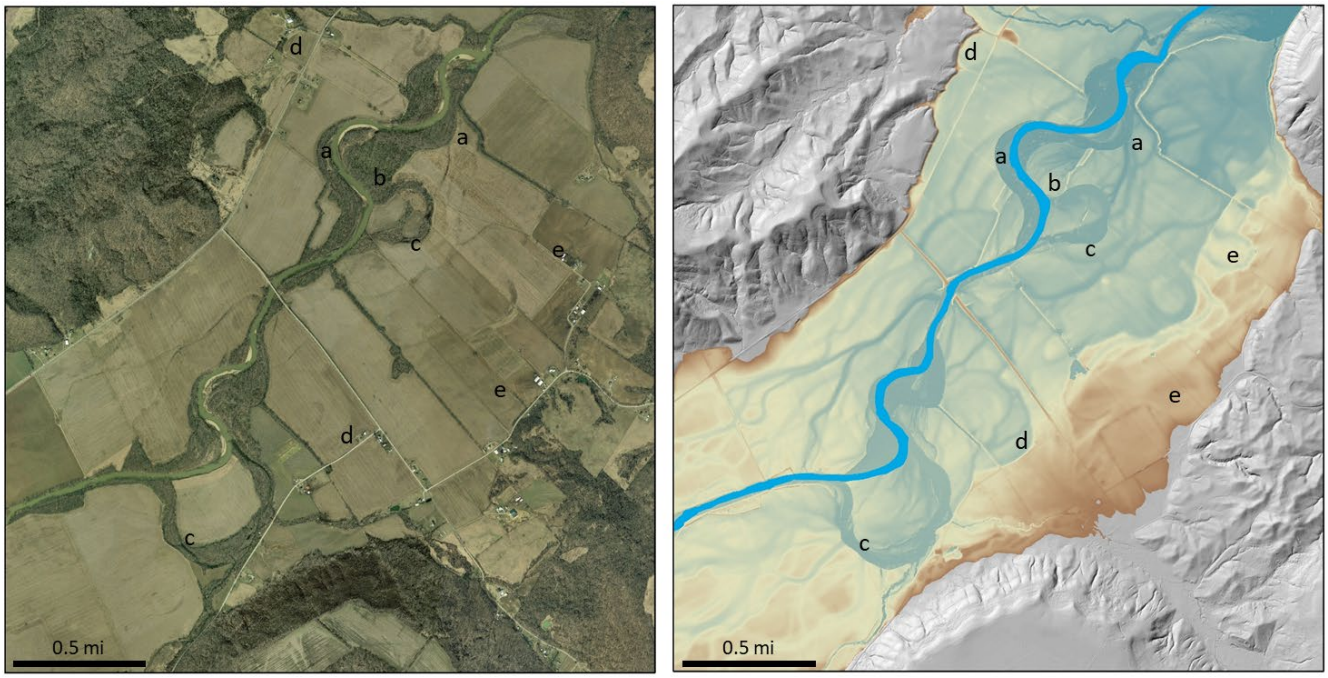

Figure 36. The aerial image (left) and REM (right) for the reach of Paint Creek, upstream of Bourneville (approximately RM 19.1 to RM 24.0), illustrating active (a) erosion on cutbanks and (b) deposition on point bars, (c) meander cutoffs, (d) scalloped valley margins, and (e) terraces.

In this analysis, a reach segment was defined as free-flowing if it was not obstructed by dams or not constrained by levees, straightening or channelization, roads, or bridges. The proportion of free-flowing stream reaches varied between 85% on North Fork Paint Creek to 99% on Rocky Fork Creek (Table 6).

Roads

Roads are permissible within 300 feet of the river for scenic river designation but may not comprise more than 25% of the scenic river segment length. Using the 300-ft buffer, the presence or absence of roads was tabulated at 0.1-mile increments using 2017 aerial imagery. If a road was present within the buffer and occupied more than half to the 0.1-mile increment, the increment was classified as having a road. Roads within the 300-ft buffer tended to dominate those reaches where valley width accommodated a road, but locally high relief constrained its location. This was especially true along Upper Paint Creek where roads were within 300 feet of the river along 60% of the reach (Table 6). Along the other reaches, roads were within 300 feet of the river along 18-37% of the reach. Bike paths were considered a land use compatible with scenic rivers and were not included in this calculation.

Length

A total of 81.7 miles of stream was analyzed in this study along five different segments (Figure 1), including 34.8 continuous miles on Paint Creek and 25.3 continuous miles on North Fork Paint Creek (Table 6). For designation, a continuous stream reach of at least 20 miles must meet all criteria.

Impervious Surface Area

The prevalence of impervious surface adjacent to the stream reaches and within the watershed was evaluated in two ways. Along the stream reaches, within the 300-ft buffer, commercial and industrial land use was noted at 0.1-mile increments using 2017 aerial imagery. It did not include roads as they were included in an earlier metric. Impervious surface area within the watershed also was calculated using the 2011 land cover data, the most recent available. A comparison of the 2011 land cover data and land use based on 2017 aerial imagery did not suggest an appreciable change in land cover, even in developing areas, since 2011. The 2011 land cover was clipped to the watershed area. Land cover was classified as developed, whether it was low, medium, or high intensity development. All levels of development were included as impervious area even though a cell classified as developed includes both impervious (e.g., roof and sidewalk) and pervious surfaces (e.g., grass). Developed open space (e.g., parks, cemeteries, golf courses) was not included in this total since they are typically large areas with very little actual imperviousness.

Land use with impervious areas within 300 feet of the proposed streams varied between 0% and 7% of the stream reach length (Table 6). Land cover in 2011 was predominantly agricultural in the low relief part of the watershed to the north and deciduous forest in the high relief areas in the southern part (Figure 10). Cultivated crops and hay and pasture accounted for 69.4% of the land cover in the watershed, and deciduous forest covered 20.0% of the watershed (Table 4). Combined, these three land covers account for 90% of the total watershed area. Most of the remaining land cover is developed open space and water (4.7%), much of it associated with national, state, and county parks. Relative to the watershed areas defined by the downstream point of each proposed stream reach, land cover with impervious surfaces comprised between just 1.6-3.6% of the respective watersheds (Table 6).

Forest or Wetland

Riparian forest buffers provide several ecosystem services that maintain or preserve water quality. Nutrient retention and cycling are primary functions. Forested riparian buffers help protect rivers from the effects of nonpoint source pollution, especially fertilizers associated with adjacent land uses. Trees and understory shrubs absorb nonpoint pollutants from shallow subsurface runoff and shallow groundwater. Two of the major nonpoint-source pollutants which are removed by forest buffers are nitrogen and phosphorus. In addition, forested riparian areas and floodplains provide a buffer between areas of less pervious and

impervious surfaces, allowing rainfall and runoff to infiltrate and recharge groundwater. They also provide critical habitat and corridors for movement and dispersal of plants and animals.

Riparian wetlands, some of them forested, also occur along most natural streams. Flooding and a high water table produce the saturated conditions that support hydrophytic vegetation and produce the hydric soils by which wetlands are delineated. Wetlands provide habitat for waterfowl, migrating birds, hydrophytic vegetation, and aquatic and semiaquatic animal species. They also serve in a regulating capacity by storing flood water and carbon-rich sediment and providing groundwater recharge. Wetlands adjacent to Paint Creek and its tributaries also function in a supporting capacity by trapping and cycling nutrients and storing suspended sediment that erodes from adjacent agricultural fields.

Forested land cover within 120 and 300 feet of Paint Creek and its tributaries was determined using 2017 aerial imagery. Using the 120-ft and 300-ft buffers in GIS, the presence or absence of forest was tabulated at 0.1-mile increments depending on wether it covered the increment entirely. The presence and extents of wetlands within the buffered area were based on the U.S. Fish and Wildlife Service's wetland inventory. In order for an increment to be counted in either the 120-ft or 300-ft category, the segment had to be considered as forest and/or wetland on both banks.

Forested land dominated this category compared to the area mapped as wetland. As much as 34% of the Rattlesnake Creek segment is forested and/or contains wetland on both streambanks to a depth of 300 feet (Table 6). Of the remaining reach of Rattlesnake Creek, 96% is forested or contains wetland on both streambanks to a depth of at least 120 feet. This is owing to a combination of circumstances, including large parcels dedicated to preservation or recreation (e.g., Paint Creek State Park) or agriculture. North Fork Paint Creek had the least amount of streamside area in forest or wetland in the 300-ft buffer category along 11% of the total stream reach, though 56% of the remaining reach is forested or contains wetland within the 120-ft buffer (Table 6). On the mainstem of Paint Creek, 20% of the corridor is forested or contains wetland to a depth of 300 feet, and of the remaining reach length, at least 62% is forested or contains wetlands in the 120-ft buffer (Table 6). Notable along the mainstem of Paint Creek are two reaches, a 3.5-mile reach at Buzzards Roost Nature Preserve (RM 11.5-15.0) and a 0.9-mile reach of extensive, privately-owned forested wetland downstream (RM 5.3-6.2).

Water Quality

Criteria associated with land use and land cover, including the proximity of roads, the amount of impervious surface, and the abundance and extent of forest and wetlands, are important relative to the water quality, biological diversity, and overall natural character of a river system. They serve to protect and enhance water quality within the river, either by limiting potential sources of pollution and their proximity to the river or by buffering the system from it. These natural attributes also contribute to the quality of the experience on, or aesthetic of, a scenic river. Direct evidence of good to exceptional water quality is a critical component in consideration of a wild, scenic, or recreational river designation. Scenic river segments must equal or exceed the Ohio EPA's warm water habitat (WWH), exceptional warmwater habitat (EWH), or cold water habitat (CWH) aquatic life use designations unless natural conditions (i.e., gradient or flow) within the river segment limit the stream's ability to attain these standards.

Water quality on Paint Creek, Rocky Fork Creek, and North Fork Paint Creek has been periodically assessed by regional, state, and federal agencies and organizations, including the USGS and the Ohio EPA. Water quality data from the USGS was collected primarily in the 1970s and the latest data, except for temperature, was from the 1980s, so it was not included in this analysis. The Ohio EPA conducted ambient biological, water column chemical, and sediment sampling in the Paint Creek watershed from June to October 2006 as part of their periodic monitoring and assessment (Ohio Environmental Protection Agency, 2008a). Based on this assessment, loading analyses were completed for the Paint Creek Watershed for fecal coliform, nitrate, habitat, and bedload sediment by the Ohio EPA. Total maximum daily loads for the Paint Creek watershed

Table 6. *Reach and watershed statistics relative to criteria for scenic river designation for Paint Creek in Ross County and its tributaries, Upper Paint Creek (above Paint Creek Lake), North Fork Paint Creek, and Rocky Fork Creek. Reach statistics are calculated based on 0.1-mile increments relative to the total reach length. Watershed statistics are based on watershed area upstream of an outlet located at the downstream end of the respective reach.*

Segment	Reach Length (mi)	Watershed Area at Downstream End of Reach (mi^2)	Free-flowing (% of reach length)	Road within 300 ft of river (% of reach length)	Commercial land use with impervious areas within 300 ft (% of reach length)	Land use with impervious areas (% of watershed)	Forest or wetland within 300 ft on both sides (% of reach length)	Forest or wetland within 120 ft on both sides (% of reach length)*
1. Paint Creek (Paint Bridge at Rt 772 to tailwater of Paint Creek Lake and Dam)	34.8	1136.1	97	37	0	3.6	20	62
2. Upper Paint Creek (upstream of Paint Creek Lake to Greenfield)	5.7	295.8	98	60	7	3.1	16	48
3. Rattlesnake Creek (upstream of Paint Creek Lake to south of East Monroe)	6.8	251.2	99	3	0	1.6	34	96
4. Rocky Fork Creek (confluence with Paint Creek to Rocky Fork Dam)	9.1	144.2	99	27	0	2.9	32	26
5. North Fork Paint Creek (confluence with Paint Creek to Fayette County line	25.3	234.2	84	18	6	1.8	11	56

* Reach length for this calculation does not include the reach length with the 300-ft buffer of forest or wetland on both sides.

were completed and approved in 2012 (Ohio Enviromental Protection Agency, 2012). The TMDL reports are significant in that they identify and evaluate water quality problems in impaired stream reaches and propose solutions to bring those waters into attainment with water quality standards. The Paint Creek watershed also has an Ohio EPA state-endorsed watershed action plan to address non-point source pollution (Solomon, 2002).

In compliance with the Clean Water Act, minimum water quality standards for all surface waters of the state were established in Chapter 3745 of the Ohio Administrative Code (2012) relative to their designated use. Beneficial use designations are assigned by the Ohio EPA to the state's water bodies. The designations describe existing or potential uses of water bodies based on the use and value of water for public water supplies, protection and propagation of aquatic life, recreation in and on the water, agricultural, industrial, and other purposes. Beneficial use designations relative to aquatic life habitat, water supply, and recreation for reaches of Paint Creek, Rocky Fork Creek, and North Fork Paint Creek proposed for scenic river status are tabulated in Table 7.

To evaluate the quality of stream ecosystems and whether they meet their beneficial use designations, the Ohio EPA utilizes a testing regime with several different measures of quality, including water chemistry and quality, stream habitat, aquatic macroinvertebrate communities, and fish communities. The following parameters or indices are used by the Ohio EPA in streams throughout the state of Ohio:

Water Chemistry and Water Quality - Water and sediment are sampled for a wide variety of chemical pollutants. Concentrations of various pollutant levels in these samples are compared to known concentration limits that reflect varying degrees of chemical impairments or acute or chronic toxicities in the stream ecosystem. The concentrations of various pollutants found in water samples can then be used to evaluate or predict various impacts to a stream based on their levels in that stream system. The presence of certain chemicals in water samples may also reflect inputs from various point source (end of pipe) discharges or non-point source (sediment particles, nutrient loads in surface run-off) and provide insight with regard to remediation measures necessary to address chemical impairments in a stream system.

Chemical and physical water quality is typically assessed through collections of surface water grab samples. These samples can then be analyzed for a variety of organic and inorganic pollutants, heavy metals, and nutrients. Dissolved oxygen levels, pH and temperatures are also typically recorded for each sampling location.

Qualitative Habitat Evaluation Index (QHEI) - The QHEI is an objective method of measuring physical habitat conditions by examining and assigning numeric values to various attributes of the physical habitat including riparian corridor, substrate types, in-stream cover, geomorphology, pool and riffle development, and other parameters.

Index of Biological Integrity (IBI) - The IBI is a means of objectively measuring and evaluating biological community performance based on the number of fish species found, the presence of certain indicator species, the numbers of individuals found and other characteristics of the fish community.

Modified Index of Well-being (MIwb) - The MIwb is an objective method of measuring and evaluating fish community performance. This methodology measures fish community abundance and diversity using numbers and weight information. Fish communities are sampled using various types of electro-fishing equipment appropriately sized for the stream being surveyed. During the survey, all fish specimens in a designated sampling reach (again determined by stream size and conditions) are collected. Fish are then sorted by species and all individuals are counted and weighed. Eroded fins,

lesions, parasites, and other notable abnormalities are also recorded. Data generated from the surveys are used to calculate the IBI and MIwb values.

Invertebrate Community Index (ICI) - The ICI is a method of evaluation applied to aquatic macroinvertebrate community performance and characteristics using parameters developed from and similar to the IBI. Macroinvertebrate communities are sampled using sets of artificial substrates known as Hester Dendy (HD) samplers. Basically, the sampler is comprised of a set of eight hardboard squares stacked together and secured with an eyebolt. Five sets of the samplers are attached to a concrete block and placed in the stream for a six-week period between June 15 and September 30. During this time macroinvertebrates will colonize the samplers, which are then removed from the stream. Macroinvertebrates are then collected from the HD samplers for identification and counting in the laboratory. Macroinvertebrate data collected through this method is used to calculate the ICI values.

Table 7. *Beneficial use designations for Paint Creek and its tibutaries, including the reaches proposed for scenic designation, established by the federal Clean Water Act and the Ohio Administrative Code.*

	Beneficial Use Designation		
Reach	**Aquatic Life Habitat**	**Water Supply**	**Recreation**
Paint Creek (below Paint Creek Lake to S.R. 772/RM 3.8)	exceptional warmwater habitat (EWH)	agricultural and industrial water supply	primary contact recreation
Upper Paint Creek (above Paint Creek Lake)	exceptional warmwater habitat (EWH)	agricultural and industrial water supply	primary contact recreation
Rocky Fork Creek	exceptional warmwater habitat (EWH)	agricultural and industrial water supply	primary contact recreation
Rattlesnake Creek	exceptional warmwater habitat (EWH)	agricultural and industrial water supply	primary contact recreation
North Fork Paint Creek	exceptional warmwater habitat (EWH)	agricultural and industrial water supply	primary contact recreation

Paint Creek and its tributaries that are proposed for scenic river designation have been categorized as exceptional warmwater habitat. Exceptional warmwater refers to "… waters capable of supporting and maintaining an exceptional or unusual community of warmwater aquatic organisms having a species composition, diversity, and functional organization comparable to the seventy-fifth percentile of the identified reference sites on a statewide basis" (Ohio Revised Code 3745-1-07). The attributes of species composition, diversity, and functional organization will be measured using IBI, MIwb, and ICI, and habitat will be measured by QHEI. IBI, MIwb, ICI, and QHEI scores that typify species composition of exceptional warmwater fauna and habitat conditions that support it in the Eastern Corn Belt Plains (ECBP) ecoregion are included below.

IBI	50
Headwater or Wading/Boat MIwb	9.4/9.6
Wading/Boat ICI	46
QHEI	75

The status of aquatic life use attainment along the proposed reaches of Paint Creek and its tributaries is based on sampling in June-October 2006 at numerous locations along the stream system (Table 8). A total of 15 sampling stations are located on reaches of Paint Creek and its tributaries proposed for designation. With the exception of three sampling locations, at RM 48.9, 39.0, 32.5, these sample locations are in full attainment with the exceptional warmwater aquatic life use designation (Table 8). For sample locations in full attainment, IBI ranges from 44 to 58, MIwb from 9.1 to 11.0, ICI from 48 to 56, and QHEI from 78.5 to 88.5. Sampling locations that do not meet full attainment have clear proximal causes related to impoundment, immediately upstream (RM 39.0) and downstream (RM 32.5) of Paint Creek Lake, and immediately downstream of Greenfield's municipal wastewater treatment plant (RM 48.90). The impoundment causes nutrient enrichment and low dissolved oxygen, and outfall from the wastewater treatment plant causes nutrient and organic enrichment. Paint Creek assimilates these impairments downstream as all downstream sampling locations are in full attainment.

Chemical and physical water quality is typically assessed through collections of surface water grab samples. Samples collected in 2006 by the Ohio EPA were analyzed for a wide variety of chemical and physical water quality parameters, as well as chemical pollutants, to evaluate the degree of chemical impairment. Samples were collected during summer and fall and therefore likely represent low-flow conditions. The data for nitrate and nitrate as nitrogen, total phosphorus, and dissolved oxygen were selected for presentation here because the causes of impairments at sites not in full attainment (Table 8) were related to nutrient and organic enrichment from wastewater treatment plants on Paint Creek (Figure 37) and North Fork Paint Creek (Figure 38) and nutrient enrichment and low dissolved oxygen above and below water impounded by Paint Creek Lake (Figure 37).

Outfall from the wastewater treatment plant, sampled at RM 49.6 on Paint Creek is higher in total phosphorus and lower in dissolved oxygen than Paint Creek flow, but nitrate and nitrite as nitrogen is similar (Figure 37). This is true for wastewater treatment plant outfalls on North Fork Paint Creek at RM 14.26 and 4.0 as well, though the range of nitrate and nitrite as nitrogen is significantly higher as well. Values of nitrate and nitrite as nitrogen and total phosphorus are lower and the variation much less upstream and downstream of wastewater treatment plants suggesting North Fork Paint Creek is able to assimilate discharge from treatment plants downstream of outfalls (Figure 38) to the point that downstream sample points are in full attainment relative to its exceptional warmwater designation. On Paint Creek, values for nitrate and nitrite as nitrogen and their range of variation decrease downstream of Paint Creek Lake (RM 31.5 and lower; Figure 37); total phosphorous and dissolved oxygen do not show consistant change downstream of the impoundment.

In summary, Paint Creek, Rocky Fork Creek, and North Fork Paint Creek in the reaches proposed for scenic river designation meet the Ohio EPA's aquatic life use designations for Exceptional Warmwater Habitat at all sample locations except those samples on Paint Creek impacted by impoundment near Paint Creek Lake (RM 39.0 and RM 32.5) and downstream of the wastewater treatment plant in Greenfield (RM 48.9).

Table 8. *Aquatic life use attainment status of the proposed reaches of Paint Creek and its tributaries based on sampling in June-October 2006. The Index of Biotic Integrity (IBI), Modified Index of Well Being (MIwb), and Invertebrate Community Index (ICI) scores are based on the performance of fish (IBI, MIwb) and macroinvertebrate (ICI) communities. The Qualitative Habitat Evaluation Index (QHEI) is a measure of the ability of the physical habitat to support biological communities.*

Stream River Mile, Invertebrate/Fish	Attainment Status[a]	IBI	MIwb	ICI/Narrative[b]	QHEI	Drainage Area	Sources[c]	Causes[d]
05060003 050 Paint Creek								
Paint Creek		*EWH-*	*Existing*					
52.5	Full	48	9.1	50	78.5	249.0		
48.9	Partial	44*	8.5*	54	83.0	261.0	Municipal WWTP	Nutrient/Organic Enrichment
39.0	Partial	46	10.2	18*	82.0	570.0	Impoundment	Enrichment/Low D.O.
05060003 060 Rocky Fork Creek								
Rocky Fork Creek		*EWH-*	*Existing*					
3.1	Full	44	9.5	Except	88.5	140.0		
05060003 070 Paint Creek								
Paint Creek		*EWH-*	*Existing*					
32.5	Partial	46	11.2	32ns	81.0	773.0	Impoundment	Enrichment/Low D.O.
27.5	Full	51	10.8	48	84.5	788.0		
21.6	Full	53	11.0	50	80.0	807.0		
05060003 040 Rattlesnake Creek								
Rattlesnake Creek		*EWH-*	*Existing*					
7.90	Full	50	9.0	52	71.3	209.0		
05060003 080 North Fork Paint Creek								
North Fork Paint Creek		*EWH-*	*Existing*					
22.3	Full	55	10.4	50	84.0	122.0		

17.0	Full	56	10.8	V. Good	84.0	153.0
13.6	Full	52	10.9	50	86.5	164.0
10.5	Full	56	10.5	56	79.0	207.0
3.9	Full	58	10.7	56	81.5	230.0
2.30	Full	58	10.7	54	75.0	232.0
05060003 100 Paint Creek						
Paint Creek		*EWH-*	*Existing*			
8.9	Full	56	11.4	56	82.0	895.0
3.8	Full	54	10.6	52	83.5	1138.0

Notes:

A Use attainment status based on one organism group is parenthetically expressed.

b Narrative evaluation used in lieu of ICI (E=Exceptional; G=Good; MG_{ns}=Marginally Good; F=Fair; P=Poor).

c Sources listed are considered to be a primary influence on water quality but may not be the only issue leading to impairment. See text for discussion of additional causes that cumulatively led to impairment.

d Causes listed are considered to be a primary influence on water quality but may not be the only issue leading to impairment. See text for discussion of additional causes that cumulatively led to impairment.

* Significant departure from ecoregion biocriterion; poor and very poor results are underlined.

ns Nonsignificant departure from biocriterion (<4 IBI or ICI units; <0.5 MIwb units).

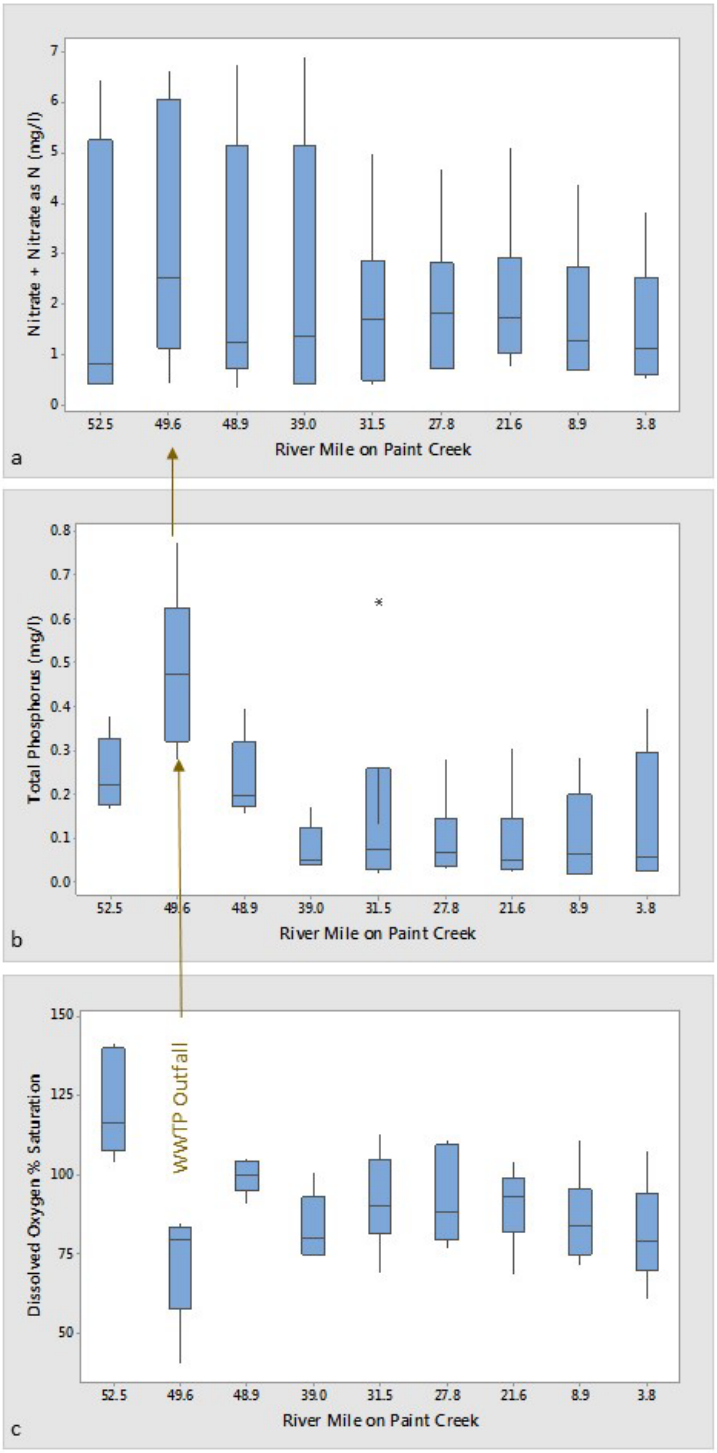

Figure 37. Water quality of Paint Creek samples collected June-October 2006 by the Ohio EPA for (a) nitrate and nitrite as nigtrogen, (b) total phosphorus, and (c) dissolved oxygen. The box represents the extent of the first quartile, median value, and third quartile; the lines represent minimum and maximum values with outliers represented as asterisks. For agricultural streams, the EPA considers an appropriate level of total nitrogen ranging from 0.12 to 2.2 mg/l and of total phosphorus ranging from 0.01 to 0.075 mg/l (U.S. Environmental Protection Agency, 2002).

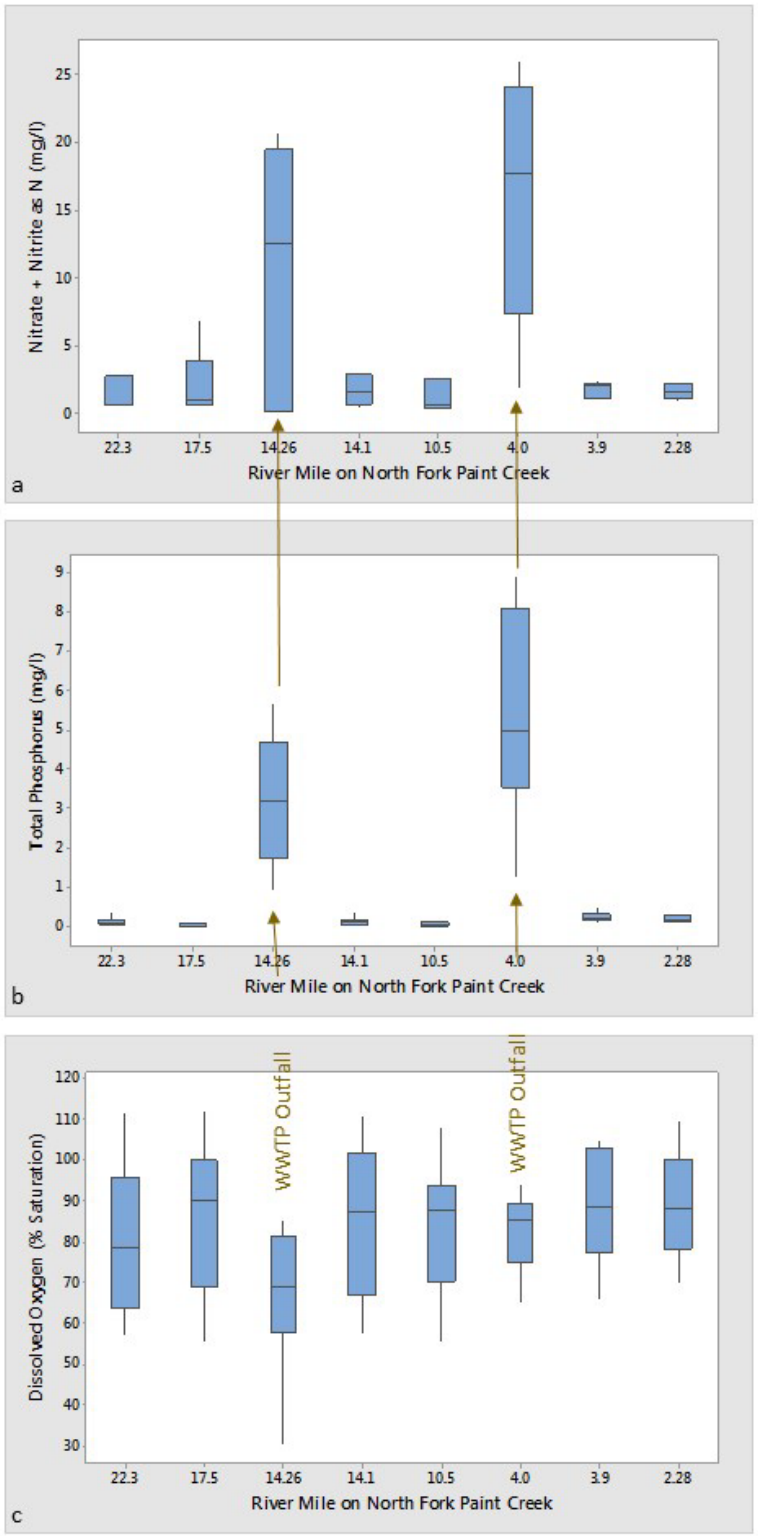

Figure 38. Water quality of North Fork Paint Creek samples collected June-October 2006 by the Ohio EPA for (a) nitrate and nitrite as nigtrogen, (b) total phosphorus, and (c) dissolved oxygen. The box represents the extent of the first quartile, median value, and third quartile; the lines represent minimum and maximum values with outliers represented as asterisks.

Final Assessment

All reaches meet the requirement of a free-flowing river with without impoundments, diversions, straightening, or other modifications of the river channel. In addition, all reaches meet the requirement associated with commercial, industrial, and other types of development with impervious surfaces less than 10% of the watershed and less than 10% of the area within 300 feet of the river (Table 9). Individual segements meet the remaining requirements, but the combination, or aggregate, of all reaches do not.

Two of the reaches, Paint Creek and North Fork Paint Creek, meet the minimum length requirement of 20 continuous river miles (Table 9). Rocky Fork Creek, which is continuous with Paint Creek, would provide additional length (Figure 39). Roads are permissible within 300 feet of the river but may not exceed more than 25% of the river length. Rattlesnake Creek and North Fork Paint Creek meet this requirement, but other segments do not (Table 9). For scenic river designation, forest and wetland should cover at least 25% of the length of the designated reach to a depth of 300 feet from both streambanks; a minimum of 50% of the remaining length of the designated reach should be in forest and wetland to a depth of 120 feet from both streambanks. Rattlesnake Creek meets both of these requirements (Table 9); Rocky Fork Creek meets the 300-ft requirement, and Paint Creek and North Fork Creek meet the 120-ft requirement (Table 9). While all segments classified as exceptional warmwater habitat exceed the minimum warmwater aquatic life uses, the Paint Creek segment is not in full attainment relative to that designation at all sample reaches (Table 8). Other segments in the Paint Creek watershed are in full attainment (Table 8).

No individual segment meets all requirements for the scenic river designation (Table 9). Considered in aggregate, Paint Creek and its tributaries do not meet all of the requirements for scenic designation either (Tables 12 and 13). However, within the aggregate, there is a 20.4-mile continuous reach of Paint Creek, from RM 5.3 downstream, near Chillicothe, to RM 26.2 upstream, west of Bourneville, that meets or exceeds all criteria for scenic river designation (Figure 39 and Tables 12 and 14).

Paint Creek from RM 5.3 downstream, near Chillicothe, to RM 26.2 upstream, west of Bourneville, includes a corridor dominated by agricultural and recreational uses. The area within 300 feet of the streambank is dominated by privately held land that is mostly in row crops, as well as large publically accessible areas owned and managed by governmental agencies (e.g., Ross County Park District's Buzzards Roost Nature Preserve) and private, non-governmental organizations (e.g., Arc of Appalachia's Junction Earthworks and the National Park Service's Seip Mound, part of the Hopewell Culture National Historical Park).

This reach is free-flowing over more than 96% of its course (Table 9) and includes some of the most impressive meanders along the mainstem (Figure 36). Roads are within 300 feet of the banks along just 25% of the reach (Table 9). As much as 28% of the 20.4-mile-long stream corridor has a forest land cover or is mapped as wetlands to a depth of 300 feet on both sides of the stream. Of the remaining corridor, 62% is forested or in wetland to a depth of 120 feet along both streambanks. This reach of Paint Creek is designated as exceptional warmwater habitat (Table 7) and is in full attainment at sampling sites within this reach (Table 8).

In summary, the 20.4-mile-long, continuous reach of Paint Creek, from RM 5.3 downstream, near Chillicothe, to RM 26.2 upstream, west of Bourneville (Figure 39), meets or exceeds all criteria for scenic river designation (Tables 12 and 14).

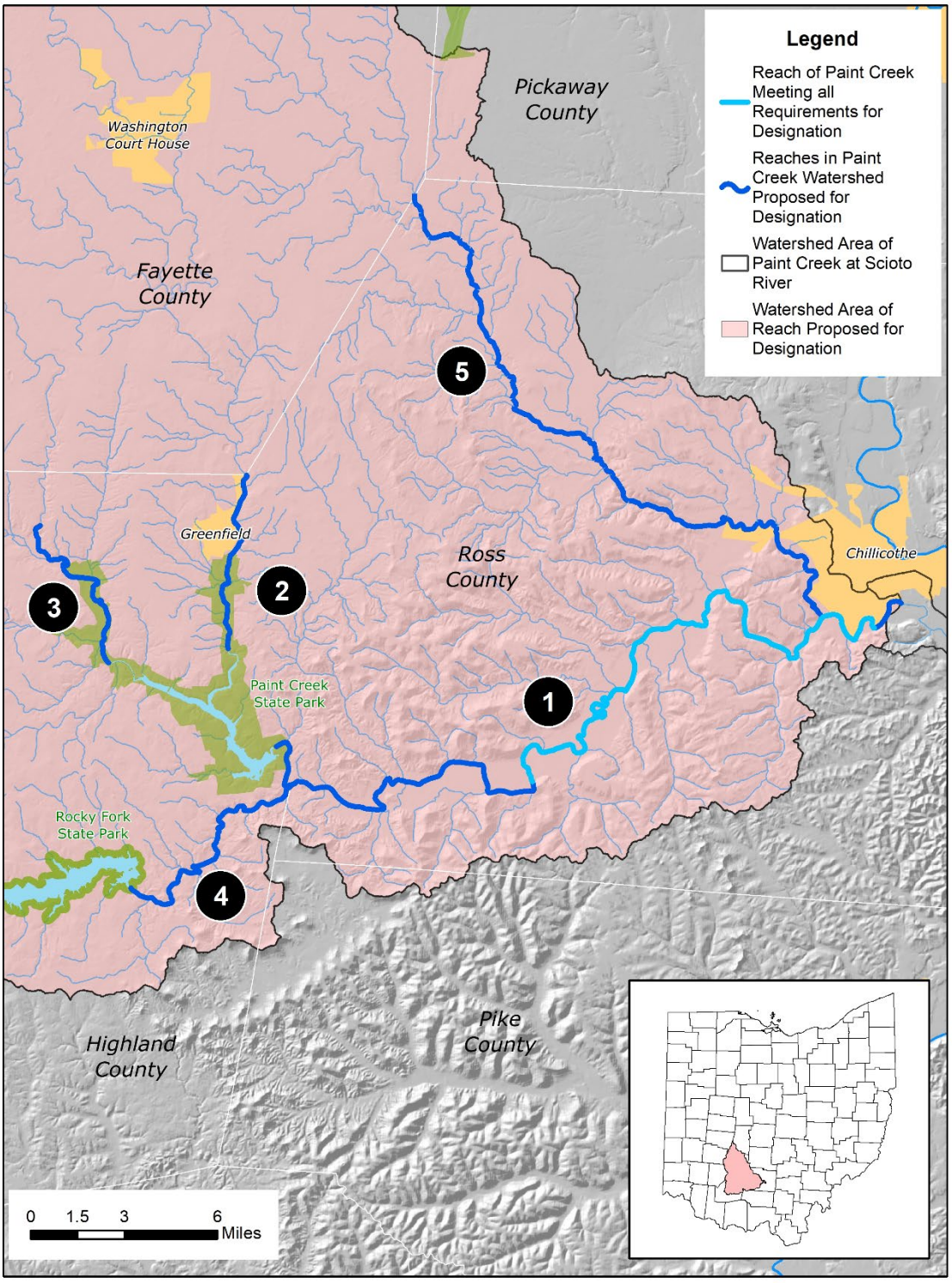

Figure 39. Five reaches of Paint Creek and its tributaries were examined for scenic river designation: 1 - Paint Creek, 2 - Upper Paint Creek, 3 - Rattlesnake Creek, 4 - Rocky Fork Creek, and 5 - North Fork Paint Creek. The reach of Paint Creek shown in light blue (RM 5.3-26.2), with a total length of 20.4 miles, meets all requirements for designation as an Ohio Scenic River. Reach and watershed statistics for each reach are summarized in Table 9.

Table 9. *Reach and watershed statistics relative to criteria for scenic river designation for Paint Creek in Ross County and its tributaries, Upper Paint Creek (above Paint Creek Lake), North Fork Paint Creek, and Rocky Fork Creek. Reach statistics are calculated based on 0.1-mile increments relative to the total reach length. Watershed statistics are based on watershed area upstream of an outlet located at the downstream end of the respective reach. Reach and watershed statistics are illustrated separately for the Paint Creek reach meeting scenic river criteria (RM 5.3-26.2), with a continuous length of 20.4 miles (the discrepancy in length between river miles and actual length is due to a meander cutoff between RM 22.5 and 23.3 that reduced actual river length).*

Segment	Reach Length (mi)	Watershed Area at Downstream End of Reach (mi^2)	Free-flowing (% of reach length)	Road within 300 ft of river (% of reach length)	Commercial land use with impervious areas within 300 ft (% of reach length)	Land use with impervious areas (% of watershed)	Forest or wetland within 300 ft on both sides (% of reach length)	Forest or wetland within 120 ft on both sides (% of reach length)*
1. Paint Creek (Paint Bridge at Rt 772 to tailwater of Paint Creek Lake and Dam)	34.8	1136.1	97	37	0	3.6	20	62
2. Upper Paint Creek (upstream of Paint Creek Lake to Fayette County line)	5.7	295.8	98	60	7	3.1	16	48
3. Rattlesnake Creek (upstream of Paint Creek Lake to south of East Monroe)	6.8	251.2	99	3	0	1.6	34	96
4. Rocky Fork Creek (confluence with Paint Creek to Rocky Fork Dam)	9.1	144.2	99	27	0	2.9	32	26
5. North Fork Paint Creek (confluence with Paint Creek to Fayette County line	25.3	234.2	84	18	6	1.8	11	56
Summary Statistics: All Stream Reaches Examined in this Study	81.7	1136.1	93	29	2	2.2	22	60
Summary Statistics: Reach Proposed for Designation - Paint Creek RM 5.3-26.2	20.4	1134.9	96	25	0	3.6	28	62

* Reach length for this calculation does not include the reach length with the 300-ft buffer of forest or wetland on both sides.

Table 10. *Criteria for scenic river designation compared to the existing condition on Paint Creek in Ross County from RM 3.9 on the downstream end and including data from all reaches shown in Figure 39 and included in Table 9, (i.e., Paint Creek in Ross County and its tributaries, Upper Paint Creek (above Paint Creek Lake), North Fork Paint Creek, and Rocky Fork Creek.*

Criteria	Existing Condition	Meets or Exceeds?
1. The proposed scenic river segment must be 75% ***free-flowing*** (i.e., existing or flowing in a natural channel condition without impoundments, diversions, straightening or other modifications of the river channel). The river must have ***connectivity to its natural floodplain*** along a majority of its length. Where such impacts have occurred, the river channel shall have been restored or recovered to the point of being capable of supporting a warmwater or coldwater habitat community.	Approximately 93% of proposed reach meets the free-flowing criterion.	Yes
2. ***Roads*** are permissible within 300 feet of the river but may not comprise more than 25% of the scenic river segment length.	Approximately 71% of proposed reach meets the road criterion; roads are within 300 feet along 29% of the proposed reach.	No
3. For maximum benefit, the ***total length of the designated section*** of the scenic river segment may be no less than 20 continuous river miles unless connected with segments bearing other designations.	Total length of proposed reach is 81.7 miles but does not meet all criteria along that length.	No
4. Some ***commercial, industrial and other types of development*** may occur within 300 feet of the river. However, this development shall not negatively impact the habitat and quality of the stream and its floodplain. No more than 10% of the river's watershed upstream and adjacent to the scenic river segment may be covered with ***impervious surfaces*** at the time of designation. If the upstream and adjacent watershed is at 10% impervious cover and is contained within an urbanizing area, then that river segment may not be considered for designation.	High intensity developed land (e.g., commercial and industrial uses) covers 0.2 % of the watershed and 2 % of the land within 300 feet of the river.	Yes
5. The area adjacent to at least 25% of the stream length, considering both banks, shall be in native forest or wetland outward from the river to a depth of 300 feet or greater. In addition, 50% of the remaining corridor shall be in ***native forest or wetland*** outward from the river to a depth of 120 feet or greater.	Approximately 22% of proposed reach meets 300-ft native forest or wetland criterion on both banks and 60% of the remaining reach meets 120-ft native forest or wetland criterion.	No
6. All of the scenic river segment must equal or exceed the Ohio EPA's ***warmwater or coldwater aquatic life use*** designations unless natural conditions (i.e. gradient or flow) within the river segment limit the stream's ability to attain these standards. The stream segment, however, must be performing to its highest potential with regard to biological diversity and water quality given the naturally occurring limitations. If the quality of the waters at any time falls below these criteria, a means to meet the criteria must be readily available and a pollution control and abatement plan must be developed to meet the criteria and be approved by the Ohio EPA.	Aquatic life use designation is exceptional warmwater habitat and the studied reaches are in both partial and full attainment.	No

Table 11. *Criteria for scenic river designation compared to the existing condition on Paint Creek in Ross County, from RM 5.3 at the downstream end, approximately 1.4 miles upstream of Paint Bridge in Chillicothe, to RM 26.2 at the upstream end, approximately 1.3 miles upstream of Bourneville. Watershed statistics are based on that portion of the Paint Creek watershed that contributes water to the downstream point on Paint Creek (RM 5.3). Reach statistics are based on the reach of Paint Creek proposed for designation as a scenic river (RM 5.3-26.2), though a meander cutoff between RM 22.5 and 23.3 reduced the river length by approximately 0.5 miles and was not counted.*

Criteria	Existing Condition	Meets or Exceeds?
1. The proposed scenic river segment must be 75% ***free flowing*** (i.e., existing or flowing in a natural channel condition without impoundments, diversions, straightening or other modifications of the river channel). The river must have ***connectivity to its natural floodplain*** along a majority of its length. Where such impacts have occurred, the river channel shall have been restored or recovered to the point of being capable of supporting a warmwater or coldwater habitat community.	Approximately 96% of proposed reach meets the free-flowing criterion.	Yes
2. ***Roads*** are permissible within 300 feet of the river but may not comprise more than 25% of the scenic river segment length.	Approximately 75% of proposed reach meets the road criterion; roads are within 300 feet along 25% of the proposed reach.	Yes
3. For maximum benefit, the ***total length of the designated section*** of the scenic river segment may be no less than 20 continuous river miles unless connected with segments bearing other designations.	Length of proposed reach is 20.4 miles, meeting the length criterion.	Yes
4. Some ***commercial, industrial, and other types of development*** may occur within 300 feet of the river. However, this development shall not negatively impact the habitat and quality of the stream and its floodplain. No more than 10% of the river's watershed upstream and adjacent to the scenic river segment may be covered with ***impervious surfaces*** at the time of designation. If the upstream and adjacent watershed is at 10% impervious cover and is contained within an urbanizing area, then that river segment may not be considered for designation.	Less than 3.6% of the watershed at the downstream point of the proposed reach is impervious and 0 % of the land within 300 feet of the river, meeting the impervious surface criterion.	Yes
5. The area adjacent to at least 25% of the stream length, considering both banks, shall be in native forest or wetland outward from the river to a depth of 300 feet or greater. In addition, 50% of the remaining corridor shall be in ***native forest or wetland*** outward from the river to a depth of 120 feet or greater.	Approximately 28% of proposed reach meets 300-ft native forest or wetland criterion and more than 74% of the proposed reach meets 120-ft native forest or wetland criterion.	Yes
6. All of the scenic river segment must equal or exceed the Ohio EPA's ***warmwater or coldwater aquatic life use*** designations unless natural conditions (i.e. gradient or flow) within the river segment limit the stream's ability to attain these standards. The stream segment, however, must be performing to its highest potential with regard to biological diversity and water quality given the naturally occurring limitations. If the quality of the waters at any time falls below these criteria, a means to meet the criteria must be readily available and a pollution control and abatement plan must be developed to meet the criteria and be approved by the Ohio EPA.	Aquatic life use designation is exceptional warmwater habitat and proposed reach is in full attainment.	Yes

Findings and Recommendation

Paint Creek, including its tributaries North Fork Paint Creek and Rattlesnake Creek in Ross County, Upper Paint Creek upstream of Paint Creek Lake along the border between Ross and Highland Counties, and Rocky Fork Creek downstream of Rocky Fork Lake in Highland County, is recommended for designation as an Ohio Scenic River.

Unique or distinctive characteristics of Paint Creek and its tributaries that are of state significance are numerous:

- Paint Creek watershed includes two major physiographic provinces separated by the Allegheny Escarpment, the most distinctive topographic characteristic in Ohio. The contrast between, and view from, the flat plains in the northwest to the rugged hills in the southeast is the result of differences in geology and its influence on topography prior to and following glaciation. The boundary between glaciated and nonglaciated parts of Ohio also lies within the watershed. This has created a striking and scenic contrast in stream channel and valley morphology across the watershed. The geology of the Paint Creek watershed, including the impacts of glaciation and the differences between the two major physiographic regions, contributes to habitat heterogeneity within the streams of the Paint Creek Watershed, thus increasing the biological diversty of the entire system.

- Stream corridors of Paint Creek and its tributaries are dominated by cultivated crops, hay, pasture, and forested land covers, retaining many of the aesthetic qualities of a rural river system at the time of settlement of Ohio. This is accentuated by the natural meandering of Paint Creek, its extent across valley bottoms, and its pervasiveness along the stream corridor. Valleys of these streams are broad and flat with distinct uplands along valley walls. Streams within these valleys are currently meandering, with a legacy of meandering on their floodplains and terraces. This contributes to the sinuosity of the streams within the Paint Creek system, resulting in well-developed riffles, pools, run complexes, and other in-stream habitat features that increase the biological diversity of the system.

- Paint Creek watershed provides critical habitat for many state and federal listed species of both flora and fauna, and protected areas along the stream corridor aid in the long-term maintenance of these populations. The diverse topography, geology, and geologic history of the Paint Creek watershed and its tributary streams provide a diversity of habitat for plants and animals. At least 11 state-listed endangered species of mussels, fish, and plants have been found in the Paint Creek watershed in recent surveys. Two of the mussel species, the snuffbox mussel (*Epioblasma triquetra*) and the rayed bean mussel (*Villosa fabalis)*, are also on the federal list of endangered species.

- Human occupation of the stream valleys of the Paint Creek watershed has been semi-continuous since Paleoindian time, and the area is recognized for its significance to early history of the region. The concentration of ceremonial and burial earthworks suggests it was the center of the Hopewell Culture, and artifacts and raw material excavated from Adena and Hopewell sites indicate a network of trade across the United States and Canada. During Historic Native American Indian time, the home of the Shawnee leader was traditionally known as Chillicothe; at least one location in the watershed, at present-day Frankfort along North Fork Paint Creek, was known as Chillicothe. Modern Chillicothe was Ohio's first state capital.

- The concentration and expression of Woodland Indian ceremonial and burial earthworks is superlative. The Hopewell Culture is defined by earthworks located in Ross County, including those in the Paint Creek watershed. Hopewell Mound Group, along the banks of North Fork Paint Creek, and Seip Earthworks, along the banks of, and accessible by canoe from, Paint Creek, are nominated as World Heritage sites. The nomination states that "Ohio's Hopewell earthworks are the pre-eminent examples, and the largest concentration in the world, of prehistoric monumental landscape architecture" (World Heritage Ohio, 2018).

- The concentration of protected land along Paint Creek and its tributaries-Rattlesnake Creek, Rocky Fork Creek, and North Fork Paint Creek-is exceptional. Significant areas of the watershed, many of them within the riparian corridor, are protected, managed, and made accessible by the National Park Service (e.g., Hopewell sites), Arc of Appalachia's Highlands Nature Sanctuary (e.g., Hopewell sites and nature areas), Ohio Department of Natural Resources (state parks, nature preserves, and wildlife areas), and Ross County Parks system (nature preserves, bike trail, and recreational sites).

Finally, Paint Creek in Ross County, from RM 5.3 downstream near Chillicothe to RM 26.2 upstream west of Bourneville, a distance of 20.4 miles, meets or exceeds all criteria established by Ohio Revised Code 1547.81 for scenic river designation. It is recommended for designation as an Ohio Scenic River. It is further recommended that the designation include a total of 81.7 miles on Paint Creek (RM 3.9 to RM 39.2) and Upper Paint Creek (RM 46.5 to RM 52.2) and its tributaries-Rattlesnake Creek (RM 4.0 to RM 10.8), Rocky Fork Creek (RM 0.0 to RM 9.1), and North Fork Paint Creek (RM 0.0 to RM 25.3)-in Ross and Highland counties.

Acknowledgements

Many people contributed their time and talent to the development of this report. They shared their passion for protecting the Paint Creek, North Fork Paint Creek, Rocky Fork Paint Creek, and Rattlesnake Creek for future generations and their assistance was invaluable.

Funding for the study was provided by contributions from the following:

- Greenfield Eagles, $5,000
- Highland County Trails, $500
- Rivers Unlimited, $3,100
- Shawn Rourke, $300

The ODNR Division of Natural Areas and Preserves thanks the following individuals for their contributions to the creation of this study and the potential designation of the Paint Creek, North Fork Paint Creek, Rocky Fork Paint Creek, and Rattlesnake Creek as an Ohio Scenic River. These individuals garnered support, collected data, contributed to the report and, most importantly, built a conservation initiative for the river.

- Bainbridge Lions Club
- Tony Bresnen, ODNR Division of Geological Survey
- Kelly Capuzzi, Ohio EPA, Southeast District Office
- Chillicothe Branch of The American Association of University Women
- Chillicothe/Ross League of Women Voters
- Chillicothe Trails
- Philip Clyburn, City of Greenfield, Village Council Member
- Heidi Hetzel-Evans, ODNR, Division of Parks and Watercraft
- Bob Gable, ODNR Scenic Rivers Program Manager
- Rick Gardner, ODNR Division of Natural Areas and Preserves
- Steven Grey, ODNR Deputy Director
- Dr. Michael Hoggarth, Otterbein University
- Jeff Johnson, Chief, ODNR Division of Natural Areas and Preserves
- Greg Lipps, Ohio Biodiversity Conservation Partnership, The Ohio State University
- Ty McBee, Adena Health System
- Carolyn Mestemaker, ODNR Scenic Rivers Program
- Dr. John Ritter, Wittenberg University
- Ross County Park District
- Aaron Rourke, ODNR Scenic Rivers Program
- Charles Salmons, ODNR Division of Geological Survey
- Dwayne Seeling, Waters Edge Canoe Livery
- Matthew Shumar, Ohio Bird Conservation Initiative, The Ohio State University
- Christine Szymanski, ODNR Scenic Rivers Program
- Brian Zimmerman, Stream and River Ecology Lab, The Ohio State University

This study and the possible designation of the Paint Creek, North Fork Paint Creek, Rocky Fork Paint Creek, and Rattlesnake Creek as an Ohio Scenic River could not have been completed without the complete support of the local political subdivisions of Highland and Ross counties. Resolutions or letters of support were issued by the following political subdivisions in each county:

Highland County

- Buckskin Township Trustees
- Highland County Board of Commissioners

- Highland County Engineer
- Madison Township Trustees
- Village of Greenfield

In addition to these resolutions several organizations in Highland County also submitted letters of support as follows:

- Arc of Appalachia
- Greenfield Products Inc.
- Greenfield Research Inc.
- Greenfield Rotary Club
- Highland County Chamber of Commerce
- Visitors Bureau of Highland County on behalf of Highland County Trail Association
- Visitors Bureau of Highland County on behalf of the Village of Greenfield

Ross County

- Paint Township (Letter of non-opposition)

In addition to these resolutions, several organizations in Ross County also submitted letters of support as follows:

- Adena Health System
- The League of Women Voters of Chillicothe and Ross County

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Appendix

Resolutions and Letters of Support

Union Township
Ross County, Ohio
PO Box 6071
Chillicothe, Ohio 45601

Aaron Rourke
Scenic River Coordinator
Division of Natural Areas and Preserves
1750 Osborn Rd.
Wilmintgon, Ohio 45177

Dear Sir:

To approve Resolution Requesting the Department of Natural Resources , Division of Natural Areas and Preserves to consider the Designation of Paint Creek and Tributaries as a State Scenic River Under the State Scenic Rivers System and Declaring Intent to Cooperate with the Department of Natural Resources. Other Agencies and Other Units of Government in the protection and Enhancement of Paint Creek and Designated Tributaries as a Designated State Scenic River and :

NOW THEREFOR , Be it Resolved by the Trustees of Union Township, Ross County, State of Ohio,hereby request the Director of the Department of Natural Resources consider the designation of Paint Creek and the Specified tributaries as an Ohio State Scenic River as they meet the criteria for such designation Pursuant to Section 1547.81 et seq of Ohio Revised Code.

This Resolution shall take effect and be in force from and after the earliest period as provided by law.

Union Township has no financial commitment at this time.

Sincerely Submitted

Union Township
Board of Trustees

Harold W. Bennett

Harold W. Bennett
Board Member

BUCKSKIN TOWNSHIP
RESOLUTION 21-20
Ohio Scenic River Designation for Paint Creek

WHEREAS, the Buckskin Township Board of Trustees desires to support the effort by ODNR, Division of Watercraft, Scenic Rivers Program to designate the sections of Paint Creek that travel through Buckskin Township as a Scenic River.

WHEREAS, Sections 1547.01, 1547.51, 1547.52, 1547.81, 1547.82, 1547.83, 1547.84, 1547.85, 1547.86, and 1547.87 of the Ohio Scenic River Law defines the impact of said designation by ODNR; therefore, be it

RESOLVED, the Board of Township Trustees of Buckskin Township, Ross County, Ohio, supports the designation for Paint Creek as a Scenic River within the Township boundaries under the following understanding:

1. The Scenic River law does not affect the use of private property. Residents can do anything after the designation that they did before the designation existed. No restrictions will be added.

2. The public cannot access private property without permission.

3. This designation will draw positive attention to Paint Creek. More people will take care of it, and funding may become available for clean-up activities.

4. The ultimate goal is to protect the natural qualities of Paint Creek so present and future generations may experience its natural beauty and ecological values. (Ohio's Scenic Rivers Program)

MOTION BY: Larry Olaker

SECONDED BY: Mark Massie

Vote: Bart Barton - aye

Larry Olaker - aye

Mark Massie - aye

Adopted this 28th day of June 2021.

From:	Rourke, Aaron
To:	Gable, Robert
Subject:	Letter of support from League of Women Voters
Date:	Tuesday, March 16, 2021 1:18:54 PM

Letter of support -

From: Chillicothe-Ross League of Women Voters <participate@lwvchillicothe.org>
Sent: Tuesday, March 16, 2021 10:31 AM
To: Rourke, Aaron <Aaron.Rourke@dnr.ohio.gov>
Subject: Paint Creek as a Scenic Waterway

To: Aaron Rourke
SW Ohio Scenic River Manager
Division of Natural Areas and Preserves(ODNR)

Dear Mr. Rourke,

This letter is to advise you that the League of Women Voters of Chillicothe and Ross County supports the designation of Paint Creek and its tributaries as a Scenic Waterway. League has since 1955 supported policies and procedures that provide for cooperative planning and administration along watershed lines and across political boundaries. We have hosted educational programming and community outreach regarding the value of clean water policies and protecting our rivers and are a willing partner for educational outreach.

Ross County has been a cradle of important social and economic decision making for thousands of years. We are a community on the verge of acquiring UNESCO World Heritage Designation to celebrate and protect our numerous mound sites and hope that the Scenic River designation for Paint Creek can also help protect and celebrate our precious waterways. This combination of tributaries flows through unique geological terrain and is home to rare fish and fauna. It is also a source of recreation for residents and visitors.

Members of our committee have spoken to residents along the creek who mainly had concerns about restrictions to using their properties. The FAQ handout from ODNR provided excellent responses to their concerns. We all hope that Scenic designation will lead to better education about appreciation and maintenance of this jewel. Members of the League are proud to be consistent supporters of environmental and educational issues that improve the wellbeing of our community.

Respectfully submitted from the Chillicothe Ross League of Women Voters

Sarah Skinner
President

February 15, 2021

Ohio Department of Natural Resources
2045 Morse Road – Building D-3
Columbus, Ohio 43229

RE: Request for Designation

To Whom It May Concern:

We are writing to you on behalf of the Village of Greenfield to express our support in designating the area of Paint Creek Lake to Greenfield, Ohio as a "scenic/recreational" waterway. We understand the environmental and economic benefits of such a designation.

River systems designated "scenic/recreational" in other Ohio counties have demonstrated increases in ecotourism and increased property values respectively. Our community would also benefit from increases in tourism and from the subsequent increased tax revenue and job creation.

We commend the efforts of the Village of Greenfield and ask that you please consider advancing their proposal to designate this segment of Paint Creek as a "scenic/recreational" waterway in Ohio's Scenic River Program.

Thank you for your consideration in this important local effort.

Sincerely,

Jamie Wheeler

Jamie Wheeler
Executive Director

Visitors Bureau of Highland County Board of Directors
Casey McIntosh, President
Phil Clyburn, Vice President
Richard Hiatt, Treasurer
Elizabeth Brennfleck, Secretary
Ron Coffey
Sharon Hughes
Dan Pearce
Todd Wilkin

338 WEST MAIN STREET • P.O. BOX 183 • HILLSBORO, OHIO 45133 • 937.393.1111 OFFICE • 937.393.9604 FAX • WWW.VISITHIGHLANDCOUNTY.COM

HIGHLAND COUNTY OF COMMERCE
Chamber

February 15, 2021

Ohio Department of Natural Resources
2045 Morse Road – Building D-3
Columbus, Ohio 43229

RE: Request for Designation

To Whom It May Concern:

We are writing to you on behalf of the Village of Greenfield to express our support in designating the area of Paint Creek Lake to Greenfield, Ohio as a "scenic/recreational" waterway. We understand the environmental and economic benefits of such a designation.

River systems designated "scenic/recreational" in other Ohio counties have demonstrated increases in ecotourism and increased property values respectively. Our community would also benefit from increases in tourism and from the subsequent increased tax revenue and job creation.

We commend the efforts of the Village of Greenfield and ask that you please consider advancing their proposal to designate this segment of Paint Creek as a "scenic/recreational" waterway in Ohio's Scenic River Program.

Thank you for your consideration in this important local effort.

Sincerely,

Jamie Wheeler

Jamie Wheeler
Executive Director

The Highland County Chamber
The Highland County Chamber of Commerce
TheHighlandChamber.com
PO Box 183 Hillsboro, OH 937.393.1111 info@thehighlandchamber.com

Ohio Department of Natural Resources
2045 Morse Rd Bld. D-3
Columbus, Ohio 43229

To Whom it May Concern:

We are writing you on behalf of the Highland County Trail Association to express our support in designating Paint Creek from Paint Creek Lake to Greenfield, Ohio as a "scenic/recreational" waterway. We understand the environmental and economic benefits of such designation.

River systems designated "scenic/recreational" in other Ohio counties have demonstrated increases in ecotourism and increased property values respectively. Our community would also benefit from increases in tourism and from subsequent increased tax revenue and job creation.

We commend the efforts of the Highland County Trail Association and ask that you please consider advancing their proposal to designate this segment of Paint Creek as a "scenic/recreational" waterway in Ohio's Scenic River Program. Thank you for your consideration in this important local effort.

Sincerely,

Melissa Elmore

Melissa Elmore, Executive Director

HUNTINGTON TOWNSHIP
RESOLUTION 2.10.2021
Ohio Scenic River Designation for Paint Creek

WHEREAS, the Huntington Township Board of Trustees desires to support the effort by ODNR, Division of Watercraft, Scenic Rivers Program to designate the sections of Paint Creek that travel through Huntington Township as a Scenic River.

WHEREAS, Sections 1547.01, 1547.51, 1547.52, 1547.81, 1547.82, 1547.83, 1547.84, 1547.85, 1547.86, and 1547.87 of the Ohio Scenic River Law defines the impact of said designation by ODNR; therefore, be it

RESOLVED, the Board of Township Trustees of Huntington Township, Ross County, Ohio, supports the designation for Paint Creek as a Scenic River within the Township boundaries under the following understanding:

1. The Scenic River law does not affect the use of private property. Residents can do anything after the designation that they did before the designation existed. No restrictions will be added.

2. The public cannot access private property without permission.

3. This designation will draw positive attention to Paint Creek. More people will take care of it, and funding may become available for clean-up activities.

4. The ultimate goal is to protect the natural qualities of Paint Creek so present and future generations may experience its natural beauty and ecological values. (Ohio's Scenic Rivers Program)

MOTION BY: John Cottrill

SECONDED BY: Gary Hopkins

Vote: John Cottrill

Gary Hopkins

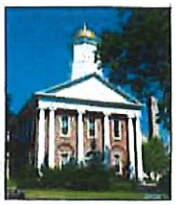
Larry Kellough

Adopted this 10th day of February 2021.

HIGHLAND COUNTY
1975 ADMINISTRATION BUILDING
-1976

Highland County Board of Commissioners
119 GOVERNOR FORAKER PLACE, SUITE 211
HILLSBORO, OHIO 45133-1161
Phone 937-393-1911 Fax 937-393-5850
www.co.highland.oh.us

JEFF DUNCAN
TERRY BRITTON
DAVID DANIELS
NICOLE OBERRECHT, CLERK
MARY REMSING, CLERK



HIGHLAND COUNTY COURTHOUSE
1832-1834
OHIO'S OLDEST COURTHOUSE IN
CONTINUOUS USE

December 30, 2020

To Whom It May Concern:

RE: Paint Creek Scenic Riverway

We are writing to you to express our support in designating a section of North Fork Point Creek, Rattlesnake Creek, Rocky Fork Creek, and upper Paint Creek as a "scenic/recreational" waterway. We understand the environmental and economic benefits of such a designation.

River systems designated "scenic/recreational" in other Ohio counties have demonstrated increases in ecotourism and increased property values respectively. Our community would also benefit from increased tourism and from subsequent increased tax revenue and job creation.

We commend the efforts of Councilman Clyburn and ask that you please consider advancing their proposal to designate this segment of Paint Creek as a "scenic/recreational" waterway in Ohio's Scenic River Program. Thank you for your consideration in this important local effort.

Regards,

Jeff Duncan

Terry Britton

David Daniels

MADISON TOWNSHIP TRUSTEES
HIGHLAND COUNTY, OHIO

Township Community Building
12646 Centerfield Road
GREENFIELD, OHIO 45123

TRUSTEES
Bruce Baird 981-2070
Bill Buck 981-285
Daniel Mathews 937-763-8715

ZONING INSPECTOR
Steve Speakman 937-763-9249

Send all correspondence to:

Sherri Beatty, Fiscal Officer
11255 State Route 753 South
Greenfield, Ohio 45123
Phone 981-4310

December 21, 2020

TO WHOM IT MAY CONCERN:

This letter will serve as our support to the enlarged scenic waterway that includes portions of Rattlesnake and additional surrounding areas.

Should you have any questions, feel free to contact us.

Sincerely,

Bruce Baird

Daniel C. Mathews

Bruce Baird
Bill Buck
Daniel Mathews
Madison Township Trustees

BB:BB:DM:sb

November 30, 2020
Re: Scenic River Designation for Paint Creek and selected tributaries

Dear Phillip Clyburn,

The Highlands Nature Sanctuary, Inc. (dba Arc of Appalachia Preserve System) strongly supports the Scenic River designation of Paint Creek and its selected tributaries, which include Rocky Fork Creek. The Arc of Appalachia (the Arc) is dedicated to protecting the rich diversity of life within North America's Great Eastern Forest. The mission of the Ohio Scenic Rivers Program is in line with our non-profit's preservation goals.

To date, the Arc has raised over sixteen million dollars for forest conservation. We steward nearly 7000 acres across twenty preserve regions. 3,100 of those acres are within the Highlands Nature Sanctuary region. The Highlands Nature Sanctuary was the first of the Arc's preserves, initially founded in 1995 to save 7 Caves, a cave park and botanical hotspot in the Rocky Fork Gorge. Later, our mission expanded to form a protected forest corridor along the lower Rocky Fork Gorge, its side tributaries, and the Paint Creek watershed near its confluence with Rocky Fork. Our master plan is to connect Rocky Fork State Park with Paint Creek State Park along a contiguous ten-mile-long protected forested corridor.

The Rocky Fork Gorge is renowned as a 100-foot-deep karst canyon with stunning rock formations and spectacular wildflower displays. It has a rich mussel population for the size of its watershed and provides hibernacula for four species of bats in its network of 23 caves and grottos. To date, 1200 acres of the Highlands Nature Sanctuary have been formally designated as a dedicated state nature preserve. Rocky Fork Creek's inclusion in the dedication of Paint Creek's Scenic River designation would further protect the water quality and the intact aquatic ecosystems of the Rocky Fork.

Sincerely,

Nancy Stranahan

Nancy Stranahan, Director
Highlands Nature Sanctuary/ dba Arc of Appalachia Preserve System
7660 Cave Road, Bainbridge, OH 45612
Information Line: 937-365-1935 Cell Phone: 937-365-1489

HIGHLAND COUNTY ENGINEER

CHRISTOPHER M. FAUBER, P.E., P.S. — COUNTY ENGINEER
CHRISTIAN R. DUNLAP, E.I.T. — DEPUTY ENGINEER
JERRY MILLER — SUPERINTENDENT

138 BOWERS AVE • P.O. BOX 297 • HILLSBORO, OHIO 45133 • 937 393-3496 • FAX 937 393-3498

November 18, 2020

To Whom It May Concern;

The Highland County Engineer supports the designation of a scenic waterway comprised of the sections of North Fork Paint Creek, Rattlesnake Creek, Rocky Fork Creek and Paint Creek. This only applies to the sections of those creeks that lie within the borders of Highland County. Scenic Rivers are proven economic drivers, contributing to an increase in recreational tourism and lifting property values. This will become one of the largest scenic waterways in the State of Ohio and the only one in the Appalachian Region.

Sincerely,

Christopher M. Fauber
Highland County Engineer

October 13, 2020

The Paint Township Trustees will not oppose the designation of a scenic waterway comprised of a section of North Fork Paint Creek, Rattlesnake Creek, Rocky Fork Creek, Paint Creek and upper Paint Creek (above Paint Creek Lake). This only applies to the sections of those creeks that lie within the border of Paint Township. This will become one of the largest scenic waterways in the state of Ohio and the only one in the Appalachian Region.

Sincerely,

Paint Township Trustees

October 14, 2020

Randy Mustard

Colley Miller

Steve M Lamb

GREENFIELD PRODUCTS, INC.
EST. 1959
"specializing in recreational boat anchors"
P.O. Box 99 • 1230 North Washington Street • Greenfield, Ohio 45123
Phone (937) 981-2696 • Fax (937) 981-3466

October 31, 2016

Ohio Department of Natural Resources
2045 Morse Road
Building D-3
Columbus, OH 43229

To Whom It May Concern:

On behalf of the Highland County Trail Association, Greenfield Products, Inc. is writing to express our support for the proposed designation of Paint Creek Lake as a "Scenic/Recreational Waterway".

In addition to the clear economic benefits of tourism, we believe that increased recreational opportunities will also help attract new residents to the region. For many, particularly 'millennials", outdoor recreation and lifestyle activities are increasingly important factors in choosing locations to begin careers and raise families.

As manufacturers, we would welcome an influx of people to the region, as it improves the pool of prospective job candidates and helps local businesses attract and retain career-track individuals.

Greenfield Products wholeheartedly supports this initiative.

Yours truly,

Ann G. Pence
President

272 Hospital Road
Chillicothe, OH 45601
(740)779-7500
www.adena.org

October 28, 2016

To: Ohio Department of Natural Resources
2045 Morse Road Building
D-3 Columbus, Ohio
43229

Re: Paint Creek Scenic Waterway Designation

To Whom It May Concern:

On behalf of Adena Health System, I am pleased to express support of the Highland County Trail Association's proposal to designate Paint Creek as a "scenic/recreational" waterway. We appreciate the environmental and economic benefits such a designation could provide to the Highland County area.

The vision of Adena Health System is to be instrumental in creating healthy, thriving communities. We believe that supporting and improving the visibility of the recreational opportunities in the region that help the population in maintaining health is a key strategy to achieve that vision. The Paint Creek scenic designation would do just that.

Please consider advancing their scenic waterway designation proposal to the Ohio's Scenic River Program. We thank you for your consideration in helping this local effort.

Sincerely,

John Fortney, M.D.
Interim CEO, Adena Health System

Greenfield Rotary Club

P.O. Box 102 • Greenfield, Ohio 45123

October 6, 2016

Ohio Department of Natural Resources
2045 Morse Road-Bldg. D-3
Columbus, Ohio 43229

To Whom It May Concern:

We are writing to you on behalf of the Highland County Trail Association to express our support in designating Paint Creek from Paint Creek Lake to Greenfield, Ohio as a "scenic/recreational" waterway. We understand the environmental and economic benefits of such a designation.

River systems designated "scenic/recreational" in other counties have demonstrated increases in ecotourism and increased property values respectively. Our community would also benefit from increases in tourism and from the subsequent increased tax revenue and job creation.

We commend the efforts of the Highland County Trail Association and ask that you please consider advancing their proposal to designate this segment of Paint Creek as a "scenic/recreational" waterway in Ohio's Scenic River Program. Thank you for your consideration in this important local effort.

Sincerely,

Virginia Purdy
Rotary President
District #6670 / Club #3629
Greenfield, Ohio 45123

Office of Village Council

Village of Greenfield
300 Jefferson Street
P. O. Box 300
Greenfield, Ohio 45123

September 22, 2016

Ohio Department of Natural Resources
2045 Morse Road, Bldg. D-3
Columbus, Ohio 43229

To Whom It May Concern:

On behalf of the Greenfield Village Council, I am writing to express our support in designating a section of Paint Creek from Paint Creek Lake to Greenfield, Oho as a "Scenic/Recreational" Waterway. We understand the environmental and economic benefits of such a designation and support the efforts of the Highland County Trail Association to promote this beautiful natural asset.

River systems designed "Scenic/Recreational" in other Ohio counties have demonstrated increases in ecotourism and increased property values respectively. We believe our community would also benefit from increases in tourism and from the subsequent increased tax revenue and job creation.

We commend the efforts of the Highland County Trail Association and ask that you please consider advancing their proposal to designate this segment of Paint Creek as a "Scenic/Recreational" Waterway in Ohio's Scenic River Program.

Thank you for your consideration of this important local effort.

Sincerely,

Betty Jackman

Betty Jackman
Chairwoman of Council
Village of Greenfield

PC:RC/rk

GREENFIELD RESEARCH, INC.
BOX 239 - 347 EDGEWOOD AVENUE
GREENFIELD, OHIO 45123

PHONE: 937-981-7763
FAX: 937-981-3763

September 14, 2016

Ohio Department of Natural Resources
2045 Morse Road – Bldg. D-3
Columbus, OH 43229

To Whom It May Concern:

We are writing to you on behalf of the Highland County Trail Association to express our support in designating Paint Creek from Paint Creek Lake to Greenfield, Ohio as a "scenic/recreational" waterway. We understand the environmental and economic benefits of such a designation.

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We commend the efforts of the Highland County Trail Association and ask that you please consider advancing their proposal to designate this segment of Paint Creek as a "scenic/recreational" waterway in Ohio's Scenic River Program. Thank you for your consideration in this important local effort,

Sincerely,

Michael Penn
President
Greenfield Research, Inc.

HIGHLAND COUNTY
ADMINISTRATION BUILDING
1975-1976

Highland County Board of Commissioners
119 GOVERNOR FORAKER PLACE, SUITE 211
HILLSBORO, OHIO 45133-1161
Phone 937-393-1911 Fax 937-393-5850
www.co.highland.oh.us
SHANE WILKIN
TOM HORST
JEFF DUNCAN
RHONDA SMALLEY, CLERK

HIGHLAND COUNTY COURTHOUSE
1832-1834
OHIO'S OLDEST COURTHOUSE IN
CONTINUOUS USE

September 7, 2016

Ohio Department of Natural Resources
2045 Morse Road – Bldg. D-3
Columbus, OH 43229

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Regards,

Thomas Horst

Jeff Duncan

Board of County Commissioners
Highland County, Ohio

VISITORS BUREAU OF
Highland County

September 7, 2016

Ohio Department of Natural Resources
2045 Morse Road – Building D-3
Columbus, Ohio 43229

RE: Request for Designation

To Whom It May Concern:

We are writing to you on behalf of the Highland County Trail Association to express our support in designating the area of Paint Creek Lake to Greenfield, Ohio as a "scenic/recreational" waterway. We understand the environmental and economic benefits of such a designation.

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Thank you for your consideration in this important local effort.

Sincerely,

Destiny Bryson /s/

Destiny Bryson, Executive Director
and
Visitors Bureau of Highland County Board of Trustees
Tom Horst, President
Tim Koehl, Vice President
Kim Abbott, Secretary
Janet Shawhan, Board Member
Ron Coffey, Board Member
Phil Clyburn, Board Member
Debra Crago, Board Member
Sharon Hughes, Board Member
Sharon Bedard, Board Member
Joe Mahan, Board Member

VISITORS BUREAU OF
Highland County

September 7, 2016

Ohio Department of Natural Resources
2045 Morse Road – Building D-3
Columbus, Ohio 43229

RE: Request for Designation

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Phil Clyburn, Board Member
Debra Crago, Board Member
Sharon Hughes, Board Member
Sharon Bedard, Board Member
Joe Mahan, Board Member

VBHC•130 South High Street, Hillsboro, Ohio 45133 • (937) 763-7012 phone • www.highlandcounty.com

September 1, 2016

Ohio Department of Natural Resources
2045 Morse Road – Bldg. D-3
Columbus, Ohio 43229

To Whom It May Concern:

We are writing to you on behalf of the Highland County Trail Association to express our support in designating Paint Creek from Paint Creek Lake to Greenfield, Ohio as a "scenic/recreational" waterway. We understand the environmental and economic benefits of such a designation.

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Sincerely,

Buckskin Twp. Trustees

Robert W. Stiles

Larry Oliver

Bert E Boston