In This Section

- River Basin Description
- Population and Land Use
- Local Governments and Planning Authorities
- Water Use Classifications

Section 2

River Basin Characteristics

This section describes the major characteristics of the Tallapoosa River basin including the following:

- *River basin description* (Section 2.1): the physical features and natural processes of the basin.
- *Population and land use* (Section 2.2): the sociological features of the basin, including the types of human activities which may impact water quality and water resource use.
- *Local governments and planning authorities* (Section 2.3): identification and roles of the local authorities within the basin.
- *Water use classifications* (Section 2.4): description of uses and baseline goals for management of waters within the basin as defined in the state regulatory framework.

2.1 River Basin Description

This section describes the important geographical, geological, hydrological, and biological characteristics of the Tallapoosa River basin.

The physical characteristics of the Tallapoosa River basin include its location, physiography, soils, climate, surface water and ground water resources, and natural water quality. These physical characteristics provide the natural template which influences the basin's biological habitats, and the way in which people use the basin's land and water resources.

2.1.1 River Basin Boundaries

The main streams of the Tallapoosa River basin within Georgia are the Tallapoosa River itself and the Little Tallapoosa River. The Tallapoosa River originates in Paulding County west of Atlanta, while the tributary Little Tallapoosa River originates slightly to the south, in Carroll County (Figure 2-1). Across the Georgia-Alabama state line, both

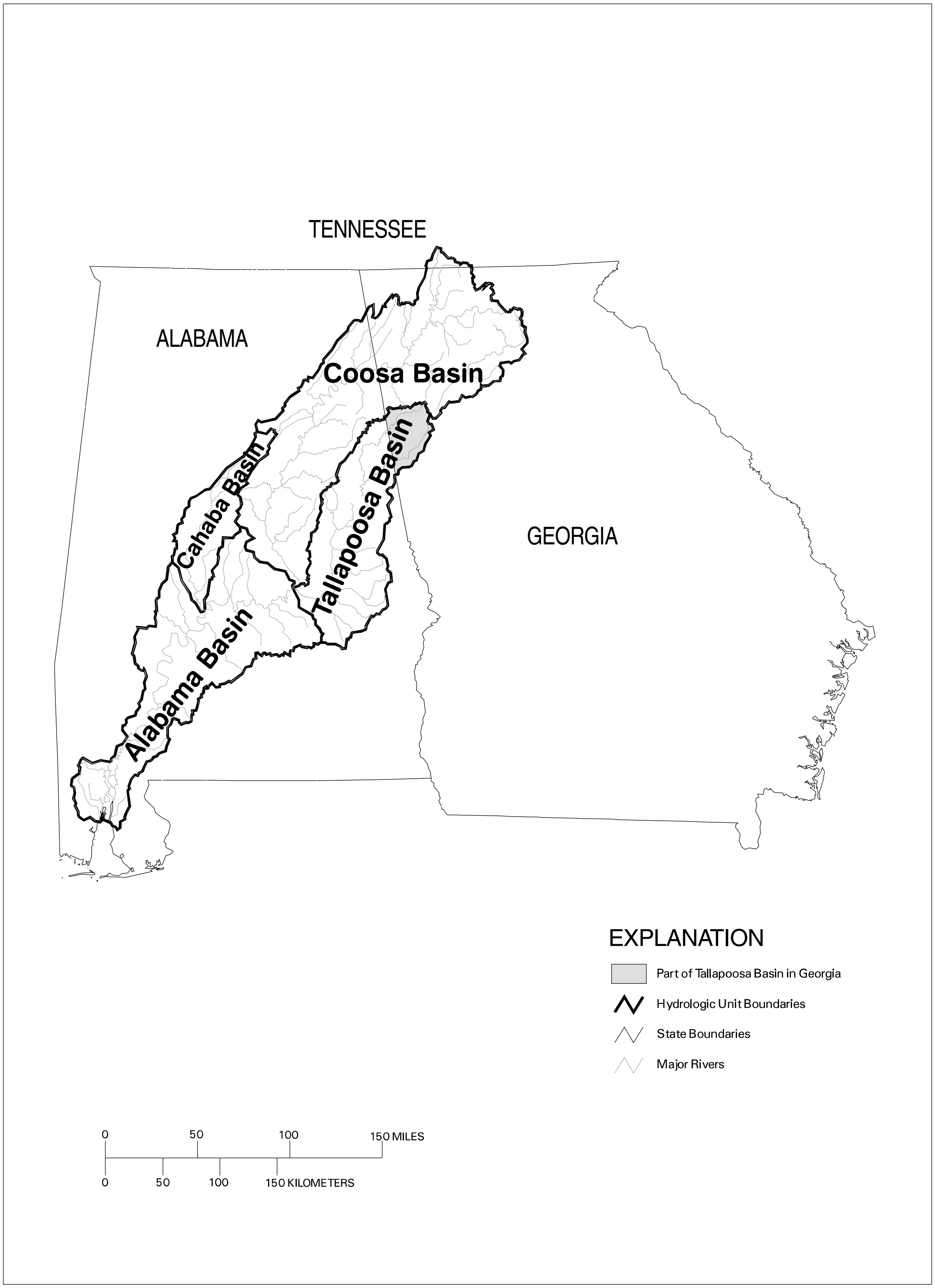

Figure 2-1. Location of the Tallapoosa River Basin

rivers flow through northeast Alabama. The Tallapoosa River basin or watershed, comprising all land areas draining into the river, occupies a total area of 4,680 square miles, of which 720 square miles (15 percent) lie in Georgia, and 3,960 square miles (85 percent) lie in Alabama. Water resources within the Tallapoosa River basin are affected by runoff from all parts of the basin. This plan focuses on management of water resources within the Georgia portion of the basin only. The plan benefits significantly from the basin coordination being accomplished through the ACT-ACF Comprehensive Study.

The U.S. Geological Survey (USGS) has divided the Tallapoosa basin into three subbasins, or Hydrologic Unit Codes (HUCs; see Table 2-1); however, the entire Georgia portion of the watershed is contained within the Upper Tallapoosa HUC. Figure 2-2 shows the location of the basin, the HUC boundaries, and the associated counties within Georgia.

Table 2-1. Hydrologic Unit Codes (HUCs) of the Tallapoosa River Basin

03150108	Upper Tallapoosa Basin (Georgia and Alabama)
03150109	Middle Tallapoosa Basin (Alabama)
03150110	Lower Tallapoosa Basin (Alabama)

2.1.2 Climate

The Tallapoosa River basin is characterized by a moist and temperate climate. Mean annual precipitation ranges from 49 to 53 inches per year. Precipitation occurs chiefly as rainfall, and to a lesser extent, as snowfall. Rainfall is fairly evenly distributed throughout the year, but a distinct dry season occurs from mid-summer to late fall. Rainfall is usually greatest in March and least in October. The mean annual temperature is about 61 degrees Fahrenheit (Journey and Atkins, 1996; citing Peck et al., 1992; Schneider et al., 1965; and Carter and Stiles, 1983).

2.1.3 Physiography, Geology, and Soils

The Tallapoosa River basin is entirely located within the Piedmont physiographic province that extends throughout the southeastern United States. Similar to much of the Southeast, the basin's physiography reflects a geologic history of mountain building in the Appalachian Mountains, and long periods of repeated land submergence in the Coastal Plain province. The Piedmont province is characterized by a well-dissected upland with rounded interstream areas to the north. Prominent topographic features generally reflect erosional and weathering resistance of the underlying geologic units. Stream patterns are dominantly dendritic (Journey and Atkins, 1996).

Geology

The geology of the Tallapoosa River basin strongly influences its physiography, geochemistry, soils, surface and ground water resources. This discussion is adapted from Journey and Atkins (1996).

The Tallapoosa River basin in Georgia lies entirely within the Piedmont province, which is characterized by complex sequences of igneous rocks and metamorphic rocks of late Precambrian to Permian age (Miller, 1990). Collectively, these rocks are called crystalline rocks (Figure 2-3). The metamorphic rocks originally were sedimentary, volcanic, and volcaniclastic rocks that have been altered by several stages of regional metamorphism to slate, phyllite, schist, gneiss, quartzite, and marble. The metamorphic

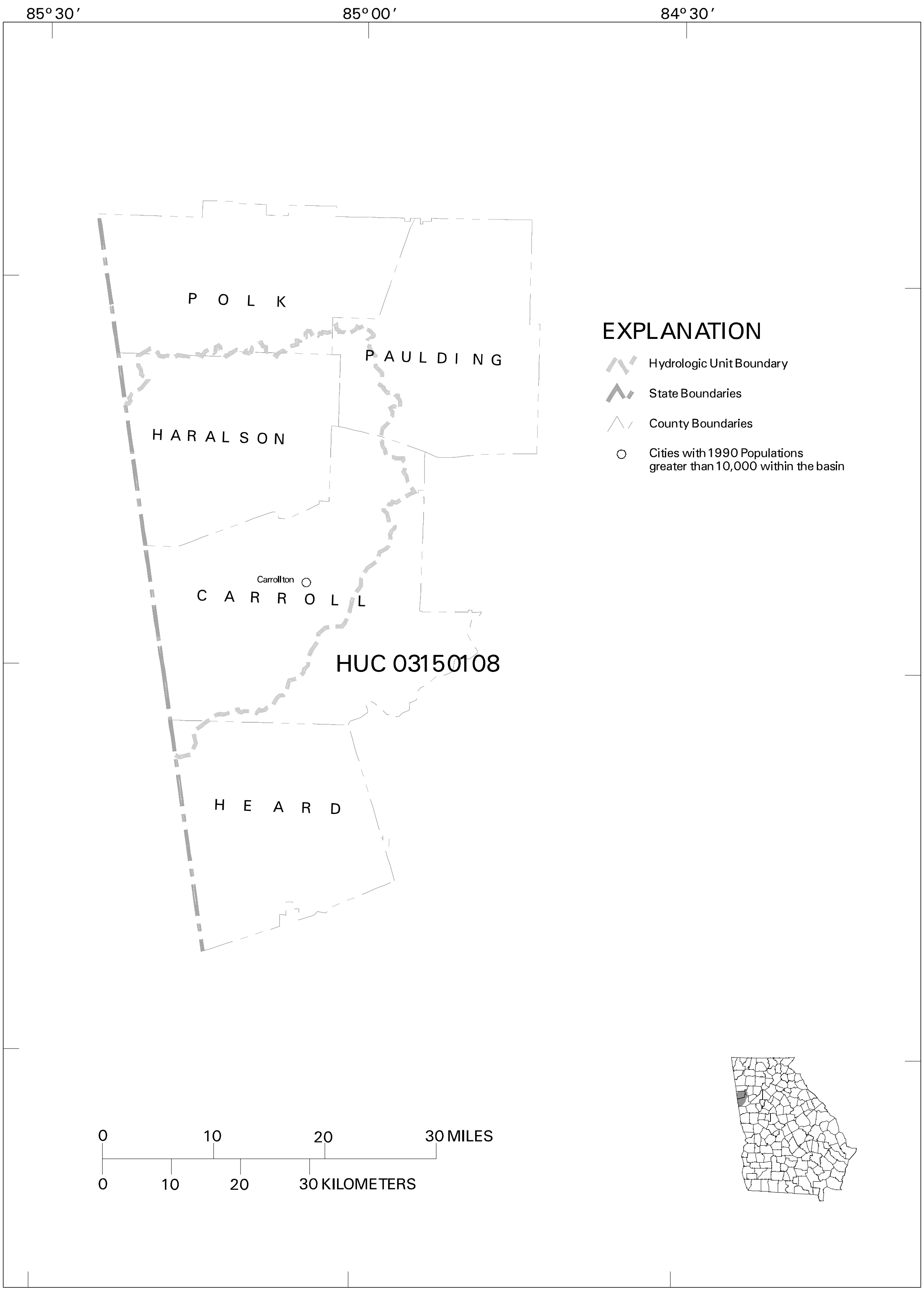

Figure 2-2. Hydrologic Units and Counties of the Tallapoosa River Basin

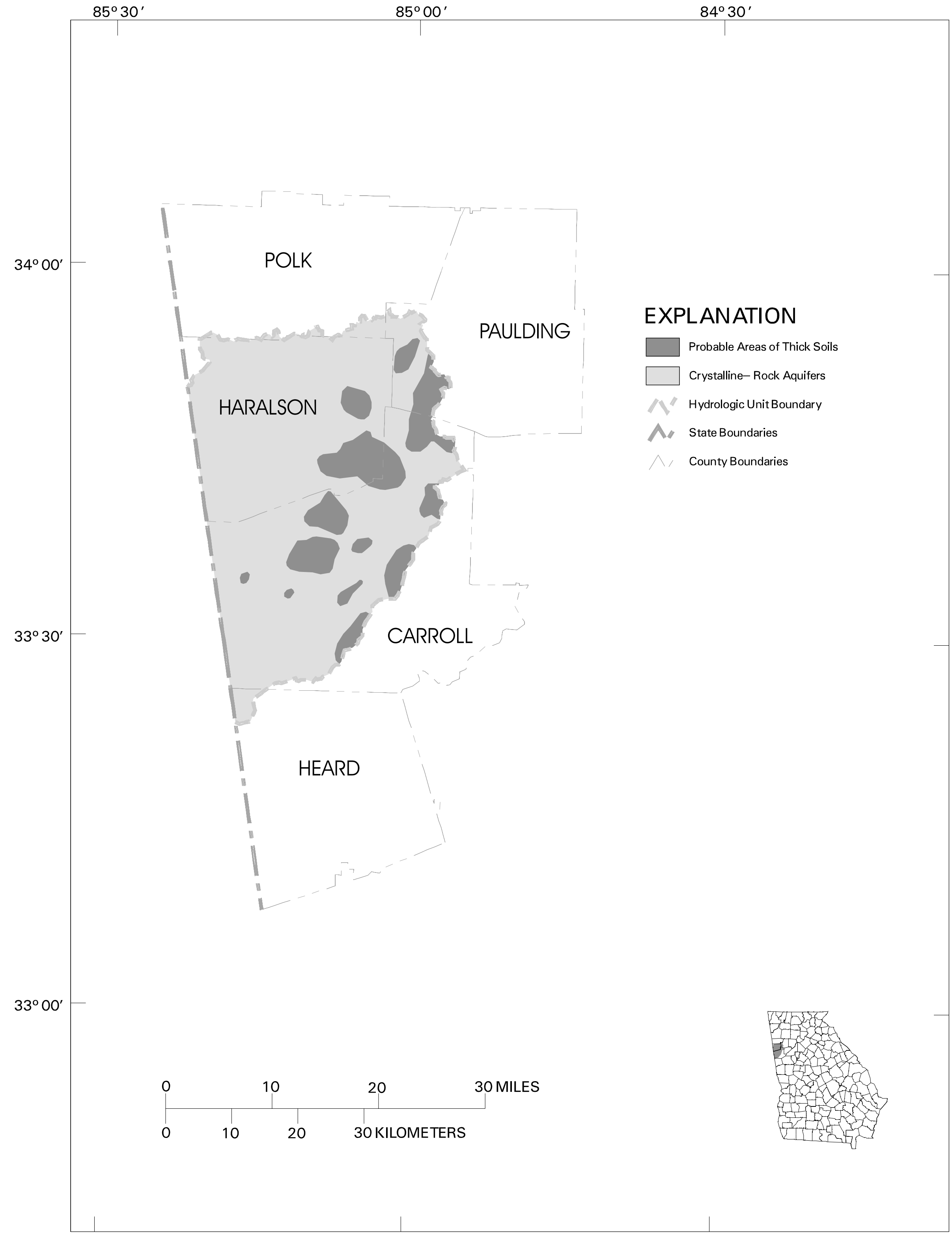

Figure 2-3. Hydrogeologic Units Underlying the Tallapoosa River Basin

rocks are extensively folded and faulted. The intrusive igneous rocks, dominantly granites and lesser amounts of diorite and gabbro, occur as widespread plutons. The rocks are characterized by a complex outcrop and subsurface distribution pattern. Because rock characteristics can vary significantly on the scale of a few tens of feet within the same lithologic unit, detailed geologic-unit differentiation can be accomplished only on the scale of a topographic quadrangle, or larger. The Piedmont contains major fault zones that generally trend northeast-southwest and form the boundaries between the major rock groups.

The crystalline igneous and metamorphic rocks largely are covered by a layer of weathered rock and soil known as regolith. The regolith ranges in thickness from a few to more than 150 feet, depending upon the type of parent rock, topography, and hydrogeologic history. From the land surface, the regolith consists of a porous and permeable soil zone that grades downward into a clay-rich, relatively impermeable zone that overlies and grades into porous and permeable saprolite, generally referred to as a transition zone (Heath, 1989). The transition zone grades downward into unweathered bedrock. In general, the massive granite and gabbro rocks are poorly fractured and are characterized by a thin soil cover. In contrast, the schists and gneisses are moderately to highly fractured. The weathering of the rocks is erratic and usually deep.

Soils

Soils of the Tallapoosa River basin occur almost entirely within the Southern Piedmont major land-resource area (formerly termed a soil province), as shown in Figure 2-4. The soils in the basin developed primarily from gneiss schist, mica schist, and phyllite. The area is characterized by soils that have a gravelly sandy loam surface layer and a yellowish red to red, loamy to clayey subsoil. These soils have a higher content of mica than is typical for the Southern Piedmont; many of the soils have micaceous mineralogy.

The east and southeast portions of the basin have broader ridges and gentler slopes than the northwest portion. Slopes cover a wide range, but most of the area has slopes less than 10 percent. The dominant soils have a deep red clay subsoil. These soils are mostly on the broader ridges. The steeper hillsides in this part of the basin are mostly shallow soils overlying soft bedrock of mica schist and phyllite. These soils have a gravelly fine sandy loam surface layer and a yellowish red loamy subsoil.

The northwest part of the basin has steeper slopes and narrower ridges. Most of the area has slopes greater than 10 percent. The dominant soils have a gravelly fine sandy loam surface layer and a yellowish red loamy subsoil soft bedrock of mica schist and phyllite with bedrock at shallow depths.

2.1.4 Surface Water Resources

The Tallapoosa River rises in northwest Georgia, 40 miles west of Atlanta, at an elevation of about 1,145 feet above mean sea level. It flows in a south-westerly direction for about 195 miles into Alabama and then westerly for 40 miles to join the Coosa River near Wetumpka. Within Georgia, the Tallapoosa River and the Little Tallapoosa River form separate basins of almost equal drainage area. The basin drains a total area of 4,680 square miles, of which 720 square miles are in Georgia and 3,960 square miles are in Alabama. The river, with widths varying from 250 feet to 700 feet, has banks that are 20 feet high along the flood plain. From its source, the river drops at a rate of about 12 feet per mile for 15 miles to elevation 960, a few miles upstream from U.S. Highway 27. It then descends at a more gradual rate of 3.4 feet per mile until it reaches elevation 490 at mile 83, near U.S. Highway 280.

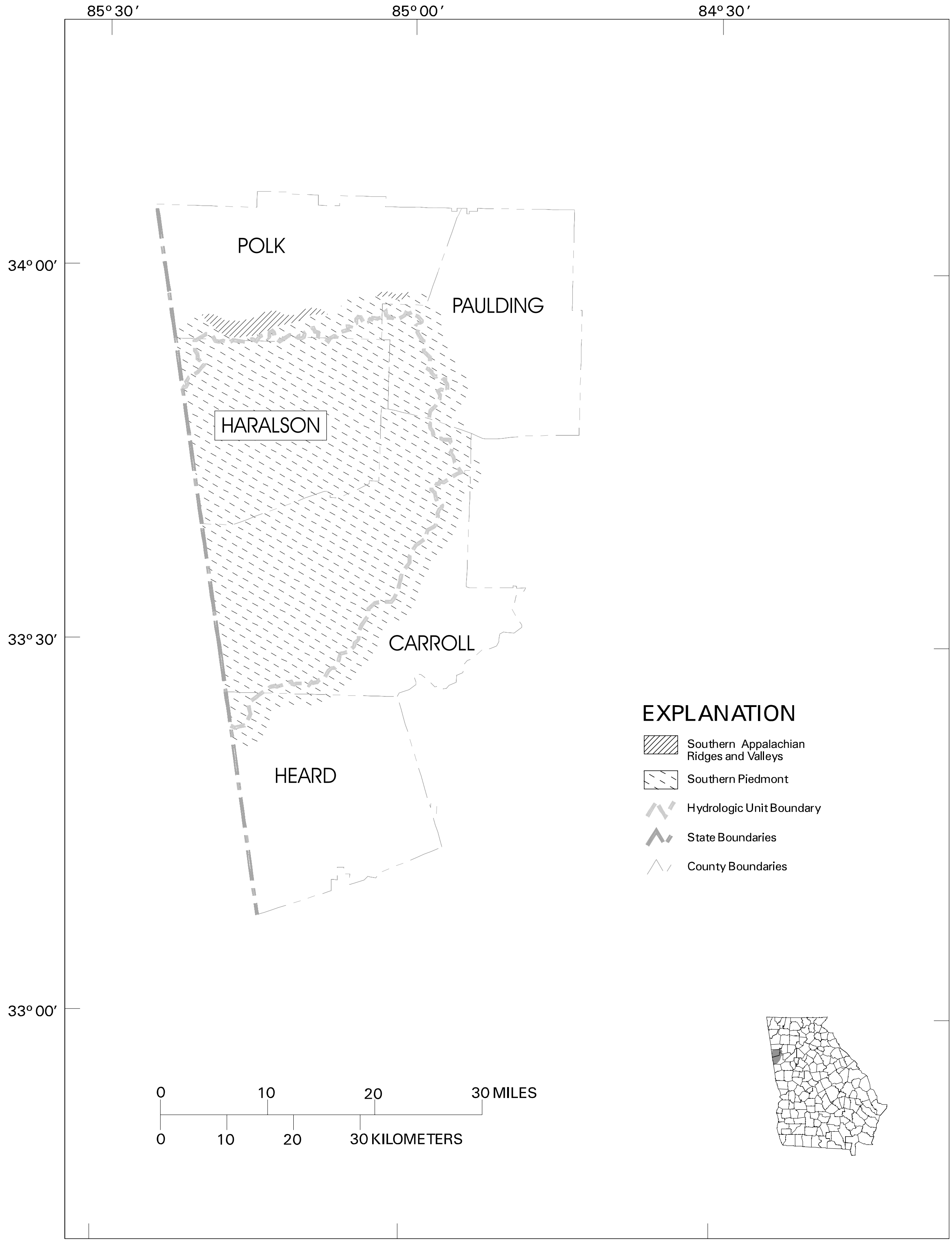

Figure 2-4. Major Land Resource Areas in the Tallapoosa River Basin

Bankfull capacity is approximately 2,500 cubic feet per second in the upper reaches of the river near Heflin, Alabama. At Wadley, Alabama, the bankfull capacity is approximately 22,000 cubic feet per second and it is approximately 60,000 cubic feet per second at Tallassee, Alabama, just below Thurlow Dam. The principal tributary streams are the Little Tallapoosa River, which has a drainage area of 605 square miles in Georgia and Alabama, and Sougahatchee, South Sandy, Uphapee, and Hillabee Creeks in Alabama. The confluence of the Coosa and Tallapoosa Rivers form the Alabama River near Wetumpka, Alabama, and the Alabama and Tombigbee Rivers merge to form the Mobile River near Calvert, Alabama.

Flow Rates of the Tallapoosa River

No continuous record stream gaging stations exist at the Georgia-Alabama border; however Journey and Atkins (1996) estimate that the estimated mean annual stream discharge from Georgia into Alabama is between about 420 and 690 cubic feet per second for the Tallapoosa River and between about 370 and 600 cubic feet per second for the Little Tallapoosa River.

The continuous-record station closest to the Georgia-Alabama State line on the Tallapoosa River is the gage on the Tallapoosa River near Heflin, Alabama (USGS station 02412000), with a mean annual discharge of 689 cubic feet per second over the period of record. Figure 2-5 displays trends in discharge at this station for 1975–1996 as boxplots. Each entry on the plot summarizes daily average flow measurements for a water year. The water year is defined as running from October of the previous calendar year through September of the current year. The center horizontal line marks the median flow for the year, which is the 50^{th} percentile or flow that is exceeded on half of the days in the year. The upper and lower edges of the box represent the 75^{th} and 25^{th} percentiles, respectively. The lines or “whiskers” extending from each box show the range of data, except that high values far above the median are shown as asterisks or circles. Median yearly flows show significant variability, ranging from 169 cfs in 1988 to 747.5 cubic feet per second in 1984 over the last 20 years. The maximum daily average flow observed between 1975 and 1996 was 30,200 cubic feet per second on March 31, 1977, while the minimum was 21 cubic feet per second on October 12–14, 1993. Measures of instantaneous peak flows at this station are available since 1953, with maximum peak flow reported of 32,500 cubic feet per second on 31 March, 1977.

Stream networks within the Georgia portions of the Tallapoosa basin are shown in Figure 2-6.

Reservoirs and Dams

The Alabama Power Company has constructed four dams across the Tallapoosa River. The most upstream project is Harris Dam, located about 15 miles upstream from Wadley, Alabama. Martin, Yates, and Thurlow Dams form continuous impoundments for about 33 miles, across the fall line, upstream from Tallassee, Alabama. The most upstream project is Harris Dam, located about 15 miles upstream from Wadley, Alabama.

The Tallapoosa basin contains no major dams and associated impoundments within Georgia at this time, although the Harris impoundment in Alabama extends into Georgia (Table 2-2). R.L. Harris Dam is located on the Tallapoosa River at river mile 139.1 in Randolph County, Alabama. Construction was completed in April 1983. It is a storage project with normal operating head of 124 feet and a drainage area of 1,453 square miles. The reservoir formed by this dam impounds approximately 424,969 acre-feet at top of summer power pool, of which 207,320 acre-feet is available for power storage. The lake at elevation 793 feet covers 10,661 acres with 271 miles of shoreline.

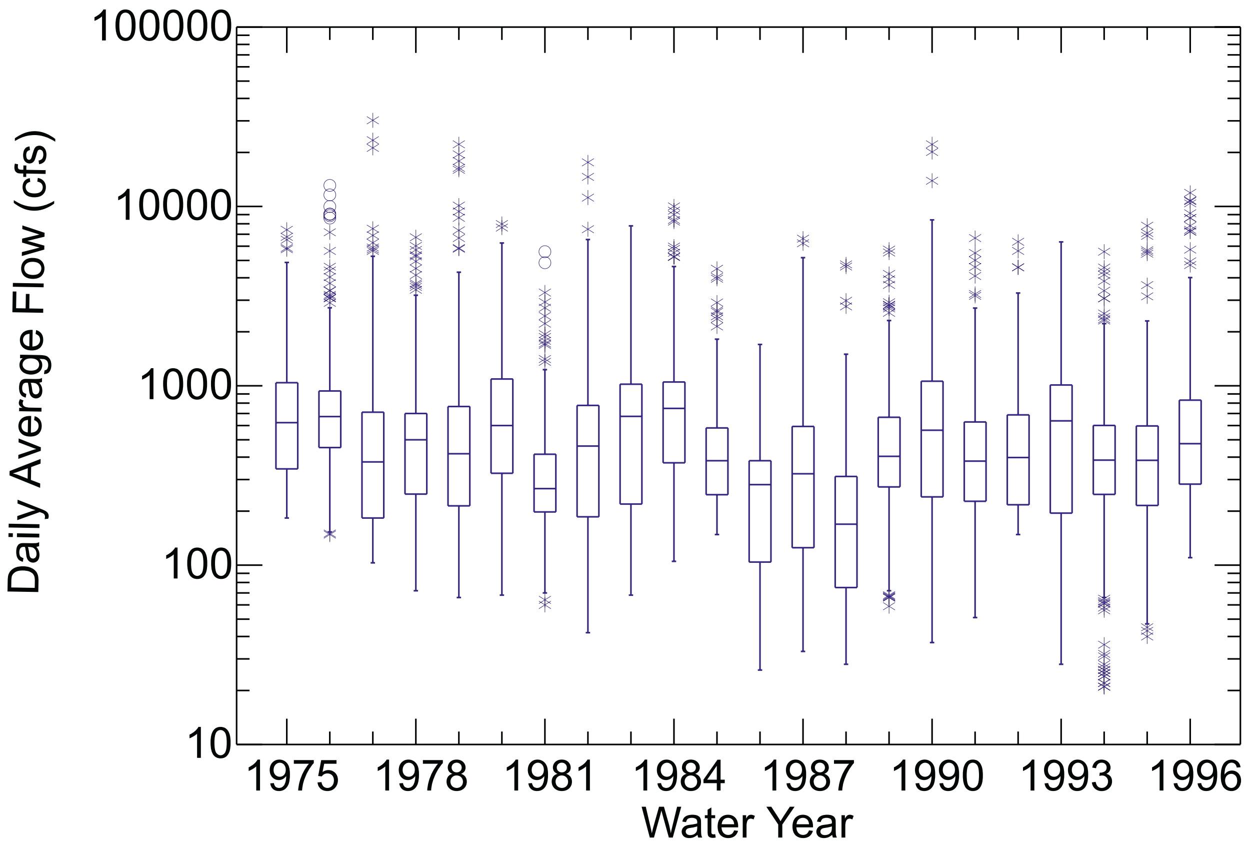

Figure 2-5. Mean Daily Discharge for the Tallapoosa River near Heflin, Alabama (USGS Station 02412000)

Figure 2-6. Hydrography, Tallapoosa River Basin, HUC 03150108

Table 2-2. Major Dams and Impoundments in the Tallapoosa River Basin

Project Name	Drainage Area (Sq. mi.)	Reservoir Size (ac)	Reservoir Storage Volume (ac-ft)	Total Power Capacity (kW)	Normal Lake Elevation (ft)
Harris Dam and Lake	1,453	10,661	425,503	135,000	793
Martin Dam and Lake	3,000	40,000	1,623,000	154,000	490
Yates Dam and Lake	3,300	2,000	53,770	37,000	344
Thurlow Dam and Lake	3,325	574	18,461	58,000	289

2.1.5 Ground Water Resources

The geology of the Tallapoosa River basin determines the ground-water characteristics of the area. Two major types of aquifers underlie the Tallapoosa River basin. These are identified on the basis of their ability to store and yield water as: (1) porous-media, and (2) fracture-conduit aquifers (Journey and Atkins, 1996).

Porous-media Aquifers

Porous-media aquifers typically consist of unconsolidated or poorly consolidated sediments. In these aquifers, ground water moves through interconnected pore spaces between sediment grains. The porous-media aquifers occur in the regolith (soil, alluvium, and saprolite derived from various aged rocks), and are generally suitable for domestic use only.

Fracture-conduit Aquifers

Fracture-conduit aquifers occur in igneous and metamorphic rocks of the Piedmont province. Fracture-conduit aquifers underly the shallower regolith. Within the fracture-conduit aquifers nearly all ground-water movement is through fractured or broken rock and through openings between cleavage plains. Because flow is determined by fracture patterns, these aquifers have distinct local, discontinuous properties. Well yields are variable: 1 to 25 gallons per minute is typical, but yields may exceed 500 gallons per minute. Water quality is generally good.

Within the Piedmont province, ground-water storage is primarily in the overlying weathered rock (regolith or saprolite), while the fracture-conduit aquifer generally has a low storage capacity. The volume of water in storage is controlled by the porosity and thickness of the regolith, which is thicker in marble, schist, gneiss, and in valleys; to a lesser degree, the volume of water in storage is controlled by the amount of fracturing of the rock. Because of the limited storage in fractures, water levels in fracture-conduit aquifers respond rapidly to pumping and to seasonal changes in rainfall (Journey and Atkins, 1996). Annual low water levels generally occur in the fall after the dry summer, and annual high water levels occur in the early spring because of recharge following rainfall during the winter.

Ground Water/Surface Water Interactions

Streamflow is composed of two major components: overland or surface runoff, and baseflow, representing ground water discharge to the stream. Within the Tallapoosa basin, the unit-area mean-annual baseflow due to ground water discharge is estimated to be 0.902 cubic feet per second per square mile. Journey and Atkins (1996) estimate that the mean annual contribution of baseflow to flow in the Tallapoosa River and Little Tallapoosa River at the Georgia-Alabama state line is approximately 534 cubic feet per second, or about 51 percent of the total annual flow.

2.1.6 Biological Resources

The Tallapoosa River basin supports a diverse and rich mix of terrestrial and aquatic habitats and is home to a number of federally and state-protected species. Some of the most important biological resources of the basin are summarized below.

Terrestrial Habitats

The health of aquatic ecosystems is linked to the health of terrestrial ecosystems. All parts of the Tallapoosa River basin have been subjected to varying degrees of forest-cover alteration. Small-scale disturbance of native forests began with American Indians who used fire to create fields for cultivation. Forest disturbance was greatly accelerated by European settlers who logged throughout the basin and extensively cleared land for agriculture.

Prior to European settlement, the Tallapoosa River basin was mostly forested. Native forests in the Piedmont Province were dominantly deciduous hardwoods and mixed stands of pine and hardwoods. The Upper Piedmont region comprises the hilly upland portion of the Piedmont. Streams in this region drain primarily into the Etowah, Tallapoosa, Tugaloo, and upper Chattahoochee rivers. Valleys of this region are intermediate in breadth between the Blue Ridge and the lower Piedmont. Flooding occurs less frequently here than in the lower Piedmont, in part because the headwaters of these streams lie in the mountains, with deep humus soils and abundant vegetation. Soil parent materials are metamorphic rocks of Paleozoic or Precambrian age. Surface soils vary in composition, but subsoils of sandy clay or clay loam are typical. Floodplains are generally narrower and steeper than in the lower Piedmont, and valley forests contain a greater number of northern biotic elements, such as *Quercus rubra, Q. alba, Juglans nigra, Asimina triloba, Magnolia tripetala,* and *Lindera benzoin.*

Wetland Habitats

Wetlands are lands transitional between terrestrial and deep-water habitats where the water table is at or near land surface or the land is covered by shallow water (Cowardin et al., 1979). Most wetlands in the Tallapoosa River basin are forested wetlands located in floodplains of streams and rivers. Forested floodplain wetlands are maintained by the natural flooding regime of rivers and streams, and in turn, influence the water and habitat quality of riverine ecosystems.

Assessments of wetland resources in Georgia have been carried out with varying degrees of success by the Natural Resources Conservation Service (Soil Conservation Service-USDA), the US Fish and Wildlife Service National Wetland Inventory, and Georgia's Department of Natural Resources.

Georgia DNR compiled a wetland mapping database in 1991 which is based on classification of Landsat Thematic Mapper (TM) satellite imagery taken during 1988-1990. Total wetland acreage based on landsat TM imagery is 4761.3 acres or 1.1 percent of land area in the Tallapoosa River basin. These data underestimate the acreage of forested wetlands, where considerable acreage may have been classified as hardwood or mixed forest.

Aquatic Fauna

This section focuses on aquatic or wetland species including fish, amphibians, and aquatic reptiles. However, the Tallapoosa River basin is rich in many other fauna that rely on the water resources of the basin, including many species of breeding birds and mammals. Although a description of these bird and mammal species is beyond the scope of this report, the water needs of these species, such as bald eagles, fish-eating mammals, and migratory water fowl, should be considered in water-resource planning and management.

Fish Fauna

The Tallapoosa River basin supports cold and warm water fisheries. Species important to recreational anglers include largemouth, spotted, and redeye bass; rainbow trout; black crappie; channel catfish; and various species of sunfish. The river is free flowing in Georgia with no major impoundments until it reaches Harris Reservoir in Alabama. However, the West Georgia Reservoir has been proposed for the Georgia portion of the basin, and would significantly alter fish habitat.

Several studies of fish in the Tallapoosa basin have been conducted in conjunction with planning for the proposed West Georgia Reservoir. Beisser (1990) developed an inventory of fish species in the vicinity of the proposed reservoir and identified 72 species inhabiting the drainage based on museum collections and literature citations, of which 46 were confirmed by electrofishing in 1989–1990. Of these, five species are endemic to the Tallapoosa basin and three are rare or exhibit unique distribution patterns in Georgia.

The largest group of species are in the minnow family Cyprinidae. Minnows are small fish that can be seen darting around in streams that are only a few feet wide. Other families with large numbers of species are the sunfish and bass family, the catfish family, and the sucker family. Species that have the largest numbers of individuals living in streams typically are minnows and suckers. These species are often not well known because, unlike sunfish, bass, and catfish, people do not fish for them, although certain minnows may be used as bait. Minnows have an important role in the aquatic food chain as prey for larger fish, snakes, turtles and wading birds such as herons. Suckers can grow to more than one foot long and are named for their down-turned mouth that they use to “vacuum” food from stream bottoms. Although suckers are not popular game fish, they are ecologically important because they often account for the largest fish biomass in streams.

The standing crop of fish in the Tallapoosa River ranged from 57 to 94 kg/ha in spring and summer rotenone samples collected in 1966 (Georgia Game and Fish, 1966; cited in Beisser, 1990). Non-predatory game fish (sunfish) were dominant by weight in the spring sample, while non-predatory food fish (suckers) were dominant in the fall sample.

The Tallapoosa River basin has a number of designated secondary trout waters. Georgia Game and Fish has regularly stocked rainbow trout in Beach Creek, Flatwood Creek, Lassetter Creek, and the mainstem Tallapoosa River. In addition, brook trout have occasionally been stocked in Beach Creek and the mainstem, as well as brown trout and smallmouth bass in the mainstem.

Six fish species occurring within the Tallapoosa River basin have been listed for protection by the State as endangered, threatened, or rare; however, none of these species have been listed at the Federal level (Table 2-3).

Amphibians and Reptiles

The Tallapoosa River basin of Georgia has received relatively little reptile and amphibian collecting attention in the past. As a result, only twelve amphibians (five

Table 2-3. Federal and State Protected Aquatic and Wetland Species in the Georgia Portion of the Tallapoosa River Basin

Common Name	Species	Federal Status	State Status	Ranking
Vertebrate Animals				
Tallapoosa Shiner	*Cyprinella gibbsi*		R	Apparently secure globally; rare or uncommon in state.
Lipstick Darter	*Etheostoma chuckwachattee*		E	Critically imperiled in state because of rarity; global status uncertain.
Tallapoosa Darter	*Etheostoma tallapoosae*		R	Rare or uncommon in state; rare or apparently secure globally.
Stippled Studfish	*Fundulus bifax*		E	Critically imperiled in state because of rarity; globally imperiled or rare.
Pretty Shiner	*Lythrurus bellus*		T	Imperiled in state because of rarity; demonstrably secure globally.
Black Madtom	*Noturus funebris*		R	Imperiled or critically imperiled in state; demonstrably secure globally.
Plants				
Harper Heartleaf	*Hexastylis shuttleworthii var. harperi*		U	Subspecies may be imperiled in state; globally apparently secure.
Monkeyface Orchid	*Platanthera integrilabia*		T	Imperiled or critically imperiled in state; imperiled globally because of rarity.

E: Endangered T: Threatened R: Rare L: Listed P: Proposed U: Unusual salamanders and seven frogs) requiring freshwater for all or part of their life cycle have been documented from this drainage in the state (Williamson and Moulis, 1994). Two additional salamanders that omit an aquatic life-stage, the slimy salamander (*Plethodon glutinosus*) and seepage salamander (*Desmognathus aeneus*), are nevertheless strongly associated with riparian zones of the Georgia Tallapoosa River basin and others. Currently, seventeen undocumented amphibians are quite likely to inhabit this region either due to their occurrence in the adjacent Alabama portions of the Tallapoosa drainage (Mount, 1975) or because they have been reported from Georgia portions of the drainage by participants of the Georgia Herp Atlas Project. Of these 31 amphibian species, six (seepage salamander: *Desmognathus aeneus,* four-toed salamander: *Hemidactylium scutatum,* Alabama waterdog: *Necturus alabamensis,* Webster's salamander: *Plethodon websteri,* mud salamander: *Pseudotriton montanus,* and wood frog: *Rana sylvatica*) are considered of "Special Concern" by the Georgia Natural Heritage Program. No state or federally listed/protected amphibians are likely to occur in this region.

Only two turtle and three snake species comprise the documented reptiles strongly associated with freshwater habitats of the Tallapoosa River basin (Williamson and Moulis, 1994). Six additional turtle species and one additional snake are quite likely to inhabit this region due to their occurrence in the adjacent Alabama portions of the Tallapoosa drainage (Mount, 1975). No state or federally listed/protected reptiles are likely to occur in this region.

Aquatic Macroinvertebrate Fauna

Freshwater mussels provide natural filtration systems that help keep water clean and clear. The southeastern United States is the global epicenter of freshwater molluscan diversity (Burch 1973) and the status of riverine freshwater mussels may be one of the most critical conservation problems in the region (Williams *et al.* 1992; Neves *et al.* 1997). Nearly three-fourths of the southeastern freshwater mussel fauna is federally listed or has candidate species status (Williams *et al.* 1992). At least 21 southeastern mussel species have gone extinct in relatively recent times (Neves *et al.* 1997). Tennessee and Alabama historically contain the most diverse mussel fauna but Georgia, with 98 species in the family Unionidae, has the fourth most diverse mussel fauna of the 50 states (Neves *et al.* 1997). Not much information is available about the mussel fauna of the Tallapoosa basin, but it is likely that the historical species assembly was quite diverse. One species that is listed (federal and state lists) as threatened, the fine-lined pocketbook, has recently been collected in the Tallapoosa River drainage in Alabama (protected species inventory from the ACT-ACF Comprehensive Study).

Several factors have contributed to the decline of freshwater mussels, including their own complicated life-history strategy and the many impacts on riverine habitat. Mussels have parasitic larval stages that generally require specific fish hosts (Watters 1994). Thus, mussel populations can be impacted either directly through habitat degradation or indirectly through impacts on species of fish that serve as hosts. Modification of river channels for shipping, sedimentation from improper land use or inadequate erosion control, and non-point source pollution are the factors most responsible for mussel population declines (Williams *et al.* 1992; Neves *et al.* 1997).

Hobbs (1981) lists six crayfish species, representing two genera, that occur in the Tallapoosa basin. These species fit into the two ecological groups described by Hobbs as stream dwellers and burrowers.

Aquatic and Wetland Vegetation

While the Tallapoosa River basin supports a diverse population of upland plants, wetland areas are limited, while lakes and ponds occur only as a result of man's activities. The

Georgia Natural Heritage Program has identified two "Special Concern" plant species occurring in the Tallapoosa River basin, including species designated as unusual, rare, threatened, or endangered. Among these, there are two wetland species with state threatened or uncommon status (Table 2-3).

2.2 Population and Land Use

2.2.1 Population

As of 1995, about 98,800 people lived in the Georgia portion of the watershed, primarily along the Interstate 20 and US 27 corridors (DRI/McGraw-Hill, 1996). Population centers in the Tallapoosa watershed include Bremen, Villa Rica, and Carrollton. Population distribution in the basin at the time of the 1990 Census by Census blocks is shown in Figure 2-7.

Between 1985 and 1995, the population in the Georgia portion of the Tallapoosa River basin increased by about 1.7 percent per year (DRI/McGraw-Hill, 1996). Basin population is projected to increase at a slower rate of 0.9 percent per year through 2050.

2.2.2 Employment

The Georgia portion of the Tallapoosa River basin supported 36,700 jobs in 1990, dominated by a variety of manufacturing interests. Of the subbasin's 14,000 manufacturing jobs during 1990, more than 40 percent were classified within the durable goods sector. In coming years, large productivity gains are expected to decrease industrial employment at the same time production increases. Between 1990 and 2050, total nonfarm employment is predicted to increase at an annual rate of 0.4 percent in this basin (DRI/McGraw-Hill, 1996).

2.2.3 Land Cover and Use

Land use/land cover classification was determined for the Tallapoosa River basin based on high-altitude aerial photography for 1972-1976 interpreted by the U.S. Geological Survey. In 1991 land cover data were developed based on interpretation of Landsat TM satellite image data obtained during 1988-1990, leaf-off conditions. These two coverages differ significantly. Aerial photography allows identification of both land cover and land uses. Satellite imagery, however, detects primarily land cover, and not land use, such that a forest and a wooded subdivision may, for instance, appear similar. Satellite interpretation also tends to be less accurate than aerial photography.

The 1972-1976 land use classification (Figure 2-8) indicated that 67 percent of the basin land areas was forest, 28 percent was agriculture, and 4 percent was urban land use, with 1 percent in other land uses, including less than 0.3 percent wetlands.

The 1988-1990 land cover interpretation showed 69.8 percent of the basin in forest cover, 1.1 percent in wetlands, 4.1 percent in urban land cover, and 21.9 percent in agriculture, predominantly pasture (Figure 2-9). Statistics for 15 landcover classes in the Georgia portion of the Tallapoosa basin for the 1988-1990 coverage are presented in Table 2-4 (GA DNR, 1996).

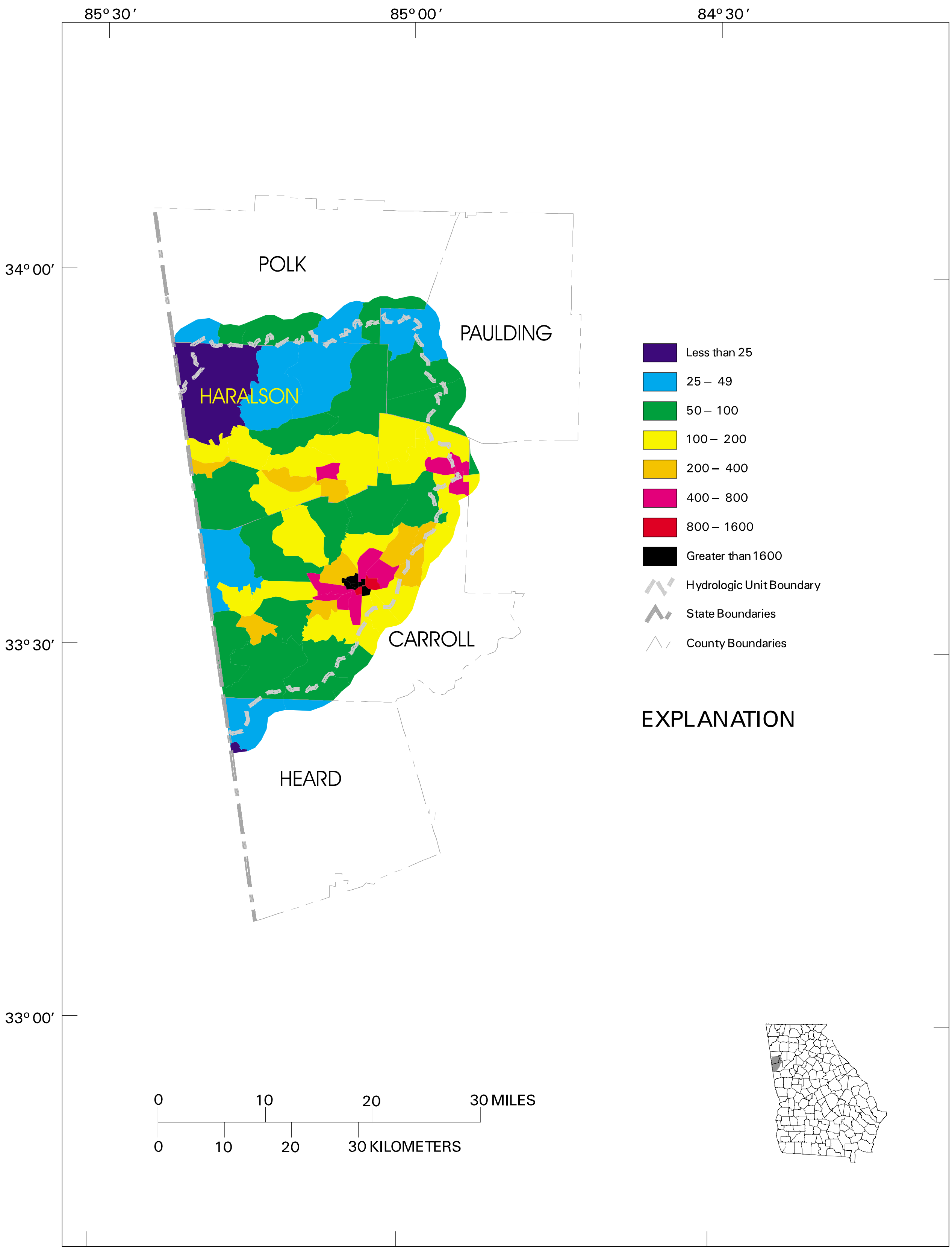

Figure 2-7. Population Density in the Tallapoosa River Basin, 1990

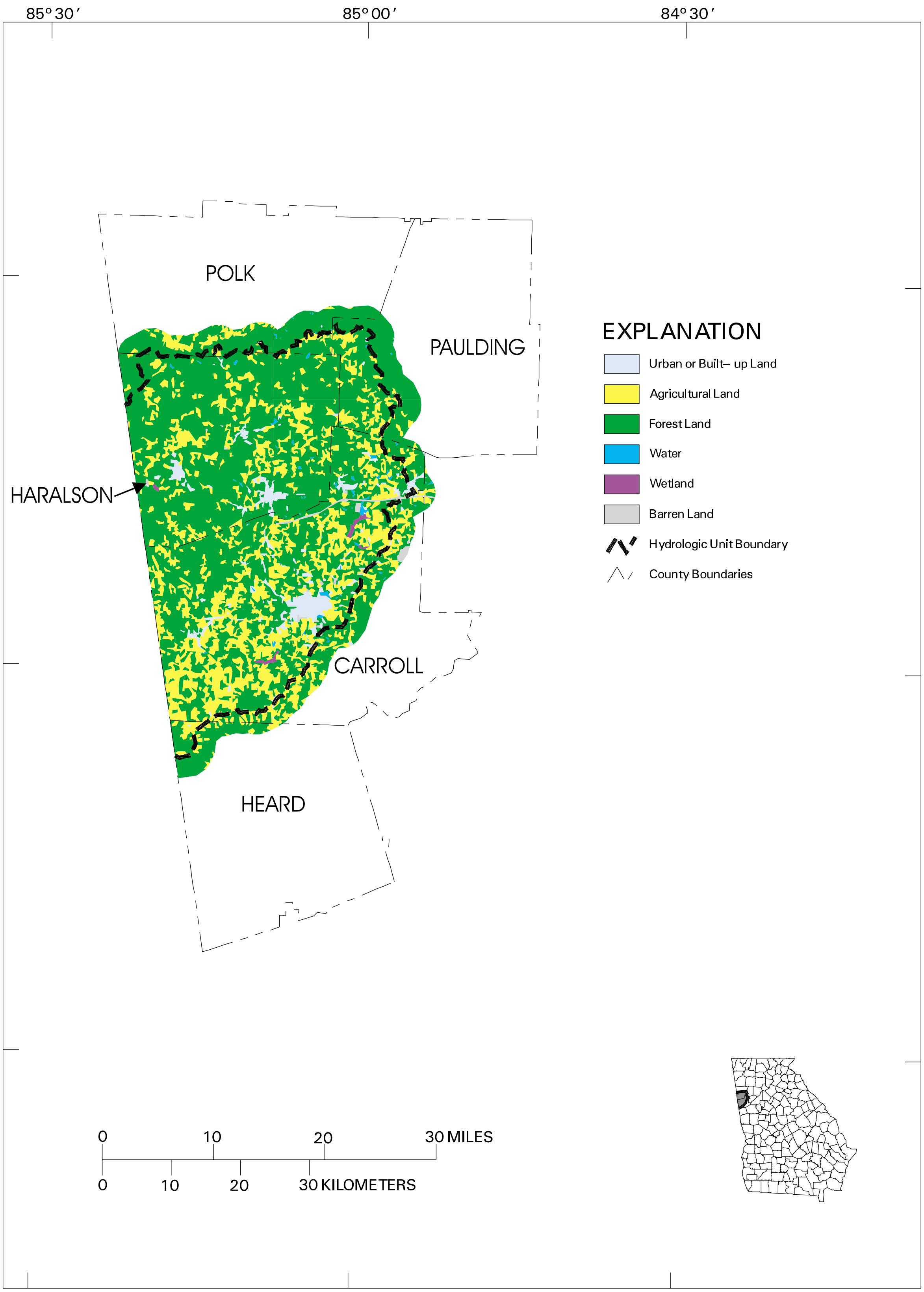

Figure 2-8. Land Use, Tallapoosa River Basin, HUC 03150108, USGS 1972-76 Classification Updated with 1990 Urban Areas

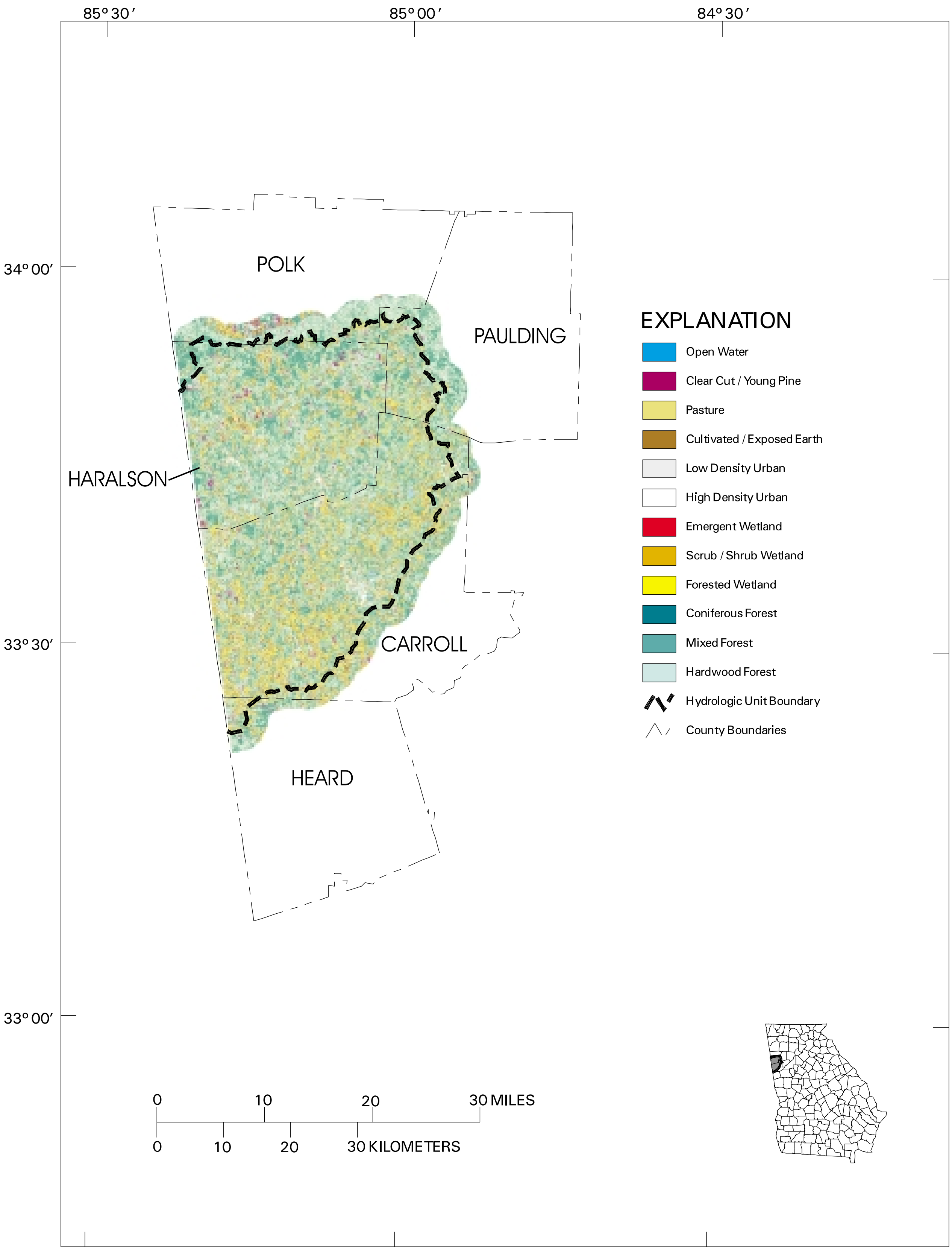

Figure 2-9. Land Cover 1990, Tallapoosa River Basin, HUC 03150108

Table 2-4. Land Cover Statistics for the Tallapoosa River Basin, 1988–1990

Class Name	%	Acres
Open Water	0.9	3,676.8
Clear Cut/Young Pine	1.9	8,031.3
Pasture	15.0	62,163.7
Cultivated/Exposed Earth	6.9	28,509.8
Low Density Urban	3.2	13,334.3
High Density Urban	0.9	3,592.3
Emergent Wetland	0.1	336.1
Scrub/Shrub Wetland	0.1	281.9
Forested Wetland	1.0	4,143.3
Coniferous Forest	16.4	68,202.3
Mixed Forest	30.6	126,777.4
Hardwood Forest	22.8	94,719.4
Salt Marsh	0.0	0.0
Brackish Marsh	0.0	0.0
Tidal Flats/Beaches	0.0	0.0
Total	*100.0*	*414,892.4*

Forestry

Forestry is a major part of the economy within the basin. Markets for forest products afford landowners excellent investment opportunities to manage and sell their timber, pine straw, naval stores, and other products. Statewide, the forest industry output for 1997 was approximately $19.5 billion. The value added by this production, which includes wages, profits, interest, rent, depreciation, and taxes paid into the economy reached a record high $9.3 billion. Georgians benefit directly from 177,000 job opportunities created by the manufacture of paper, lumber, furniture, and various other wood products; consumers of these products also benefit. Other benefits from the forest include hunting, fishing, aesthetics, wildlife watching, hiking, camping, and other recreational opportunities, as well as important environmental benefits such as clean air and water and wildlife habitat.

According to the 1989 U.S. Forest Service's Forest Statistics for Georgia (Thompson, 1989), commercial forest lands represent about 70 percent of the total land area in the Tallapoosa River basin (Table 2-5). Private landowners account for 83 percent of the ownership, while the forest industry companies account for 16 percent. Governmental

Table 2-5. Forestry Acreage in the Tallapoosa River Basin

County	Commercial Forest	Pine	Oak-pine	Upland Hardwood	Lowland Hardwood
Carroll	114,700	24,200	10,900	69,400	10,200
Haralson	128,400	46,800	30,000	37,300	14,200
Heard *					
Paulding	13,400	6,700	0	6,700	0
Polk	3,700	3,700	0	0	0
Total	260,200	81,400	40,900	113,300	24,500

** No sample points occurred within the small section of Heard County, therefore no analysis was available.*

entities account for less than 1 percent of the forest land. Commercial silvicultural land use is concentrated in the Piedmont, west of Atlanta, primarily in Carroll and Haralson counties. (Table 2-5 and Figure 2-10).

The pine type is composed of 38,600 acres of plantations and 42,800 acres of natural stands.

For the period from 1982 through 1989, there was a statewide trend of loss of forest acreage resulting from both conversion to urban and related uses and clearing for agricultural uses. No trends could be established within the basin solely using the 1982 and 1989 USFS data. However using entire Carroll and Haralson County figures as a representative example, the area classified as commercial forest land decreased 1 percent. The area classified as pine type increased (1 percent). The area classified as oak-pine type increased 3 percent. Upland hardwood acreage decreased 9 percent. Lowland hardwood acres increased 35 percent.

Agriculture

Agriculture in the Tallapoosa River basin is primarily restricted to poultry and livestock operations surrounded by pastures. Total farmland in the Tallapoosa River basin (Figure 2-11) has decreased every agricultural census year from 1974 to 1987 (U.S. Bureau of the Census, 1981 a,b,c; 1981a,b,c). By 1992, the total amount of land in farms in the basin had fallen to 88,060 acres, most of which is in pasture.

Those lands that are in farms; however, support a vibrant infrastructure in the cattle and broiler industry. In fact, Carroll County is the third highest ranking cattle producing county in Georgia with 27,000 head of cattle on farms in 1997 (Georgia Agricultural Facts, 1997 Edition). Carroll County also ranks ninth among Georgia counties in commercial broiler production having sold over 25,000,000 birds in 1992 (Georgia Agricultural Facts, 1997 Edition). There are also a few dairy and swine operations scattered throughout the Basin (Table 2-6).

2.3 Local Governments and Planning Authorities

Many aspects of basin management and water quality protection depend on decisions regarding zoning, land use, and land management practices. These are particularly important for the control of nonpoint pollution—pollution that arises in storm water runoff from agriculture, urban or residential development, and other land uses. The authority and responsibility for planning and control of these factors lies with local governments, making local governments and jurisdictions important partners in basin management.

Table 2-6. Agricultural Operations in the Tallapoosa River Basin, 1992-1995 (data supplied by NRCS)

Element	Total for Basin
Dairy Cows	720
Beef Cows	25,900
Hogs	2,140
Layer Hens (thousands)	0
Broilers (thousands)	31,480
Harvested Cropland (acres)	11,930
Total Land in Farms (acres)	*88,060*

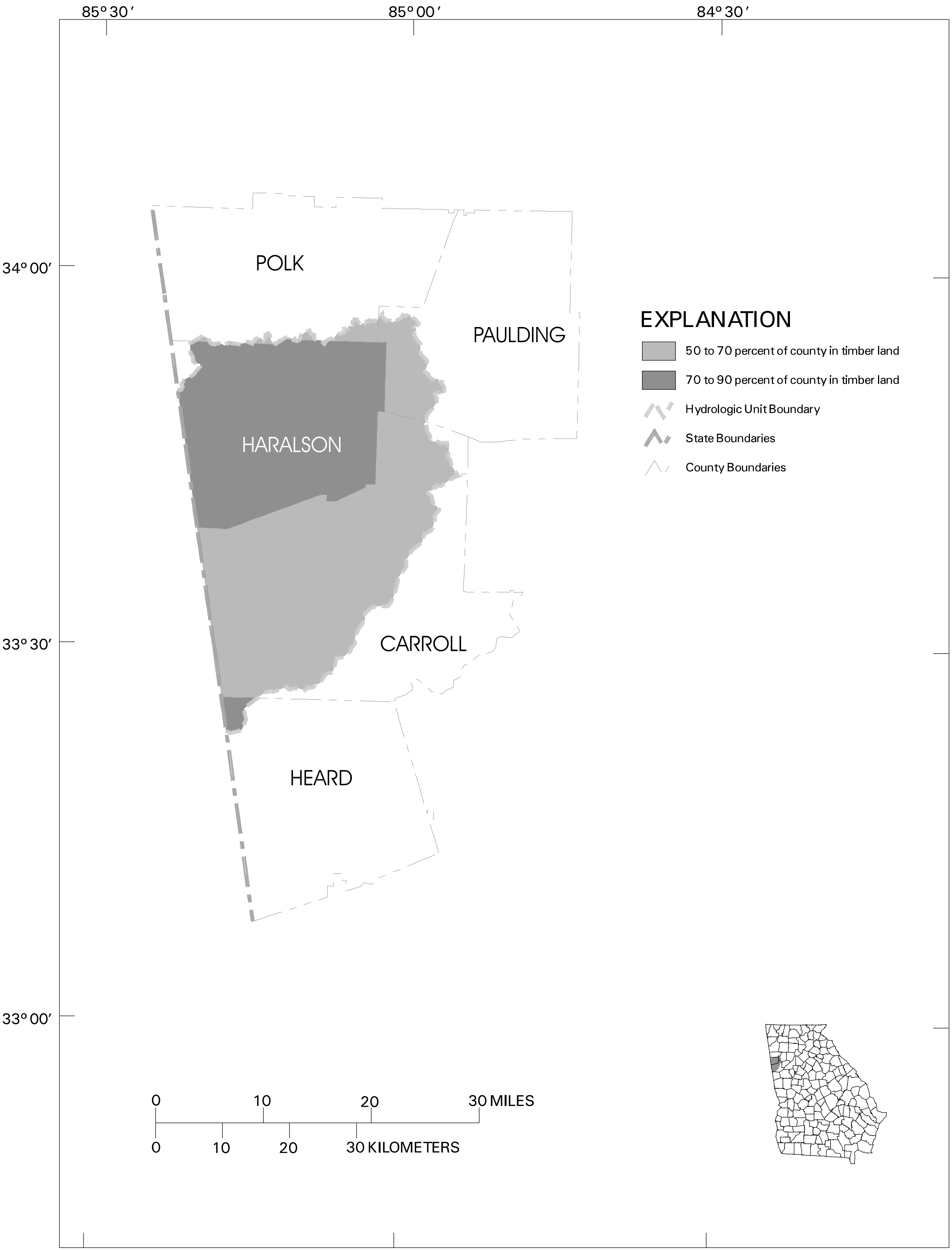

Figure 2-10. Silvicultural Land in the Tallapoosa River Basin

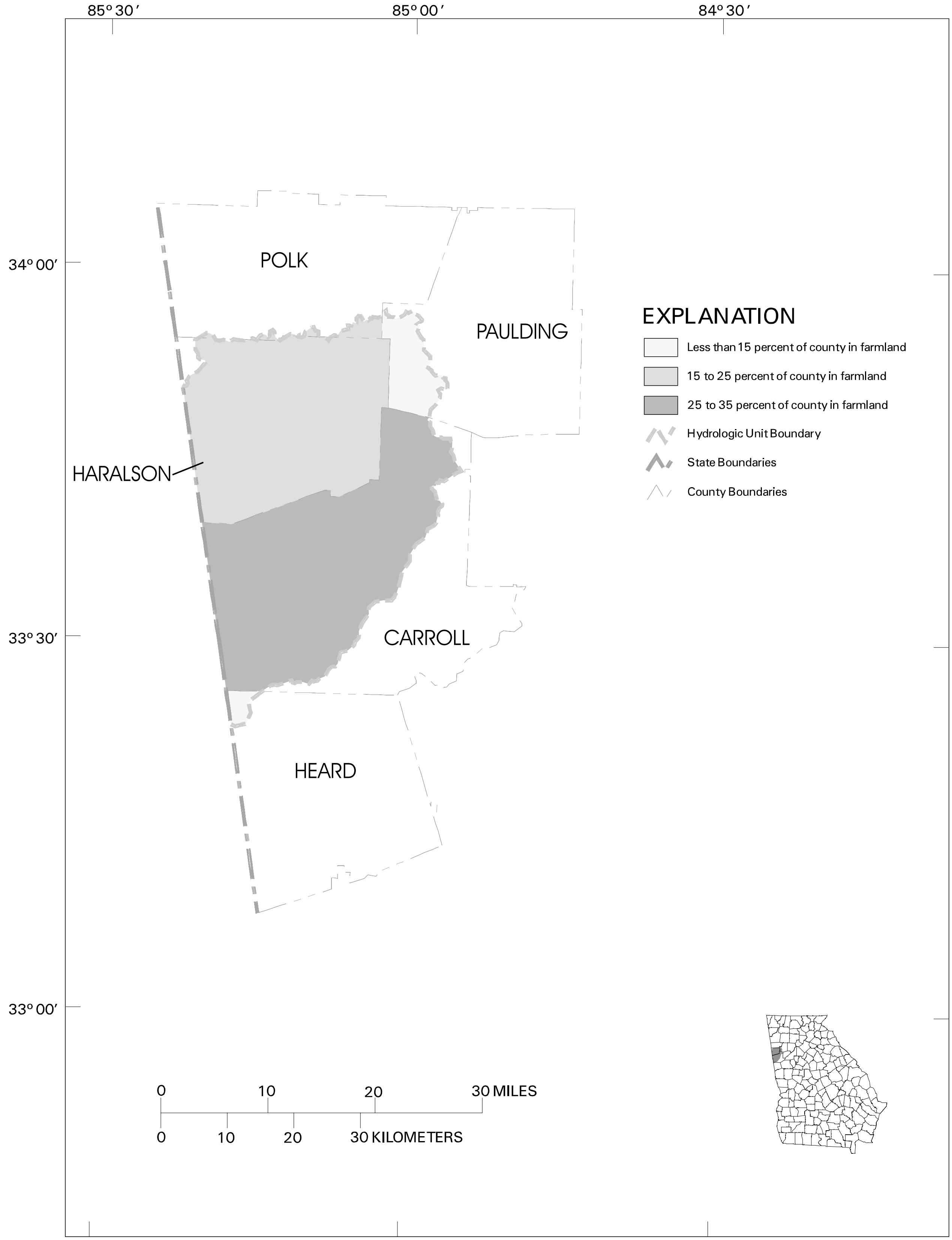

Figure 2-11 . Agricultural Land in the Tallapoosa River Basin

The Department of Community Affairs (DCA) is the state's principal department with responsibilities for implementing the coordinated planning process established by the Georgia Planning Act. Its responsibilities include promulgation of minimum standards for preparation and implementation of plans by local governments, review of local and regional plans, certification of qualified local governments, development of a state plan, and provision of technical assistance to local governments. Activities under the Planning Act are coordinated with the Environmental Protection Division (EPD), Regional Development Centers, and local governments.

2.3.1 Counties and Municipalities

Local governments in Georgia consist of counties and incorporated municipalities. As entities with constitutional responsibility for land management, local governments have a significant role in the management and protection of water quality. The role of local governments includes enacting and enforcing zoning, storm water, and development ordinances; undertaking water supply and wastewater treatment planning; and participating in programs to protect wellheads and significant ground water recharge areas. Many local governments are also responsible for operation of water supply and wastewater treatment facilities.

The Tallapoosa basin includes portions of five Georgia counties (Table 2-7 and Figure 2-2); however, only three counties have a significant fraction of their land area within the basin. Municipalities or cities are communities officially incorporated by the General Assembly. Georgia has more than 530 municipalities. Table 2-8 lists the municipalities in the basin.

2.3.2 Regional Development Centers

Regional Development Centers (RDCs) are agencies of local governments, with memberships consisting of all the cities and counties within each RDC's territorial area. There are currently 17 RDCs in Georgia. RDCs facilitate coordinated and comprehensive planning at local and regional levels, assist their member governments with conformity to minimum standards and procedures, and can have a key role in promoting and supporting management of urban runoff, including watershed management initiatives. RDCs also serve as liaisons with state and federal agencies for local governments in each region. Funding sources include members' dues and funds available through DCA. Table 2-9 summarizes the RDCs and the associated counties within the Tallapoosa basin.

Table 2-7. Georgia Counties in the Tallapoosa River Basin

Counties Entirely within the Tallapoosa Basin	Counties Partially within the Tallapoosa Basin	Counties with Insignificant Area within the Basin
(none)	Carroll, Haralson, Paulding	Heard, Polk

Table 2-8. Georgia Municipalities in the Tallapoosa River Basin

Bowdon	Draketown	Mt. Zion	Victory
Bowdon Junction	Felton	Tallapoosa	Villa Rica
Bremen	Jake	Temple	Waco
Buchanan	Jonesville	Tyus	Yorkville
Carrollton	Kansas	Veal	

Table 2-9. Regional Development Centers in the Tallapoosa River Basin

Regional Development Center	Member Counties with Land Area in the Tallapoosa Basin
Chattahoochee-Flint RDC	Carroll, Heard
Coosa Valley RDC	Haralson, Paulding, Polk

2.4 Water Use Classifications

2.4.1 Georgia's Water Use Classification System

The Board of Natural Resources was authorized through the Rules and Regulations for Water Quality Control promulgated under the Georgia Water Quality Control Act of 1964, as amended, to establish water use classifications and water quality standards for the surfacewaters of the state. The water use classifications and standards were first established by the Georgia Water Quality Control Board in 1966. Georgia was the second state in the nation to have its water use classifications and standards for intrastate waters approved by the federal government in 1967. For each water use classification, water quality standards or criteria were developed that established a framework to be used by the Water Quality Control Board and later EPD in making water use regulatory decisions.

In 1972 the EPD applied the water use classification system to interstate waters. Georgia was again one of the first states to receive federal approval of a statewide system of water use classifications and standards. Table 2-10 provides a summary of water use classifications and criteria for each use.

Congress made changes in the Clean Water Act in 1987 that required each state to adopt numeric limits for toxic substances for the protection of aquatic life and human health. To comply with these requirements, the Board of Natural Resources adopted 31

Table 2-10. Georgia Water Use Classifications and Instream Water Quality Standards for Each Use

	Bacteria (fecal coliform)		Dissolved Oxygen (other than trout streams)[2]		pH	Temperature (other than trout streams)[2]	
Use Classification[1]	30-Day Geometric Mean[3] (no/100 ml)	Maximum (no./100mL)	Daily Average (mg/l)	Minimum (mg/l)	Std. Units	Maximum Rise above Ambient (°F)	Maximum (°F)
Drinking Water requiring treatment	1,000 (Nov-April) 200 (May-October)	4,000 (Nov-April)	5.0	4.0	6.0-8.5	5	90
Recreation	200 (Freshwater) 100 Coastal)	--	5.0	4.0	6.0-8.5	5	90
Fishing Coastal Fishing[4]	1,000 (Nov-April) 200 (May-October)	4,000 (Nov-April)	5.0	4.0	6.0-8.5	5	90
Wild River	No alteration of natural water quality						
Scenic River	No alteration of natural water quality						

[1] *Improvements in water quality since the water use classifications and standards had originally been adopted in 1972 provided the opportunity for Georgia to upgrade all stream classifications and eliminate separate use designations for "Agriculture," "Industrial," "Navigation," and "Urban Stream" in 1993.*

[2] *Standards for Trout Streams, for dissolved oxygen are an average of 6.0 mg/L and a minimum of 5.0 mg/Ll. No temperature alteration is allowed in Primary Trout Streams and a temperature change of 2°F is allowed in Secondary Trout Streams.*

[3] *Geometric means should be "based on at least four samples collected from a given sampling site over a 30-day period at intervals not less than 24 hours." The geometric mean of a series of N terms is the Nth root of their product. Example: The geometric mean of 2 and 18 is the square root of 36.*

[4] *Standards are same as those for fishing with the exception of dissolved oxygen, which has site-specific standards.*

numeric standards for protection of aquatic life and 90 numeric standards for the protection of human health. Appendix B provides a summary of toxic substance standards that apply to all waters in Georgia. Water quality standards are discussed in more detail in Section 5.2.1.

In the late 1960s through the mid-1970s there were many water quality problems in Georgia. Many stream segments were classified for the uses of navigation, industrial, or urban stream. Major improvements in wastewater treatment over the years have allowed the stream segments to be reclassified to the uses of fishing or coastal fishing, which include more stringent water quality standards. The final two segments in Georgia were upgraded as a part of the triennial review of standards completed in 1989. All of Georgia's waters are currently classified as fishing, recreation, drinking water, wild river, scenic river, or coastal fishing.

2.4.2 Water Use Classifications for the Tallapoosa River Basin

Waters in the Tallapoosa River basin are classified as fishing, recreation, or drinking water. Most of the waters are classified as fishing. Those waters explicitly classified in Georgia Regulations are shown in Table 2-11; all other waters in the basin are classified as fishing. A number of waters in the northern portion of the Tallapoosa River basin are also designated as secondary trout streams, as shown in Table 2-12. Secondary trout streams are waters which contain no naturally reproducing trout populations but are capable of sustaining stocked trout throughout the year.

Table 2-11. Tallapoosa River Basin Waters Classified in Georgia Regulations[1]

Waterbody	Description of Segment	Use Classification
Tallapoosa River	Headwaters to Georgia Hwy. 100	Drinking Water
Little Tallapoosa River	Headwaters to SCS Dam No. 36 (Carrollton River Raw Water Intake)	Drinking Water

[1] *Rules and Regulations for Water Quality Control, Chapter 391-3-6 (13). Waters within the Tallapoosa River basin not listed above are classified as Fishing.*

Table 2-12. Tallapoosa River Basin Waters Designated as Trout Streams

County	Classification	Description of Segment
Carroll	Secondary	Brooks Creek watershed
	Secondary	Mud Creek watershed
	Secondary	Tallapoosa River
Haralson	Secondary	Beach Creek watershed upstream from Haralson County Road 34
	Secondary	Flatwood Creek watershed
	Secondary	Lassetter Creek watershed
	Secondary	Mann Creek watershed upstream from Haralson County Road 162
	Secondary	Tallapoosa River watershed upstream from Haralson County Road 222
	Secondary	Mountain Creek watershed
	Secondary	Tallapoosa Creek watershed

References

Beisser, G.S. 1990. The Inventory and Distribution of Fish in the Vicinity of the Proposed West Georgia Regional Reservoir. Interim Report. Federal Aid in Fish Restoration Project F-36. Georgia Department of Natural Resources, Game and Fish Division, Atlanta.

Burch, J.B. 1973. Freshwater Unionacean Clams (Mollusca:Pelycypoda) of North America. Identification Manual Number 11. U.S. Environmental Protection Agency, Washington, DC.

Carter, R.F., and H.R. Stiles. 1983. Average Annual Rainfall and Runoff in Georgia, 1941-1970. Hydrologic Atlas 9, U.S. Geological Survey.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe, 1979. Classification of wetlands and deepwater habitats of the United States: U.S. Fish and Wildlife Service, FWS/OBS-79/31.

DRI/McGraw-Hill. 1996. The Regional Economic Forecast of Population and Employment Comprehensive Study. Prepared for: The ACT/ACF Comprehensive Study, U.S. Army Corps of Engineers, Mobile District. DRI/McGraw-Hill, Lexington, Massachusetts.

GA DNR. 1996. Water Quality in Georgia, 1994-1995. Georgia Department of Natural Resources, Environmental Protection Division, Atlanta, Georgia.

Georgia Game and Fish. 1966. Tallapoosa River Fish Population Studies, June and October 1966 (unpublished).

Heath, R.C. 1989. The Piedmont ground-water system. pp. 1-13 in Daniel, C.C. III, R.K. White, and P.A. Stone, Ground Water in the Piedmont, Proceedings of a Conference on Ground Water in the Piedmont of the Eastern United States. Clemson University, Clemson, South Carolina.

Hobbs, H.H. 1981. The Crayfishes of Georgia. Smithsonian Contributions to Zoology, Number 318.

Journey, C.A., and J.B. Atkins. 1996. Ground-Water Resources of the Tallapoosa River Basin Georgia and Alabama - Subarea 5 of the Apalachicola-Chattahoochee-Flint and Alabama-Coosa-Tallapoosa River Basins. Open-File Report 96-433. U.S. Geological Survey, Montgomery, Alabama.

Means, D.B. 1977. Aspects of the significance to terrestrial vertebrates of the Apalachicola River drainage basin, Florida in Proceedings of the Conference on the Apalachicola Drainage System, Livingston, R.J., and Joyce, E.A., Jr. [eds.]: Florida Marine Resources, no. 26, p. 37-67.

Miller, J.A. 1990. Ground Water Atlas of the United States—Segment 6—Alabama, Florida, Georgia, and South Carolina. Hydrologic Investigations Atlas 730-G. U.S. Geological Survey. 730-G. U.S. Ge.

Mount, R.H. 1975. The Reptiles and Amphibians of Alabama. Agricultural Experiment Station, Auburn University, Alabama. 347 pp.

Neves, R.J., A.E. Bogan, J.D. Williams, S.A. Ahlstedt, and P.W. Hartfield. 1997. Status of aquatic molluscs in the southeastern United States: A downward spiral of diversity. Pages 43-85 in G.W. Benz and D.E. Collins, editors, Southeastern Aquatic Fauna in Peril: The Southeastern Perspective. Special Publication 1, Southeast Aquatic Research Institute. Lenz Design and Communication, Decatur, Georgia.

Peck, M.F., C.N. Joiner, and A.M. Cressler. 1992. Ground-Water Conditions in Georgia, 1991. Open-File Report 92-470. U.S. Geological Survey.

Schneider, W.J., E. Friel, G.C. Meyere, B.M. Wilmoth, H.E. LeGrand, C.R. Collier, G.W. Whetstone, H.C. Barksdale, and J.W. Wark. 1965. Water Resources of the Appalachian Region, Pennsylvania to Alabama. Hydrologic Investigations Atlas HA-198. U.S. Geological Survey.

Watters, G.T. 1994. An annotated bibliography of the reproduction and propagation of the Unionoidea. *Ohio Biological Survey, Miscellaneous Contributions*, 1: 1-158.

Williams, J.D., M.L. Warren, K.S. Cummings, J.L. Harris, and R.J. Neves. 1992. Conservation status of freshwater mussels of the United States and Canada. *Fisheries*, 18(9): 6-22.

Williamson, G.K., and R.A. Moulis. 1994. Distribution of Amphibians and Reptiles in Georgia. Savannah Science Museum, Inc. Savannah, Georgia.