

CHAPTER SIX

NATURAL RESOURCES ELEMENT

This chapter provides an inventory of the natural and historic resources in White County, assesses the natural environmental limitations posed on future development, and establishes a set of goals and objectives designed to protect and preserve the natural and historic resources of the County.

Weather And Climate

The climate of White County is strongly influenced by mountainous terrain. Summers are mild and winters are quite cold. Generous precipitation occurs throughout the year with heavier amounts in winter and early spring.

The complex terrain and contrasting elevations of White County creates highly variable weather conditions. High elevation mountain areas are commonly 5 to 10 degree colder during the day than valley bottoms. In the evening, cold air flows off of the high slopes into the valleys. In these bottom lands, early morning temperatures can be 10 to 15 degrees colder than surrounding areas. Precipitation varies as well. High elevations receive more rainfall and snow than lowlands, as air is forced to rise and cool as it pushed over mountains. Elevation changes alone can increase annual precipitation by 10 inches or more, when compared to nearby lowlands. Microclimates at high elevations are common, and lead to greater biodiversity than surrounding counties that have only low elevations.

The Southeast Regional Climate Center's Clarkesville and Helen stations have weather and climate records from 1961 to 2000. Maximum summer temperatures during this time averaged in the middle to high 80's. July is the warmest month, with the average highs of 86-5 degrees. Lows during the summer are comfortable, and average between the high 50's and low 60's.

Average high temperatures during the winter months are in the low to middle 50's. January is the coldest month with an average high temperature of 50.9, and an average low temperature of 29.4. Average low temperatures throughout the winter months range from the high 20's to the high 30's.

Precipitation in White County follows a winter maximum regime with a second peak of precipitation during summer months. In the Town of Cleveland, December through March are the wettest months, during which time the city receives between 5.71 and 6.94 inches of precipitation per month. July and August also see considerable rainfall. During these months, Cleveland receives a monthly average of 5.64 and 5.37 inches of rain. Snowfall can occur during winter months, especially at higher elevations. Cleveland averages 2.6 inches a year while Helen's average snowfall is 3.4 inches. The fall and early summer are the driest periods. During this time, monthly precipitation averages between 4.24 and 5.19 inches of rain.

Physiography

White County lies within two physiographic provinces: the Blue Ridge District and the Piedmont District. The north and northwest sections of the County are within the Blue Ridge Mountains District, which consists of rugged mountains and ridges ranging in elevation from 3,000-4,700 feet. The southern boundary of the Blue Ridge Province abuts the Piedmont Province at approximately the 1,700 ft. elevation where a sharp contrast in regional slope occurs.

The portion of White County that falls within the Piedmont Province can be subdivided into three different districts. A small middle-western portion of the County lies within the Dahlonega Upland District, which is a rough and hilly section standing 1,500 to 1,700 feet above sea level. Streams in this district flow south out of the Blue Ridge Mountains District and have cut deep, narrow valleys 500 to 600 feet below the surrounding surface. Running in a southwest to northeast direction in the southwest and central portions of White County, at a width of approximately five miles, is the Hightower-Ridges District. This district contains a series of low, linear, parallel ridges separated by narrow valleys. The Hightower Ridges range in elevation from 1,000 feet in the southwest to 1,500 feet in the northeast. The remainder of White County (southern and eastern portions) lies within the Central Uplands District, which encompasses a series of low, linear ridges 1,300 to 1,500 feet above sea level separated by broad, open valleys. Streams flowing through this section occupy valleys 150 to 200 feet below the ridge crests. (Source: Georgia Department of Natural Resources, Geologic and Water Resources Division. Physiographic Map of Georgia. 1976-)

Geology

Georgia is divided into three geologic provinces based on rock types. These geologic regions conform to the physiographic provinces except that the Blue Ridge and Piedmont physiographic provinces are combined in the Piedmont-Mountain geologic province, within which White County is located.

The Piedmont-Mountain province is underlain by metamorphic and igneous rocks, commonly known as crystalline rocks. The metamorphic rocks are the most extensive in the province and include biotite gneiss, muscovite schist, slate, quartzite, and marble. The igneous rocks are composed primarily of granite. Above the solid rock is a mantle of weathered soil or regolith (decayed rock), which ranges in thickness from 5 to 80 feet, depending upon the type of rock. This mantle of decayed rock is usually thickest in valleys and thinnest on hilltops. (Source: Department of Mines, Mining and Geology, State Division of Conservation, Bulletin Number 65, The Availability and Use of Water in Georgia. 1956-)

Mineral Resources

White County has a variety of mineral resources. Two areas within the County contain granite and related rock outcrops: One area in the mid-northwest section; and one area in the extreme northeast portion of the County. An area of gold deposits, approximately four miles wide by fifteen miles long, bisects the central portion of White County running southwest to northeast in the same general pattern as the Hightower Ridge. This area is known as the "Dahlonega Belt". Paralleling the span of gold deposits to the south is a broken concentration of granite and related rocks. There is also a concentration of mica (colored or transparent mineral silicates that separate

into thin leaves and used dry in roofing materials, joint cement, well drilling compounds and paint) located east of State Route 75 and north of State Route 254.

Other mineral resources found in lesser quantities in White County are: corundum (a very hard mineral that consists of aluminum oxide and which is used as an abrasive); feldspar (crystalline minerals consisting of aluminum silicates which is ground and used in the manufacture of glass, pottery, enamels and abrasives); iron and manganese; sulfide deposits (iron, copper, etc.); talc (a soft mineral that is a basic magnesium silicate and which is used as a filler in rubber); asbestos (a mineral supposed to be inextinguishable when set on fire, used for chemical filters and plastics); sillimanite (a mineral consisting of aluminum silicate which has uses in the production of high temperature refractories); quartzite (a compact granular rock composed of quartz and derived from sandstone); and soapstone (a soft stone having a soapy feel and composed of talc, chlorite and magnetite). (Sources: Georgia Department of Mines, Mining and Geology, The Common Rocks and Minerals of Georgia. Information Circular No. 5, 1934, Revised 1964. Georgia Department of Natural Resources, Georgia Geologic Survey, Mineral Resources Map. 1969.)

A deposit study of mineral deposits in White County was completed in 1964. This study concluded, among other things, that the "volume and grade of gravels in the Nacoochee Valley, Sautee Creek, Bean Creek and Dukes Creek warrant a dredging operation," and that "other economic materials which might be worked are asbestos, mica and soapstone."

Although there are a variety of mineral resources located in White County, mining and quarrying operations are limited to fill material, gold and sand-construction commodities.

Soil Types

An analysis of the types of soils in White County and their suitability for certain land uses is an important component of the Comprehensive Plan. White County has a broad range of soils, which are listed by symbol and name in Table 6-2, along with the limitations of each soil type on crop cultivation, dwelling foundations, septic tank utilization, and commercial structures. Map 6-1 provides a generalized distribution of major soil types in White County.

Of the 55 soil types indicated in Table 6-2, there are 17 soil types, which have been identified with an asterisk (*) as suitable for intensive crop cultivation. The soils most suitable for crop cultivation are found on lesser slopes (2-10%). Most of the soils in White County have limitations for intensive crop cultivation because of steep slopes, severe erosion hazards, flooding, low natural fertility, low organic matter content, shallow depth of rooting zone, rock outcrops, and/or surface stones. Although only 17 soil types are found suitable for intensive crop cultivation, other soil types can be and are cultivated for crops. Furthermore, many of the soils not identified as suitable for intensive crop cultivation are suitable for other agricultural uses such as pasture and woodlands. The vast majority of land areas in White County have soils, which pose severe limitations on dwelling foundations and septic tank utilization. The Masada soil association (MoB, MoB2, MoC2, MoD2) is the most suitable soil for these uses. Approximately 28,190 acres, or 18% of the total County land area, have only slight to moderate limitations on dwelling foundations and septic tank utilization. Even less of the County land area has soils suited for commercial and light industrial uses without extensive adjustments; approximately 26,365 acres, or 17% of the total County land area, contain soils with only moderate limitations on

commercial structures.

White County lies within the Upper Chattahoochee River Soil and Water Conservation District along with Dawson, Forsyth, Hall, Habersham and Lumpkin Counties. Soil and water conservation districts were formed in Georgia by 1957 with the purpose of providing local direction to federal conservation efforts. In addition to basic duties such as coordinating programs and developing annual and long-range plans, the districts sponsor demonstration projects and conservation workshops. (Source: Georgia Soil and Water Conservation Committee, Georgia Resource Conservation Program and Action Plan,.)

TABLE 6-1 Limitations of Soils on Development

| SYMBOL | SOIL NAME (% SLOPE) | FOUNDATION FOR DWELLINGS | SEPTIC TANK UTILIZATION | COMMERCIAL STRUCTURES |
|--------|-----------------------------------|--------------------------|-------------------------|-----------------------|
| AcG | As he stony loam (60-90) | Se | Se | Se |
| AEE | Ashe/Edneville stony loam (10-25) | Se | Se | Se |
| AEF | Ashe/Edneville stony loam (26-60) | Se | Se | Se |
| AmC2* | Appling sandy loam (6-10) | Sl | M | M |
| AWB** | Augusta fine sandy loam (2-6) | Se | Se | Se |
| AwC | Augusta fine sandy loam (6-10) | Se | Se | Se |
| Bfs | Buncombe loamy sand | Se | Se | Se |
| BvF | Burton loam (16-50) | Se | Se | Se |
| Cac** | Cartersville complex | Se | Se | Se |
| CCF | Chandler loam (26-60) | Se | Se | Se |
| Con* | Conaree/Starr soils | Se | Se | Se |
| EPD | Edneville/Porters loams (10-15) | M | M | Se |
| EPE | Edneville/Porters loams (16-25) | Se | Se | Se |
| EPF | Edneville/Porters loams (26-60) | Se | Se | Se |
| EPG | Edneville/Porters loams (60-80) | Se | Se | Se |
| FaB* | Fannin fine sandy loam (2-6) | Sl | M | M |
| FaC* | Fannin fine sandy loam (6-10) | Sl | M | M |
| FaE | Fannin fine sandy loam (10-25) | MtoSe | Se | Se |
| FbC2* | Fannin sandy clay loam (6-10) | Sl | M | M |
| FbE2 | Fannin sandy clay loam (10-25) | Se | Se | Se |
| FcF | Fannin soils (26-60) | Se | Se | Se |
| Gut | Gullied land | | Not Rated | |
| HIB* | Havesville sandy loam (2-6) | Sl | M | M |
| HIC* | Havesville sandy loam (6-10) | Sl | M | M |
| HIE | Havesville sandy loam (10-25) | MtoSe | Se | Se |

TABLE 6-1 (Continued)
Limitations of Soils on Development

| SYMBOL | SOIL NAME (% SLOPE) | FOUNDATION FOR DWELLINGS | SEPTIC TANK UTILIZATION | COMMERCIAL STRUCTURES |
|-----------|--|--------------------------|-------------------------|-----------------------|
| HJC3* | Hayesville sandy clay loam (6-10) | Sl | M | M |
| HJE3 | Havesville sandv clay loam (10-25) | Se | Se | Se |
| HKC3 | Havesville/Rabun clay loam (6-10) | Sl | M | M |
| HLC* | Havesville/Rabun loams (6-10) | Sl | M | M |
| HLD | Havesville/Rabun loams (10-15) | M | Se | Se |
| HLF | Havesville/Rabun loams (26-60) | Se | Se | Se |
| HSC* | Hiwassee loam (2-10) | Sl | SltoM | M |
| HSD* | Hiwassee loam (10-15) | M | M | M |
| HSF | Hiwassee loam (16-40) | Se | Se | Se |
| MCE | Musella cobbly loam (6-25) | Se | Se | Se |
| MCG | Musella cobbly loam (26-70) | Se | Se | Se |
| MoB* | Masada fine sandv loam (2-6) | Sl | Sl | M |
| MoB2* | Masada fine sandv loam (2-6) | Sl | Sl | M |
| MoC2* | Masada fine sandv loam (6-10) | Sl | Sl | M |
| MoD2* | Masada fine sandv loam (10-15) | M | M | Se |
| MuE2 | Musella gravelly clay loam (10-25) | MtoSe | Se | Se |
| RaE | Rabun loam (16-25) | M | Se | Se |
| RbD3 | Rabun clay loam (10-15) | M | M | Se |
| RbE3 | Rabun clay loam (16-25) | Se | Se | Se |
| Sta* | Starr fine sandv loam | Se | Se | Se |
| TbE | Tallapoosa cobbly fine sandv loam (6-25) | Se | Se | Se |
| TcE | Tallapoosa fine sandv loam (10-25) | MtoSe | Se | Se |
| TdG | Tallapoosa soils (26-70) | Se | Se | Se |
| TIC* | Tusquitee loam (6-10) | Sl | Sl | M |
| TID | Tusquitee loam (10-25) | MtoSe | MtoSe | Se |
| TIF | Tusquitee loam (26-60) | Se | Se | Se |
| TmE | Tusquitee stony loam (10-25) | Se | Se | Se |
| TmF | Tusquitee stony loam (26-60) | Se | Se | Se |
| Toe* (**) | Toccoa soils (0-2) | Se | Se | Se |
| Wed** | Wehadkee soils (0-2) | Se | Se | Se |
| WgC* | Wickham fine sandv loam (6-10) | Sl | Sl | M |
| WgD | Wickham fine sandv loam (10-25) | MtoSe | MtoSe | Se |
| WgF | Wickham fine sandv loam (26-50) | Se | Se | Se |
| WnD3 | Wickham sandv clay loam (10-15) | M | M | Se |

Notes: * - Suitable for farming (cultivated crops) without fertilization, drainage or other adjustments. ** - Hydric soils, according to Soil Conservation Service.

Se - Severe limitations, extensive adjustments are needed before the soil is suitable for the specified purpose. M - Moderate limitations, some adjustments needed for use. Sl - Slight limitations, little or no adjustments needed for use.

SOURCE: Soil Survey of Dawson, Lumpkin and White Counties, Georgia U.S. Department of Agriculture, Soil Conservation Service, 1972.

Table 6-2 provides acreage estimates for the most frequent soil types in White County, as well as total acreage estimates of soils with certain characteristics (hydric soils, steep slopes, etc.).

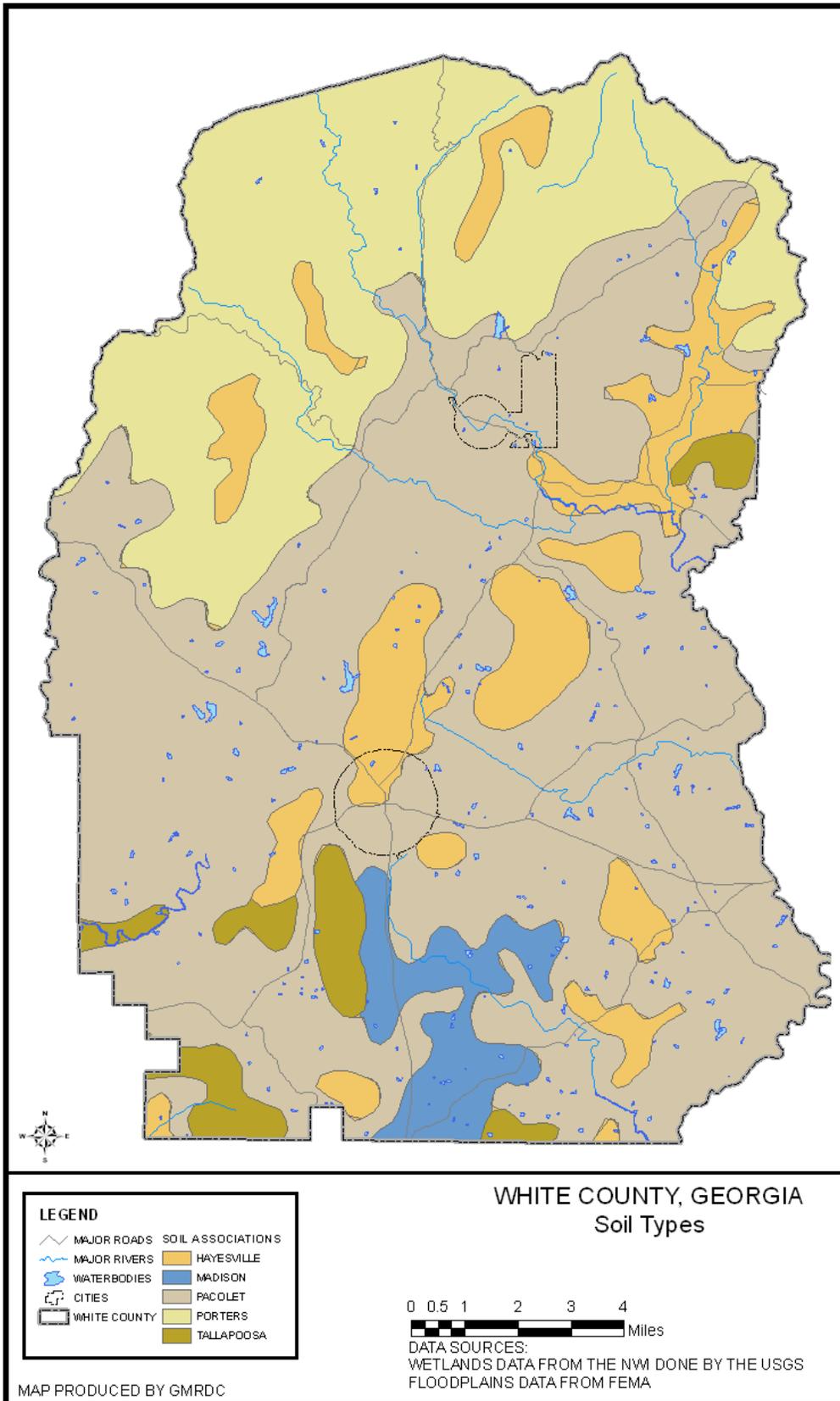
TABLE 6-2
Acreage And Percent Of Total County Land By
Most Frequent And Selected Composite Soil
Types

| SYMBOL | SOIL NAME (% SLOPE) | TOTAL ACRES | % TOTAL COUNTY ACREAGE |
|--------------------|---|-------------|------------------------|
| TdG | Tallapoosa soils (26-70) | 20,825 | 13.39 |
| HIE | Havesville sandv loam (10-25) | 15,485 | 9.96 |
| EPF | Edneville/Porters loams (26-60) | 11,035 | 7.10 |
| FaE | Fannin fine sandy loam (10-25) | 7,610 | 4.89 |
| TID | Tusquitee loam (10-25) | 6,600 | 4.24 |
| HJE3 | Havesville sandy clay loam (10-25) | 6,580 | 4.23 |
| AEF | Ashe/Edneville stony loams (26-60) | 5,820 | 3.74 |
| TmF | Tusquitee stony loam (26-60) | 4,995 | 3.21 |
| FbE2 | Fannin sandy clay loam (10-25) | 4,220 | 2.71 |
| FPE | Edneville/Porters loams (16-25) | 4,065 | 2.61 |
| HIC | Havesville sandy loam (6-10) | 3,880 | 2.49 |
| Cac | Cartecav complex | 3,630 | 2.33 |
| Toe | Toccoa soils | 3,615 | 2.32 |
| TIF | Tusquitee loam (26-60) | 3,270 | 2.10 |
| HJC3 | Havesville sandy clay loam (6-10) | 3,230 | 2.07 |
| AcG | Ashe stony loam (60-90) | 3,055 | 1.96 |
| WgD | Wickham fine sandv loam (10-25) | 3,055 | 1.96 |
| — | OTHER SOILS | 44,550 | 28.69 |
| TOTAL | HYDRIC SOILS | 8,385 | 5.39 |
| TOTAL | PRIME AGRICULTURAL SOILS* | 28,655 | 18.43 |
| TOTAL | <u>SOILS WITH 25% SLOPE OR MORE</u> | 54,225 | 34.87 |
| TOTAL | <u>SOILS SUITABLE FOR SEPTIC TANKS**</u> | 28,190 | 18.13 |
| TOTAL | <u>SOILS SUITABLE FOR COMMERCIAL STRUCTURES**</u> | 26,365 | 16.95 |
| TOTAL WHITE COUNTY | | 155,520 | 100.0% |

SOURCE: Soil Survey of Dawson, Lumpkin and White Counties, Georgia. U.S.
Department of Agriculture Soil Conservation Service, 1972.

NOTES: *Excludes the Toccoa soil type, which is considered a hydric soil and therefore not included as prime agricultural soil. **With only slight or moderate limitations.

Map 6-1



Steep Slopes

Due to its location in the Blue Ridge and Piedmont Physiographic provinces, White County has a number of mountains, which pose limitations on development. A total of 34.87 percent (54,225 acres) of the County area qualifies as steep slopes. The highest elevations in White County are located along the northern county boundary with Lumpkin, Union, Towns, and Habersham Counties. This county line also forms the Tennessee Valley Divide, which separates the Chattahoochee River Basin from the Tennessee River Basin. The Tennessee Valley Divide contains some of the highest elevations in North Georgia. Table 6-3 provides a listing of mountains by planning area with approximate elevation.

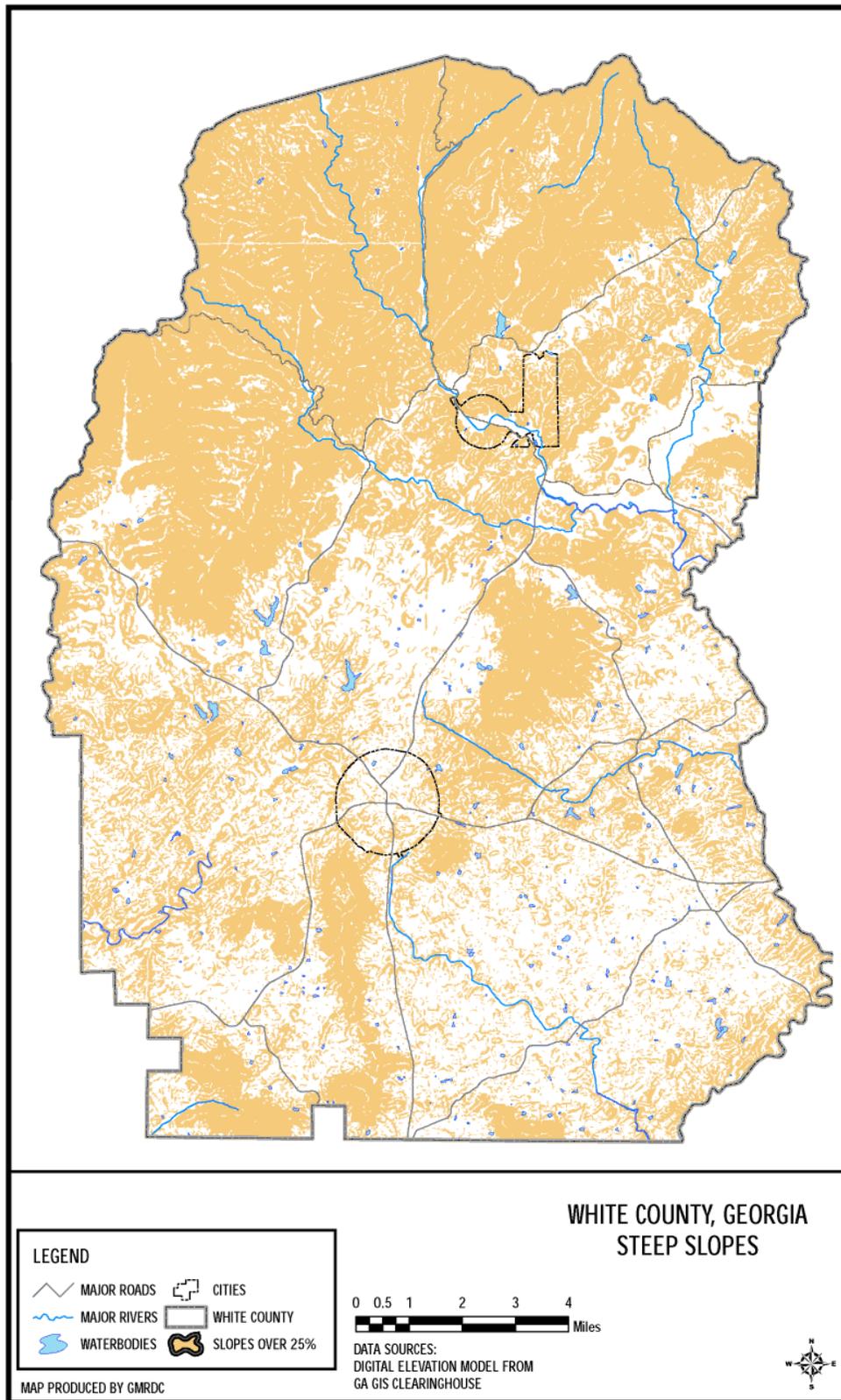
**TABLE 6-3 Mountains In
White County By Planning
Area and Approximate
Elevation**

| Name of Mountain | Planning Area | Approximate Elevation |
|-----------------------|---------------|-----------------------|
| Tatum Mountain | Blue Creek | 1615' |
| Sal Mountain | Blue Creek | 2270' |
| Collins Mountain | Blue Ridge | 2120'+ |
| Horse Range Mtn. | Blue Ridge | 3162' |
| White Oak Mtn. | Blue Ridge | 3040'+ |
| Pinnacle Mountain | Blue Ridge | 3133' |
| Little Buzzard Mtn. | Blue Ridge | 2560'+ |
| Allison Mountain | Blue Ridge | 2920'+ |
| Piney Mountain | Blue Ridge | 3121' |
| Rocky Mountain | Blue Ridge | 3532' |
| Adams Bald | Blue Ridge | 3620' |
| Wildcat Mountain | Blue Ridge | 3760'+ |
| Cowrock Mountain | Blue Ridge | 3590' |
| Yonah Mountain | Mount Yonah | 3156' |
| Pink Mountain | Mount Yonah | 2623' |
| Leadpole Mountain | Mount Yonah | 2130' |
| Skitt Mountain | Mossy Creek | 2076' |
| Trav Mountain | Nacoochee | 4430' |
| Chimney Mountain | Nacoochee | 3357' |
| Lynch Mountain | Nacoochee | 2080'+ |
| Hickory Nut Mtn. | Robertstown | 2780' |
| Little Hkv. Nut. Mtn. | Robertstown | 2681' |
| Stony Knob | Robertstown | 2888' |
| Poor Mountain | Robertstown | 3612' |
| Sheep Rock Top | Robertstown | 3572' |
| Trail Ridge | Robertstown | 2690' |
| York Ridge | Robertstown | 3422' |
| Smith Mountain | Robertstown | 2800'+ |
| Piney Mountain | Shoal Creek | 2314' |
| Walker Mountain | Shoal Creek | 2585' |
| Long Mountain | Shoal Creek | 2249' |
| Ash Mountain | Tesnatee | 2142' |
| Allison Ridge | Tesnatee | 2368' |
| Long Ridge | Tesnatee | 3200'+ |
| Tatum Mountain | White Creek | 1615' |
| Gerrell Mountain | White Creek | 1725' |
| Dean Mountain | White Creek | 1980' |

SOURCES: Georgia Department of Transportation, General Highway Map for White County, 1983.
United States Geological Survey. 7.5 Minute Quadrangle Maps for White County Area.

The complex terrain of White County results in a significant area that is impacted by steep slopes. As noted earlier, the greatest occurrence of steep slopes is found in the northern portion of White County. The U.S. Forest Service's Chattahoochee National Forest, and a number of Wildlife Management Areas already protect much of this area. Despite large areas of already protected land, steep slopes are located throughout the area and need special consideration (See Map 6-2). Development on steep slopes can be problematic because of issues relating to environmental quality and public health and safety. Steep slopes are generally composed of thin soils that are easily eroded. If development occurs on steep slopes, eroded sediment enters streams and impacts surface water quality and aquatic habitat. Steep slopes commonly contain distinctive natural settings because of high elevations, unique aspect to sun angles, and other factors that lend themselves to particular habitats of threatened or endangered species. Along with these environmental reasons, excessively steep slopes are also not suited for development. Development has the potential to induce landslides, and the operational capability of septic drain fields is reduced, and may create health and safety concerns for local residents. To some extent, a septic system can overcome issues associated to steep slopes, but the system must be designed with slope considerations in mind. The building permitting process is a useful measure in maintaining citizen's general welfare during development periods, and it should address septic placement on steep slopes. Further, development on steep slopes creates accessibility problems for emergency vehicles and places increased demands on infrastructure. For example, considerably larger pumps are mandatory to overcome gravitational forces in order to supply water to sites located on steep slopes.

Map 6-2



Mountain Protection

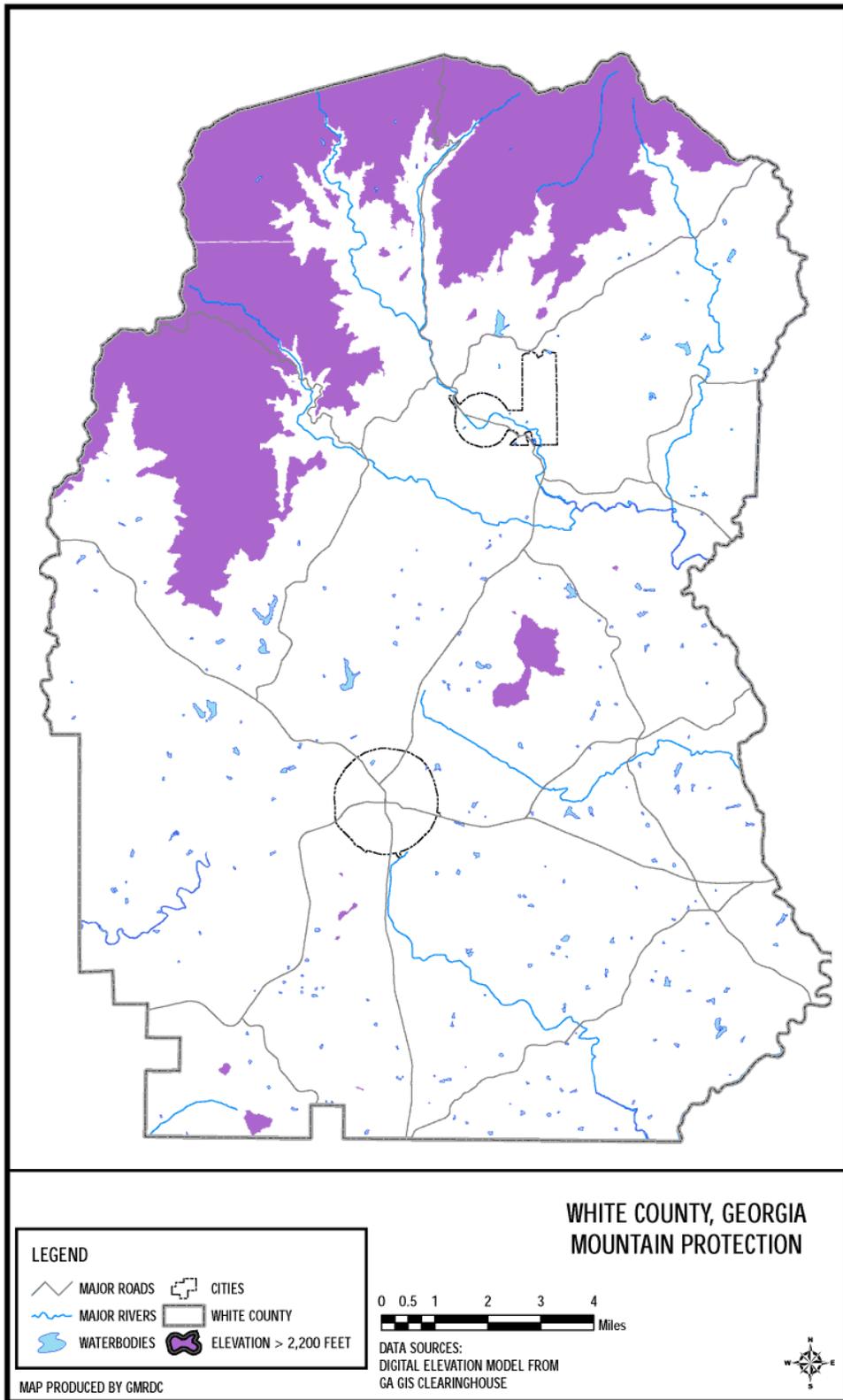
The fragile nature of mountain areas, with their sensitive environmental setting and intrinsic visual qualities, has created the need for special protection of these locations. Mountain Protection is included in the DNR's minimum planning standards, which local governments must develop and implement. Areas to be designated under mountain protection in White County include all locations with all areas that have slopes of 25 percent or greater. Ridge tops, crests, and summits that are located on a protected mountain site still fall within this designation, even if they do not meet the established conditions. The areas within White County that fall within the Mountain Protection area are shown on Map 6-3.

Local governments have the responsibility to develop and adopt a Mountain Protection Plan that address the effects of activities that are located within the Mountain Protection designation. Specific concerns of the Mountain Protection Plan include the health, safety, welfare, and private property rights of county constituents. Unique features of the mountain habitat including threatened or protected plants and animals, visual qualities, ground-water and surface-water resources, and the plan's influence on surrounding natural areas should be addressed. Finally, the duration, or time scale, of activities that are, or will occur, in the designated area need to be incorporated into the plan. The criteria for mountain protection are as follows.

An overlay of the area designated as "Protected Mountains" with property parcels indicates that some mountain areas in White County have been subdivided and are, or could be, developed. The overlay identified numerous areas of heavy development with the "Protected Mountain" designation, and include: the Piney and Wauka Mountain areas, Long Mountain, Leadpole Mountain, the Northwest and East faces of Yonah Mountain, the area between Unicoi State Park and US 17 and 255, and the upper reaches of Towns Creek, and the headwaters of York Creek. Moderate development of mountain areas is permitted. Nonetheless, excess development of these areas is not in the best interests of the natural environment and the community in general.

The County recently adopted a mountain protection ordinance that satisfies the minimum criteria set forth by the Department of Natural Resources.

Map 6-3



Plant and Animal Habitat

Protected Plants and Animals

Georgia's Protected Species Program began in 1973 with the enactment of two state laws: the Endangered Wildlife Act and the Wildflower Preservation Act. These laws provide protection for more than 50 species of plants and about 20 species of animals. Under the Natural Heritage Inventory Program, the Georgia Department of Natural Resources has completed an inventory of rare plants, animals, and natural habitats in Georgia warranting state and federal protection.

According to a report by the Georgia Department of Natural Resources, the natural environment of White County is conducive to three (3) species of protected wildlife and eight species of concern.

Threatened Species:

Bluestripe Shiner (Cyprinella callitaenia)- This threatened fish is found only in the Chattahoochee Watershed and prefers flowing areas in large creeks and medium sized rivers over rocky substrates.

Hightscale Shiner (Notropis hypsilepis)- This threatened shiner prefers habitats of streams flowing over sand or bedrock substrates.

Northern Pine Snake (Pituophis melanoleucus melanoleucus)- This threatened snake grows to between 48 and 68 inches and is identified by its black and dull white to yellowish or light gray color. It is found in dry pine or pine-hardwood forests.

Species of Concern:

Coal Skink (Eumeces anthracinus)- This lizard grows from 5 to 7 in. in length and can be found in mesic forests near streams, springs or bogs.

Blue Ridge Two-lined Salamander (Eurycea wilderae)- This small salamander is distinctive because of its two stripes that run the length of its body, but break apart into spots that cover its tail. The Blue Ridge Two-lined Salamander is found in high elevation springs and seeps that are adjacent to hardwood forests.

Four-toed Salamander (Hemidactylium scutatum)- This salamander, as the name implies, has four toes instead of the common five toes on the hind feet. The four toed salamander is found in swamps and boggy streams and ponds, located near hardwood forests.

Greater Jumprock (Scartomyzon lachneri)- The Greater Jumprock is a sucker that can be found in small to large streams in swift current over rocky substrate.

Masked Shrew (Sorex cinereus)- This shrew has a dark gray coat, with lighter gray underbelly. The Masked Shrew can be found in high elevation mesic forests, field edges, swamps, or mountain bogs.

Pygmy Shrew (Sorex hoyi)- The Pygmy Shrew's habitat includes mountain bogs and grassy openings in high elevation forests. It is an insectivore that grows up to two inches in length.

Red Squirrel (Tamiasciurus hudsonicus)-

The Diana Fritillary (Speyeria Diana)- is a colorful butterfly whose habitat includes openings and fields in wet, rich, forested valleys and mountainsides. Other animals that are not on the Department of Natural Resources protected species list for White County, but could potentially be found in the area include:

Florida Cougar (Felis concolor cougar)- This cat is also commonly known as the panther and mountain lion, is a large unspotted cat with a small, rounded head and long tail. The cougar may exist in northern Georgia (the northern two-thirds of White County) within vast tracts of undisturbed land. Although the environment may be suitable for cougar habitat, no sightings have been reported. However, sightings have been reported in Towns County and within the Warwoman Management Area in Rabun County in 1977.

Indiana Bat (Myotis Sodalis)- The Indiana Bat is a nocturnal insectivore with fine and fluffy, dark gray fur. Its preferred habitat is caves with moderately cool temperatures and high humidity. No sightings have been reported in White.

Red Cockaded Woodpecker is an endangered species that feeds in the upper regions of large pines and nests in over mature pines. Although the species can occur state-wide, no sightings have been reported in White.

Southern Bald Eagle, an endangered species, is a bird of inland waterways and estuarine systems. It requires wetland areas for hunting and has declined in population due to habitat destruction. A sighting of the Southern Bald Eagle has been reported in White County.

(Source: Georgia Department of Natural Resources, Game and Fish Division, Endangered Wildlife Program. 1977. Georgia's Protected Wildlife.)

Fish are also an important part of wildlife in the mountains. The cold-water streams support rainbow, brown and brook trout, of which only the brook trout species is native to the State of Georgia. The Department of Natural Resources maintains listings of primary and secondary trout streams. Primary trout streams have environmental conditions that are most favorable for trout, and the trout are able to both survive and reproduce in these waters. In secondary trout streams, trout are able to survive without assistance but are unable to reproduce naturally, and thus require stocking to maintain their populations. Trout are commonly used as indicator species because of their sensitivity to environmental changes such as sedimentation, insect populations, and water temperature. The State of Georgia protects trout streams through the Erosion and Sedimentation Act, which provides a 50-foot stream buffer on all trout streams with an average annual discharge of greater than 25 gallons per minute. A 25 foot buffer is applied to all streams with an annual discharge of less than 25 gallons per minute. In White County, primary trout streams include: the Cathey Creek watershed upstream from the

Arrowhead Campground Lake, the Chattahoochee River watershed upstream from Georgia Hwy.255 Bridge, and the Town Creek watershed upstream from the mouth of Jenny Creek. Secondary trout streams include: the Chattahoochee River watershed upstream from the Georgia Hwy. 115 to the Georgia Hwy. 255 Bridge, the Little Tesnatee Creek watershed upstream from the mouth of Turner Creek, and the Turner Creek watershed (except those sections listed as primary trout streams).

The mountain region of North Georgia contains a multiplicity of climatic and soil conditions that stimulate the growth of many trees and plants. The slopes, soils, and annual average rainfall are principal natural factors controlling the vegetation of the area. These varied natural conditions have led to habitat for numerous plant species with federal or state protection which include:

Biltmore Sedge (Carex biltmoreana)- This perennial grass like herb is found at high elevations on seepy cliff crevices in partial shade to full sun at high elevations. Notable features include its stout, brittle, scaly stolons and its narrowly tapered, bluish green drooping leaves.

Manhart's Sedge (Carex manhartii)- This perennial grass like herb can be found in loose clumps with leafy shoots. Commonly found at elevations ranging from 2,000 to 4,000 ft, this plant prefers the acidic soils of cove hardwoods.

Pink Ladyslipper (Cypripedium acaule)- The Pink Ladyslipper is a perennial herb that is known for its showy flower and pair of basal leaves, and is found acidic soils of pinelands, rhododendron thickets, and mountain bogs.

Large-flowered Yellow Ladyslipper (Cypripedium parviflorum var. pubescens)- This small perennial has small white leafy stems and elliptic leaves with 1 to 2 yellow flowers. This Yellow Ladyslipper prefers upland oak-hickory-pine forests and mixed hardwood forests.

Florida Torreya (Torreya taxifolia)- This small evergreen tree can be found beneath magnolia forests and mixed hardwood forests on middle to steep slopes with permanent seepage.

Species of Concern:

Sweet-fern (Comptonia peregrina pilosa)

Minniebush (Menziesia

A Moss (Hypnum cupressiforme var. filiforme) (Melanthium latifolium)

Broadleaf Bunchflower

Butternut (Juglans cinerea quinquefolius)

American Ginseng (Panax

Naked-fruit Rush (Juncus gymnocarpus trifolius)

Dwarf Ginseng (Panax

Climbing Fern (Lygodium palmatum typhina)

Staghorn Sumac (Rhus

Wild Coffee (Triosteum aurantiacum expansus)

Woodland Bulrush (Scirpus

Habitats of Concern:

The Georgia DNR has also identified the Shrub Bald and Heath Bald as threatened natural communities. These areas are located on the highest of peaks in Georgia including Tray Mountain, Brasstown Bald, Standing Indian, and Blood Mountains. These balds are composed of a wide variety of plants including Catawba rhododendron, mountain ash, and dwarf willow. A GAP analysis performed by the US Geological Survey Biological Resources Division identified only 281 acres of Heath Bald in Georgia (Source: Georgia Department of Natural Resources, Game and Fish Division. Georgia's Protected Species.)

Efforts are being made to protect the rare, endangered and protected species of plants in Georgia. Public and private groups such as the University of Georgia and the Georgia Plant Conservation Alliance are studying and attempting to preserve rare plants and attempting to return them to their original landscapes. Even with these efforts though, rare species continue to be lost for many reasons, including the drying of wetlands and heavy growth of rhododendrons, mountain laurel and other shrubby plants that shut out light and inhibit reproduction (Source: Georgia Conservation Alliance).

Major Forest Types and Vegetation

Table 6-5 provides a general overview of the major forest types based on ranges of elevation in White County. Table 6-6 also offers a listing of 60 tree species, which are native to Georgia and found in the mountain and piedmont areas. The various tree species listed in Table 6-6.

**TABLE 6-5 General
Forest Types By
Elevation**

| FOREST TYPE | LOCALE | APPROXIMATE ELEVATION RANGE |
|-------------|------------------------------------|-----------------------------|
| Oak Ridge | Along crests of Blue Ridge Exposed | 3600' - |
| Open Oak- | south or north-facing slopes Moist | 4000' |
| Pine | valley floors Dry ridge slopes of | 2100'- |
| Mixed | Piedmont | 3800' |

SOURCE: Institute of Community and Area Development, University of Georgia. The Atlas of Georgia.

TABLE 6-6 Native Trees In The Region

| Common Tree Name | Frequent Locations Found | Common Tree Name | Frequent Locations Found |
|---------------------|--|-------------------|---|
| Eastern White Pine | Cool, moist coves and valleys | White Oak | Dry, sandy soils in piedmont and mountains |
| Loblolly Pine | Abundant in piedmont | Post Oak | Plentiful in poor or dry soils |
| Shortleaf Pine | Heavy clay soils in upper piedmont | Chestnut Oak | Moist, fertile soils near streams in piedmont |
| Virginia Pine | Mountains and upper piedmont | Northern Red Oak | Stream banks and low rocky hillsides of lower mountains |
| Pitch Pine | Dry mountain ridges and slopes | Southern Red Oak | Dry, gravelly uplands but not in high mountains |
| Table Mountain Pine | Dry mountain ridges and slopes | Black Oak | Hillsides in piedmont and lower mountains |
| Hemlock | Along mountain streams and fertile slopes | Water Oak | Fertile valleys and hillsides |
| Eastern White Pine | Fertile soils in piedmont and mountains | Scarlet Oak | Moist, deep, fertile soils of mountain coves |
| Loblolly Pine | Streams and swamps in fertile soils | Blackjack Oak | Stream banks and rich, damp soils in mountains |
| Shortleaf Pine | Low, flat woods and river bottoms | American Elm | Moist soils usually near streams only in mountains |
| Virginia Pine | Common on well drained soils | Slippery Elm | Deep, rich, moist soils throughout state |
| Pitch Pine | Poor soils on uplands | Winged Elm | Typical of abandoned fields on dry soils |
| Table Mountain Pine | Sandy soils in piedmont | Georgia Hackbeny | Occasional on hillsides or rich moist soil in piedmont |
| Hemlock | Mountain valleys, streams and swamps in piedmont | Red Mulberry | Stream banks throughout state except higher mountains |
| Black Walnut | Stream banks | Cucumber Tree | Stream banks throughout state |
| Shagbark Hickory | Stream banks | Umbrella Magnolia | Best growth in rich soils of mountain coves |
| Carolina Hickory | Stream banks of lower mountains and piedmont | Mountain Magnolia | Various species throughout state |
| Mockernut Hickory | Cool, rich soils in mountains | Yellow Poplar | Old fields, ditch and stream banks throughout state |
| Pignut Hickory | Streams and fertile lowlands in piedmont and mountains | Sassafras | Most abundant on mountain slopes |
| Sand Hickory | Low grounds and stream banks in piedmont and mountains | Sweetgum | Fertile, well drained soils on hillsides and valleys |
| Bitternut Hickory | Moist soils usually along streams | American Sycamore | Rich, moist soils throughout state |
| Black Willow | Piedmont and mountains, originally abundant | Service Berry | Valleys and hillsides in piedmont and mountains |
| Eastern Cottonwood | Upland woods on dry, sandy soils | Black Cherry | Moist, deep soils near streams, mostly in piedmont |
| River Birch | Rich uplands or moist bottom lands in piedmont | Hawthorne | Fertile hillsides in eastern part of state |
| Sweet Birch | Dry gravelly uplands | Honey Locust | Deep, moist soils in mountains and piedmont |
| Blue Beech | Upland soils on rocky ridges and bluffs | Black Locust | Steep hillsides in mountains |
| Eastern Hophornbeam | Small streams, edges of low grounds | Eastern Redbud | Fertile, well-drained soils throughout the state |
| American Beech | Common upland tree throughout state | American Holly | Fertile, well-drained soils throughout state |
| American Chestnut* | Common upland tree throughout state | Red Maple | Wooded slopes and stream banks in mountain and |
| Allegheny Chinkapin | Stream banks and low ground in Piedmont | Boxelder | Moist, fertile soils throughout state |

*Endangered due to Chestnut Blight, a bark disease.

SOURCE: Georgia Forestry Commission. Native Trees of Georgia.

Note: The above source describes only 92 of about 250 tree species native to the State of Georgia.

The mountain areas of steep and moderately steep slopes tend to be somewhat dry because of the high degree of water run-off due to a very short standing time in which water can be absorbed. The mountains were once covered by deciduous forest stands existing in a condition known as "climax forests," typified by a high deciduous leaf canopy with little or no undergrowth. These original forest stands have almost completely disappeared due to clear-cutting for commercial timber purposes. This clear cutting has caused the highland slopes to become drier and encouraged more drought-resistant trees to cover the area. The American Chestnut species once filled the mountain region but has now all but disappeared due to drought and blight. Among the tree species now found on these drier, steep slopes are: Pitch Pine, Table Mountain Pine, Allegheny Chinkapin, Post Oak, Chestnut Oak, Scarlet Oak, and Blackjack Oak.

Areas of moderate and lower slopes receive various degrees of sunlight through the day and vary between warm and cool temperatures with moderate to slightly moist soil conditions. In these areas, the Red Maple, Blue Beech, Sweetgum, Black Oak, and certain species of pines, among others, are common.

The lower slopes receive more direct and intense sunlight and tend to contain upland water flowing into the area. These areas sustain a wide variety of tree species listed in Table 6-6 as well as many types of ferns.

The lowest lying areas along stream banks and within floodplains generally remain wet or moist year round and support Hickory, Black Willow, Eastern Cottonwood, River Birch, Sweet Birch, American Beech, Elms, Magnolias, American Sycamore, White Ash, and other tree types as indicated in Table 6-6.

Major Park, Recreation, and Conservation Areas

Chattahoochee National Forest

According to the United States Forest Service, there are 41,276 acres (64.5 square miles) of land that is managed by the Chattahoochee National Forest in White County. The Chattahoochee National Forest's land holdings encompass 26-5 percent of the total 243 square miles in White County.

The National Forest land is located in the northern half of the County. With such a large amount of land under national ownership and management, a detailed description of the Chattahoochee National Forest and the policies of the United States Forest Service is warranted.

The Chattahoochee National Forest encompasses a total of 749,689 acres (1,171 square miles) in northern Georgia and attracts many visitors each year due to its mountain vistas, whitewater streams and scenic landscapes. In addition to its recreational opportunities, the Chattahoochee National Forest has valuable resources of timber, fuel wood, and minerals.

The Chattahoochee National Forest as a whole is comprised mostly of cove hardwoods and upland hardwoods forest types, dominated by tree stands aged 40 to 80 years. Major tree species include white and red oak, hickory, yellow poplar, shortleaf pine, Virginia pine, and eastern white pine. Table 6-7 provides habitat information for the Chestatee and Chattahoochee Wildlife Management Areas.

TABLE 6-7 Wildlife Management Areas Habitat Information By Percentage (In % of Land Within Wildlife Management Area)

| TYPE OF HABITAT | CHESTATEE | CHATTAHOOCHEE |
|-------------------------------|-----------|---------------|
| Upland hardwood | 55% | 54% |
| Yellow pine | 13% | 18% |
| White pine | 6% | 13% |
| Mixed pine-hardwood | 5% | 4% |
| Mixed hardwood-pine | 5% | 3% |
| Cove hardwood | 9% | 5% |
| Regeneration (cut-over) areas | 7% | 3% |
| Wildlife openings | 41 acres | 44 acres |
| TOTAL | 100% | 100% |

SOURCE: United States Department of Agriculture, Forest Service, And Southern Region.

Over 500 species of wildlife are known to exist in the Chattahoochee and Oconee National Forests, including major game such as deer, turkey, squirrel, grouse, quail, raccoon, fox, dove, woodcock and bear. Table 6-8 provides game population data for the Chestatee and Chattahoochee Wildlife Management Areas.

TABLE 6-8 Wildlife Management Areas Game Populations (In Number of Animals Per Acre/Square Mile)

| Type of Game | Chestatee | Chattahoochee |
|--------------|-----------------|-------------------|
| Deer | 21/square mile | 15/square mile |
| Dove | 2/square mile | 2/square mile |
| Ducks | Negligable | Negligable |
| Grouse | 15/square mile | 15/square mile |
| Quail | 1/100 acres | 1/100 acres |
| Rabbit | 1/30 acres | 1/30 acres |
| Squirrel | 1/3 acres | 1/3 acres |
| Turkey | 5/square mile | 10/square mile |
| Bear | 1/2 square mile | 1/1.5 square mile |

SOURCE: United States Department of Agriculture, Forest Service, And Southern Region.

* Data for 2001: Chattahoochee National Forest Management Indicator Species Population and Habitat; 2003.

The Chattahoochee National Forest contains numerous trout streams that support

wild populations of brook, brown and rainbow trout. There are 19,352 acres of public lakes in the Chattahoochee National Forest. Significant trout streams located in White County are Smith Creek, Chattahoochee River, Dukes Creek, Towns Creek, and Tesnatee Creek. To help maintain fishing quality, many streams within the forest are stocked with hatchery-reared fish.

Recreation areas and sites are composed of "dispersed" recreation (hiking, camping, picnicking, fishing, hunting and riding) and "developed" recreation (camping, picnicking, swimming and boating). A description of major recreational areas within the Chattahoochee National Forest is listed below and land areas are identified in Table 6-9.

Appalachian Trail- The Appalachian Trail runs 79.5 miles through the state of Georgia, from its beginning (or ending) point at Springer Mountain to the North Carolina state line near Tate City, Georgia. In all, the Appalachian Trail is 2,170 miles in length, and was conceived by Benton McKaye and constructed with the help of the Civilian Conservation Corps and the Forest Service. Today, the trail is maintained by a group of volunteers and clubs that is organized by the Appalachian Conference. The Appalachian Trail became the first national scenic trail authorized by Congress in 1968.

Raven Cliffs Wilderness- This area was designated a wilderness in 1986, and covers a total of 9,115 acres. The area is known for its many streams, hardwood forests, and waterfalls and mountainous terrain. Elevations range from 1,800 feet to 3,846 feet. Raven Cliffs Wilderness provides 41 miles of trout streams, and habitat for deer, black bear, grouse, turkey, other species. The Appalachian Trail follows the highest ridges for 6-6 miles through the Wilderness, and the 2.6-mile Raven Cliffs Falls Trail is also located within the area. Surrounding Raven Cliffs Wilderness is the Chestatee and Chattahoochee Wildlife Management Areas.

Tray Mountain Wilderness- Tray Mountain Wilderness is a 9,700 acre tract that was established in 1986. The area contains forests that are 60 years or older, mountains that reach up to 4,430 feet (Tray Mountain), 41 miles of trout streams, and 16-5 miles of the Appalachian Trail.

Mark Trail Wilderness- Created in 1991, the Mark Trail Wilderness totals 16,880 acres. The area is home to 65 miles of trout streams that provide habitat for rainbow, brown, and brook trout. Horsetrough Mountain is the highest peak in the Wilderness, and stands at 4045 feet. The Appalachian Trail follows the high ridges that make up the northern and western edges of White County for 14 miles.

Anna Ruby Falls- This 1,600 acre area is located northeast of Helen, and is famous for its double waterfall that is created from Curtis and York Creeks. Curtis and York Creeks begin on the slopes of Tray Mountain before cascading down the 153 and 50 foot drops, respectively, that compose Anna Ruby Falls. From the confluence of the two streams at the falls, Smith Creek then flows into Unicoi Lake, and later into the Chattahoochee River.

Unicoi State Park- Unicoi State Park is located northeast of the City of Helen, and

encompasses a 1,050 acre area. The park offers a number of opportunities for the sightseer and outdoor enthusiast, including 12 miles of hiking trails, 8 miles of mountain biking trails, fishing, canoeing, and pedal boat rental on the site's 53 acre lake. Unicoi State Park also provides cultural and historical programs. Unicoi State Park received 1,134,297 visitors in 1989, making it one of the most heavily visited state parks in Georgia.

Smithgall Woods- Donated to the State by Charles Smithgall Jr., this 5,555 acre conservation area has recovered from a troubled past of mining and logging to become a Heritage Preserve. Smithgall Woods includes activities such as biking, hiking, and fishing on Dukes Creek, which was voted as "one of the Top 100 Trout Streams in the U.S" by Trout Unlimited.

Andrews Cove- Andrews Cove is located in northern White County, on the east side of State Route 17/State Route 75, and provides camping, hiking and fishing opportunities along mountain streams.

**TABLE 6-9
Major Areas And
Recreational Sites Of The
Chattahoochee National
Forest Located in White
County By Type And
Acreage**

| | |
|--|-------------------------|
| Chattahoochee Wildlife Management Area | 25,000 |
| Chestatee Wildlife Management Area* | 25,000 |
| Raven Cliffs Wilderness Area | 9,115 |
| Tray Mountain Wilderness Area | 9,700 |
| Mark Trail Wilderness Area | 16,880 |
| Dukes Creek Falls Recreation Site | 4,500 |
| Anna Ruby Falls Scenic Area | 1,600 |
| Appalachian National Scenic Trail | 79.5 (miles in Georgia) |
| Unicoi State Park | 1,050 |
| Smithgall Woods | 5,555 |

Total, Chattahoochee National Forest in White County 41,226 acres

* Located in northeast Lumpkin and northwest White Counties

Chattahoochee National Forest Plan

The Land and Resource Management Plan (Forest Plan) for the Chattahoochee and Oconee National Forests establishes long-range goals and objectives, specific management prescriptions for 10-15 year time periods, standards and guidelines for

management, and monitoring procedures to assure plan implementation. The Forest Plan should be referenced for information relating to the management of National Forest Lands within White County (source: United States Department of Agriculture, Forest Service, Southern Region. Land and Resource Management Plan, Chattahoochee and Oconee National Forests. (Revised January 2004).

Water Resources

Surface water resources include the water in rivers, smaller streams, lakes, ponds and man-made reservoirs. Rivers within the Blue Ridge physiographic province generally have small drainage areas but relatively high water yields. The rivers in this province have steep, rocky channels and flow swiftly over many rapids and waterfalls. The most important surface water resource in White County is the Chattahoochee River, or "river of the painted rocks."

The Chattahoochee River originates in the Blue Ridge Mountains just above White County and flows in a southerly direction through the Piedmont and Coastal Plain. It is the longest river in Georgia - 436 miles from its source in northeastern Georgia to the Florida line. The drainage area of the Chattahoochee River in the Georgia Mountains region is 1,179 square miles, including all of White County and portions of Hall, Habersham, Lumpkin, Dawson and Forsyth Counties. Smaller tributaries to the Chattahoochee River in the region include Dukes Creek, and Smith, Sautee, and Blue Creeks. The river is dammed to form Lake Lanier south of Gainesville, the first of several impoundments on the river. Below Buford Dam, the Chattahoochee is very heavily used by local governments in the Atlanta region, and supplies 70 percent of metropolitan Atlanta's water needs and over half of the State's residents. The Chattahoochee River is thus a major water resource not only to White County, but the region, State of Georgia and other states as well.

In the headwater region in the Blue Ridge physiographic province, the Chattahoochee River and its tributaries provide recreational opportunities, but are lightly used as sources of water for municipal and industrial facilities. The Upper Chattahoochee River Basin is typified by small streams as well as limited groundwater, making its physical capability for water use quite limited.

Small communities in the upper basin often use groundwater wells, surface water supplies, or a combination. The crystalline rock underlying this area greatly limits groundwater availability.

Groundwater in the upper Chattahoochee River Basin is supplied by the Crystalline Rock Aquifer System, which consists of a complex of igneous and metamorphic rocks that have been folded and fractured. Groundwater occurs in the fractures in the rocks as well as in the pore spaces in the overlying soil, which was derived from the weathering of underlying rocks. Well yields in this aquifer range from one to more than 200 gallons per minute. Water can be found from depths of ten to more than 400 feet. Recharge in the aquifer system is localized.

Water Quality

The overall water quality of the Chattahoochee River in White County is very good. There is a significant number of headwater tributaries classified as primary or secondary streams. In the early 1980s, a dramatic increase in the level of tourism in the City of Helen resulted in discharges from the Helen Water Pollution Control Plant in excess of its permit limitation. The problem of hydraulic overloading has since then been decreased by placement of chemical toilets in public use areas, an upgrading of the Helen Water Pollution Control Plant, and construction of a land application system. Despite the efforts that have been made, some problems can occur. The Chattahoochee River Basin Watershed Protection Plan specifically identifies the headwaters of the Chattahoochee River as susceptible to sediment contamination associated with development on steep slopes. The study also found that the headwaters of the Chattahoochee are susceptible to non-point sources of pollution including metals, fecal coliform bacteria, erosion and sedimentation, and nutrient loading (Source: Chattahoochee River Basin Watershed Protection Plan 1997).

Water Resources Management

As mentioned previously, White County lies within the Upper Chattahoochee River Soil and Water Conservation District. In addition, White County lies within the Chestatee-Chattahoochee Resource Conservation and Development Area, which was established in 1971. The Resource Conservation and Development Areas are local projects in which residents work to improve their economy and the environment through conservation, development, and better utilization of natural resources. Various other agencies such as the U.S. Army Corps of Engineers and the Georgia Department of Natural Resources play major roles in the management and conservation of natural resources in White County.

Public Water Supply Sources

The White County Water Authority is the largest public water provider for the County, and serves approximately 1,400 people in White County. The system contains 72 miles of main line, which follows the major roadways in the county including routes 129, 75, Alt 75, and 115, and provides water to adjacent developments. The system contains two storage tanks of 500,000 gallons and 300,000 gallons. White County Water Authority acquires its water from the Turner Creek surface water intake. Water withdrawal from Turner Creek is 1.8 Million Gallons per Day (MGD). The Department of Natural Resources places special requirements on the areas surrounding a surface water intake. This information is discussed in the Water Supply Watershed section.

Expansion of the White County Water Authority is anticipated in the future to meet the needs of its expanding customer base. The Authority will continue to install lines throughout White County, it is estimated that new storage tanks will be needed in the next 3 to 5 years, and groundwater wells may be installed to increase water capacities in the future.

The cities of Helen and Cleveland use groundwater wells as their water supply sources. Groundwater storage occurs when precipitation infiltrates into the soil. In north Georgia, groundwater supplies come from either shallow regolith (unconsolidated soils)

or the crystalline rock aquifer. Shallow regolith stores water in its pore spaces and has the capacity to receive and accumulate enough water to supply small, single family wells. These shallow wells do not have the yield capacity to sustain municipal water demands, are susceptible to contamination, and should not be used for public water supplies. The deeper crystalline rock aquifers are found throughout the Piedmont and Blue Ridge and have variable yields. Well productivity depends on the on the location and depth of the borehole in relation to fractures in the crystalline bedrock. Because water is transferred and stored in bedrock fractures, a productive well's borehole must cross a combination of either a number of small fractures, or a single large fracture. Determining the location of these fractures is exceptionally difficult. Cleveland and Helen both use groundwater wells that tap into the crystalline rock aquifer as their water supply sources. The City of Helen utilizes four wells, which have an average withdrawal rate of .350 Million Gallons per Day (MGD). The City of Helen recently renewed their permit with Georgia EPD. The City of Cleveland employs four wells that have a withdrawal permit for .841 MGD. The average daily withdrawal for the city is .450 MGD. The renewal date Cleveland's permit is June 15, 2013.

Waste Water Facilities

The majority of White County uses septic systems for wastewater treatment, with the exception of the Cities of Cleveland and Helen, which are served by sewer systems.

Properly functioning septic systems are necessary for public health and welfare. The majority of soils found in White County are classified as having severe limitations for septic systems. Steep slopes are the prominent limiting factor for septic systems in the County. Areas of steep slopes are defined as any slope with an angle of 25 percent or greater. The Department of Human Resources discourages the use of septic tanks on slopes greater than 35 percent. Many developments in White County are currently platted, if not already developed, on steep slopes. Low and moderate density neighborhoods have been developed throughout unincorporated White County, many of which are located on the previously mentioned steep slopes. Proper functioning septic systems require drain fields of varying sizes depending on the soil and slope characteristics.

While high-density development and development on steep slopes can occur, the maintenance of a quality septic system is essential for the public well-being. It is recommended that basic regulations regard the limitations of septic systems throughout White County.

Water Supply Watersheds

White County has adopted a Water Supply Watershed Ordinance that is intended, among other purposes, to protect areas of land upstream from governmentally owned public drinking water intakes and water supply reservoirs through adoption of watershed protection plans. This section briefly describes the county's water supply watershed ordinance; however, the ordinance should be referenced for any development activity.

Water supply intakes and their watersheds, as defined by the DNR, was obtained

in part from DNR's Water Supply Watershed Maps (Map 6-4). The only existing public surface water intake in White County is located on Turner Creek, which has a drainage area of 8.3 square miles. This facility is managed by the White County Water and Sewer Authority, and has a permitted capacity of 1.8 million gallons a day (MGD). The Turner Creek watershed constitutes a "small" watershed according to the "Part V" standards, because it is less than 100 square miles in area. The perennial streams within the Turner Creek Watershed include Turner Creek, Cathey Creek, Tom White Branch, and Ledford Branch. Lake Qualatchee is also included within the Turner Creek water supply watershed area.

Watershed Protection for Tuner Creek Water Supply Watershed

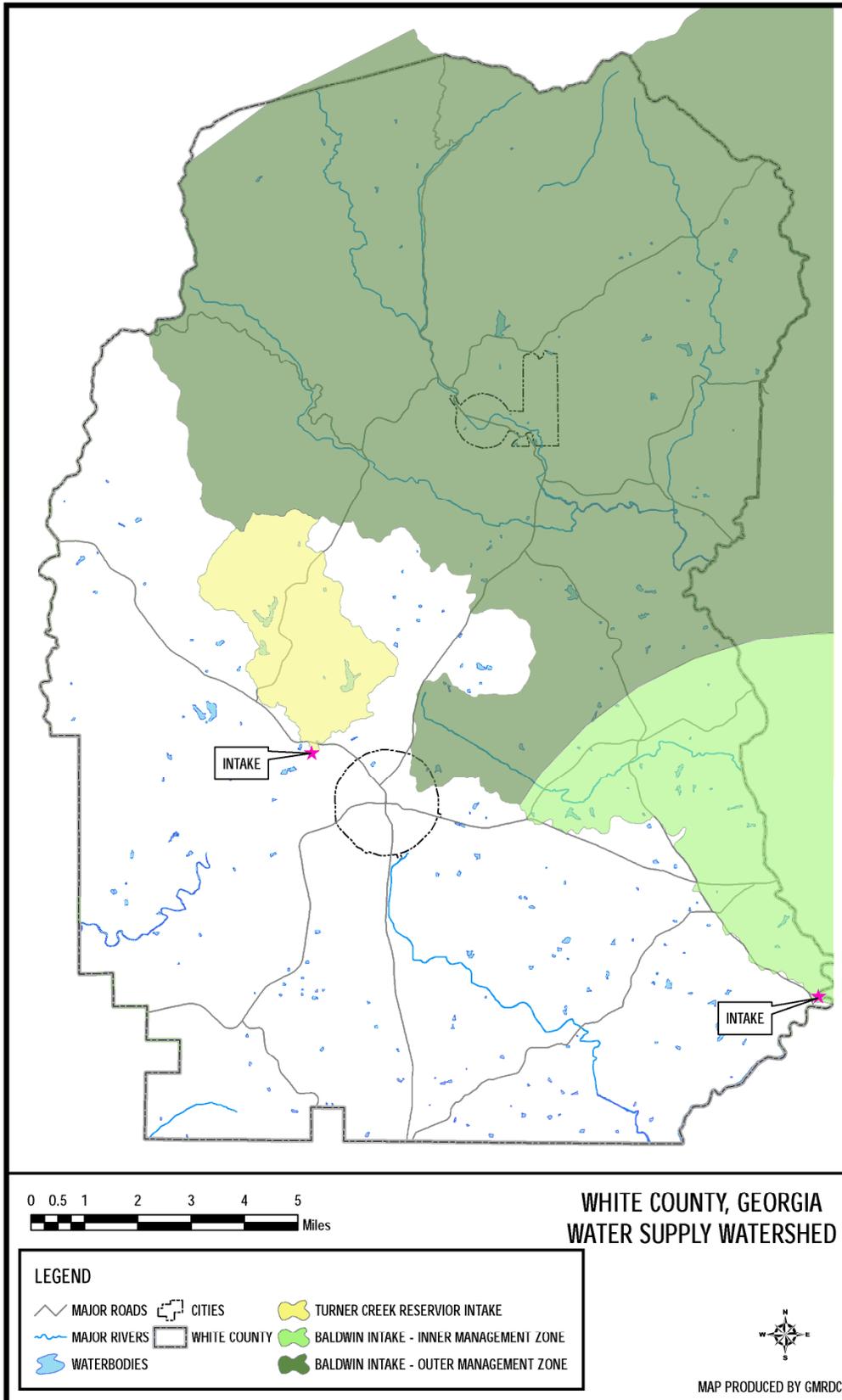
- A buffer shall be maintained for a distance of one hundred (100) feet on both sides of the stream as measured from the stream Banks
- No impervious surface shall be constructed within a one hundred fifty (150) foot setback area on both sides of the stream as measured from the stream banks
- Septic tanks and septic tank drain fields are prohibited in the setback area of 2) above.
- Hazardous waste treatment or disposal facilities are prohibited in the Watershed Protected area, including, but not limited to hazardous materials of the types listed in Section 312 of the Resource Conservation and Recovery Act of 1976
- Only land-disturbing activities that are permitted by this resolution and are approved by the White County Planning Commission through use of Best Management Practices or that have an approved Erosion and Sedimentation Control Plan from the Upper Chattahoochee Soil and Water Conservation District will be allowed within the watershed drainage area of the intake
- All permitted and acceptable land disturbing activities will be properly vegetated or re-vegetated immediately with appropriate grasses or legumes.
- No sanitary landfills, hazardous waste treatment or disposal facilities will be allowed in the watershed drainage area.
- Harvesting of forest products will be performed in accordance with a harvesting plan agreed to by the Georgia State Forestry Commission and an Erosion and Sediment Control Plan approved by the Upper Chattahoochee Soil and Water Conservation District.
- Forestry management within the watershed drainage area will follow the Georgia State Forestry Commission's Best Management Practices Guidelines for Streamside Management Zones, Stream Crossings, Access Road and Their Construction, Timber Harvesting, Site Preparation, Reforestation and Forest Protection (Prescribed Burning, Firelines, and Chemical Fire Retardant).

- No new land application of animal or poultry waste will be allowed without approved nutrient management plan. Such plan will be prepared by either the *Natural Resource Conservation Services* or UGA Cooperative Extension Service.
- Broad use of chemical agents such as pesticides are prohibited within the buffer.
- Fires or burning on the stream banks are not authorized.
- No new industrial development will be allowed in the Watershed drainage area. New commercial developments shall be restricted to a 25% impervious surface area and a lot size minimum of five (5) acres within the Watershed drainage area.
- It shall be the responsibility of every land owner, developer or builder to submit plans for land use alterations within the watershed drainage area to the White County Planning Commission for approval.
- The impervious surface area, including all public and private structures, utilities, or other facilities, of the entire water supply watershed shall be limited to twenty-five (25) percent or existing use, whichever is greater.

A large water supply watershed (drainage area of 100 sq/mi or greater) necessitates different management strategies than small watersheds such as the Turner Creek watershed. White County has developed different standards for the protection of these large watersheds, which follows the recommendations established by the DNR for the protection of large water supply watersheds. The City of Baldwin operates a water intake that is located on the Chattahoochee River, immediately downstream from the confluence with the Soque River. The intake drains approximately 316 square miles upstream of the intake and is therefore classified as a large water supply watershed. The majority of northern and eastern White County falls within the management of this water supply watershed protection area. Within this area, hazard waste facilities are prohibited.

Neither the City of Cleveland or the City of Helen lie within a protected waters supply watershed that require additional water protection standards than the state minimum for water quality protection.

Map 6-4



Flood Plains

Flood Plains are the areas along streams that are normally dry, but become covered with water during flood conditions. Although all streams occasionally become flooded, the condition of a stream's watershed is a major influence on the magnitude of the flooding. Activities such as logging or development may increase the possibility of flooding downstream of the disturbance. Structures erected within the floodplain are at risk of damage during floods. Similarly, they change the pattern of water flow and can increase flooding and damage on adjacent property. Besides being a storage area for excess floodwater, floodplains are important habitat areas and perform a critical role as an area of filtration for water entering into the mainstream channel (SOURCE: "Floods and Flood Plains", USGS, 1993).

The National Flood Insurance Program, which is administered through FEMA, offers flood hazard insurance to residents that reside in communities that have adopted floodplain management ordinances. These ordinances include corrective and preventative measures to minimize the safety and economic costs associated with flooding and include zoning, subdivision, and building requirements. Unincorporated White County, Cleveland, and Helen are all members of the National Flood Insurance Program.

Flood hazard mapping is performed through the National Flood Insurance Program. These Flood Insurance Rate Maps (FIRMS) are used to identify areas of flood hazard. Map 6-5 identifies several surface waters in White County are known to contain flood hazard areas, including the Chattahoochee River, Dukes Creek, Bean Creek, Chickamauga Creek, Cathey Creek, Tesnatee Creek, Turner Creek, Mossy Creek, Flat Creek, Shoal Creek, and White Creek. While the National Flood Insurance Program offers a level of protection from flood hazards, all of these areas should continuously be monitored to ensure proper protection from flood hazards. The City of Helen is particularly at risk from flood hazards because the majority of the city lies within the flood plain. Much of the tourist related development are located within the flood plain. Any development that occurs in these areas requires engineered no-rise certification to be approved by the U. S Army Corp of Engineers.

River Corridor Protection

The river corridor is essential to maintain the proper functioning of a stream and its associated natural environments. The river corridor serves as a filtration system for storm water entering into the stream, an area to store excess floodwaters, and habitat for numerous plant and animal species. These areas also serve as significant educational, scenic, and recreational opportunities.

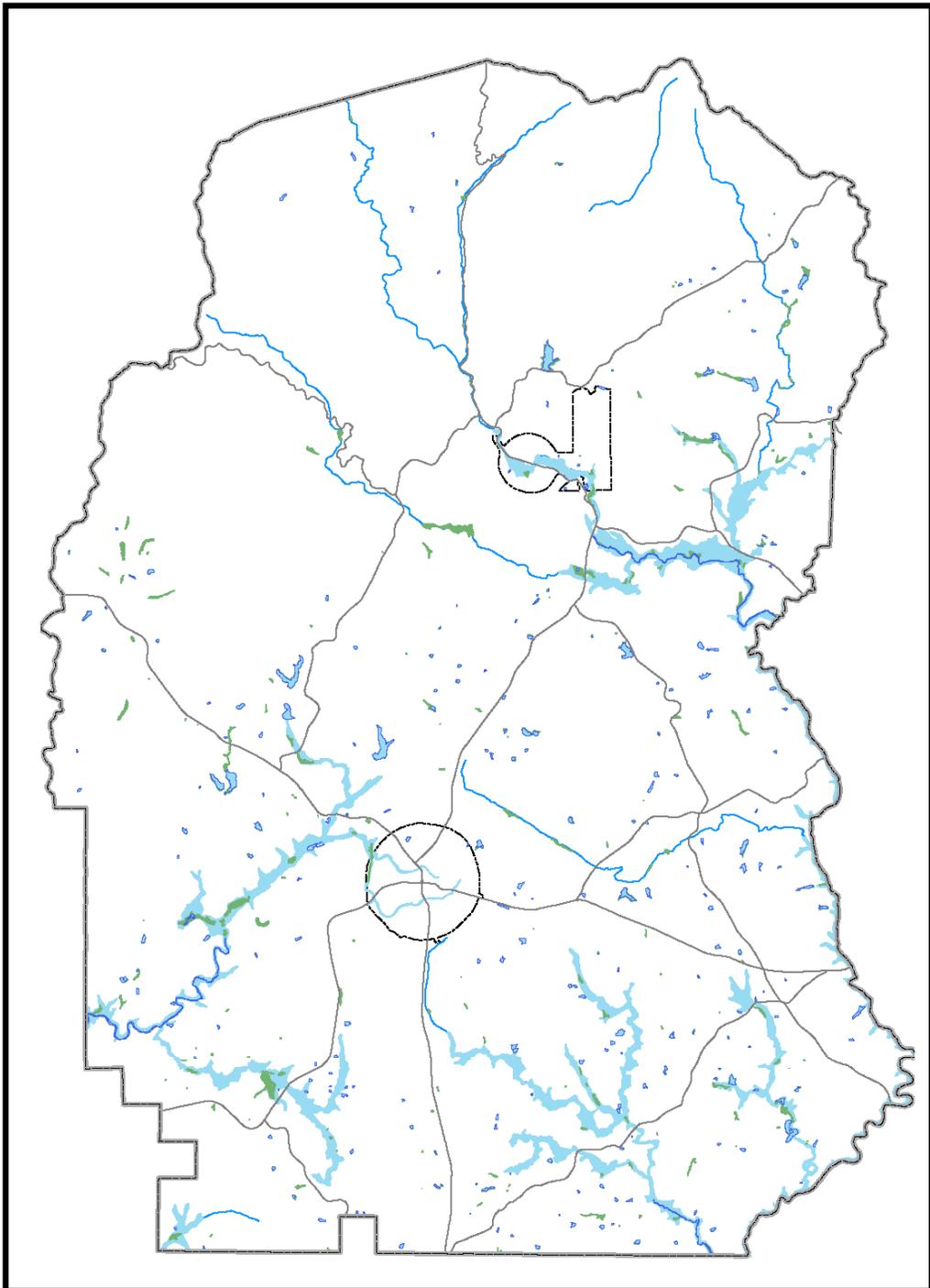
The Department of Natural Resources (DNR) has established criteria for river corridor protection. Based on the criteria for river corridor protection, White County has designated the Chattahoochee River from Smith Island downstream to Hall County as a protected river corridor, as shown in Map 6-6. The following section provides a summary of the river corridor protection ordinance for White County.

River corridor protection measures:

- A one hundred (100) ft. natural vegetative buffer shall be maintained at all times within the protected river corridor except as otherwise provided herein.
- Septic tanks and septic tank drainfields are prohibited within the river corridor, except as provided in Section 4.1 (d) of this ordinance.
- The natural vegetative buffer shall be restored as quickly as possible following any land-disturbing activity within the river corridor.

The ordinance also identifies a number of prohibited activities within the corridor, which include:

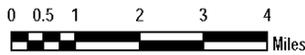
- Hazardous waste or solid waste landfills, or construction and demolition (C&D) landfills.
- Commercial or industrial uses that involve handling hazardous materials other than wastes.
- Handling area for the receiving and storage of hazardous waste.
- Construction within the river corridor is prohibited unless specifically identified as a permitted activity.



LEGEND

- | | |
|---|--|
|  FLOODPLAINS |  MAJOR RIVERS |
|  WETLANDS |  WATERBODIES |
|  MAJOR ROADS |  CITIES |
| |  WHITE COUNTY |

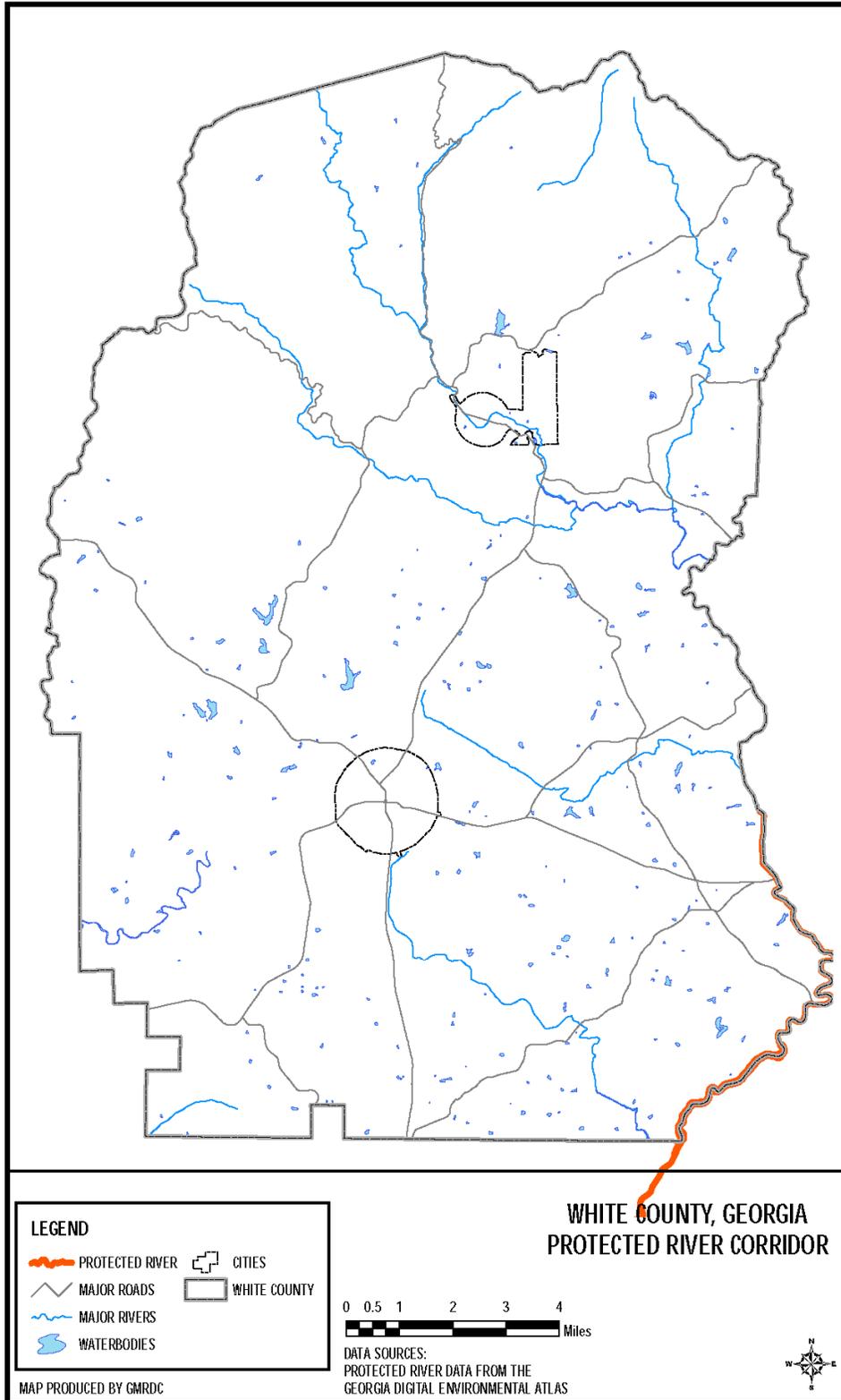
**WHITE COUNTY, GEORGIA
FLOODPLAINS AND WETLANDS**



DATA SOURCES:
WETLANDS DATA FROM THE NMI DONE BY THE USGS
FLOODPLAINS DATA FROM FEMA



Map 6-6



Groundwater Recharge Areas

In the Piedmont and Blue Ridge geologic province, rocks have little porosity, with most groundwater being stored in the overlying soils. The significant recharge areas overly locations with thick soils (a density of two or more geologic contacts per four square miles, and slopes lower than 8%). The significant recharge areas have been mapped by the Georgia Department of Natural Resources in Hydrologic Atlas 18 (1989 edition), and are illustrated in map 6-7. The DNR's determination of significant recharge areas indicates that there are only two such areas in White County: an area west of Mount Yonah, and an area southeast of Cleveland.

White County has developed a ground water protection ordinance for significant recharge areas, which includes both a site plan requirement for locations in the groundwater recharge area and additional protection standards for development of these areas. This groundwater recharge ordinance satisfies DNR's criteria for groundwater recharge protection.

The site plan requirements are summarized below:

- A map or maps, drawn to scale of 1 inch = 100 feet or other approved scale, showing all planned improvements including the width, depth and length of all existing and proposed structures, roads, water courses and drainage ways, water lines, wastewater and storm water facilities, and utility installations, shall be provided by the applicant.
- Location, dimensions and area of all impervious surfaces, both existing and proposed, on the site.
- The orientation and distance from the boundaries of the proposed site to the nearest bank of an affected perennial stream of water body. Delineation of all defined or suspected wetlands, if applicable, should be included.
- Elevations of the site and adjacent lands within 200 feet of the site at contour intervals of no greater than ten (10) feet.
- All proposed temporary disruptions or diversions of local hydrology.
- A map of all planned land disturbance activity shall bear the signature/seal of a registered or certified professional in engineering, architecture, landscape architecture, land surveying, or erosion and sedimentation control, or a County Surveyor, and shall conform to current guidelines as set forth in the Erosion and Sediment Control Ordinance of 1975 as amended.
- Activities to comply with site plan. All development activities or site work conducted after approval of the site plan shall conform with the specifications of said site plan. Significant changes to the site plan that would alter the amount and velocity of storm-water runoff from the site, increase the amount of impervious surface within the development, alter the

overall density of development, result in a considerable increase in the amount of excavation, fill or removal of vegetation during construction or otherwise result in an alteration of the overall appearance of the development as proposed, can be amended only with the approval of White County. Minor changes, such as the realignment of streets or minor alterations to drainage structures and other infrastructure to meet unexpected conditions are exempted from this requirement.

The protection standards for groundwater recharge areas include:

- For all pollution susceptibility areas, new waste disposal facilities must have synthetic liners and leachate collection systems.
- New agricultural impoundments shall meet the followings requirements:
 - For areas of high susceptibility, a liner shall be constructed that is, at a minimum, of compacted clay having a thickness of one-foot and a vertical hydraulic conductivity of less than 5×10^{-7} cm/sec or other criteria established by the Natural Resources Conservation Service.
 - For areas of medium susceptibility, an NRCS approved liner, as described in 5.2.1, shall be provided if the site exceeds 15 acre-feet.
 - For areas of low susceptibility, a NRCS approved liner, as described in Section 5.2.1, shall be provided if the site exceeds 50 acre-feet.
- No land disposal of hazardous waste shall be permitted within any Significant Groundwater Recharge Area.
- For all Significant Groundwater Recharge Areas, the handling, storage and disposal of hazardous materials, as listed in Section 312 of the Resource Conservation and Recovery Act of 1976,(excluding underground storage tanks) and in the amounts of 10,000 pounds or more on any one day, shall take place on an impermeable surface having spill and leak protection approved by the Georgia Department of Natural Resources, Environmental Protection Division (EPD), and conforming to local fire prevention code requirements.
- For all Significant Groundwater Recharge Areas, new above ground chemical or petroleum storage tanks having a minimum volume of 660 gallons must have secondary containment for 110 percent of tank volume or 110 percent of the largest tanks in a cluster of tanks. Such tanks used for agricultural purposes are exempt, provided they comply with all federal requirements.
- For all Pollution Susceptibility Areas, new wastewater treatment basins shall have an impermeable liner approved by EPD.

- For all Pollution Susceptibility Areas, no new storm water infiltration basins may be constructed.

- For all Pollution Susceptibility Areas, wastewater spray irrigation systems of land spreading of wastewater sludge shall be practiced in accordance with Department of Natural Resources criteria for slow rate land treatment with amendments and technical publications to site specific information submitted by a registered professional engineer. An application for a new development permit for activities involving wastewater spray irrigation or land spreading of wastewater sludge must be accompanied by proof that the applicant has received a Land Application System permit from EPD.

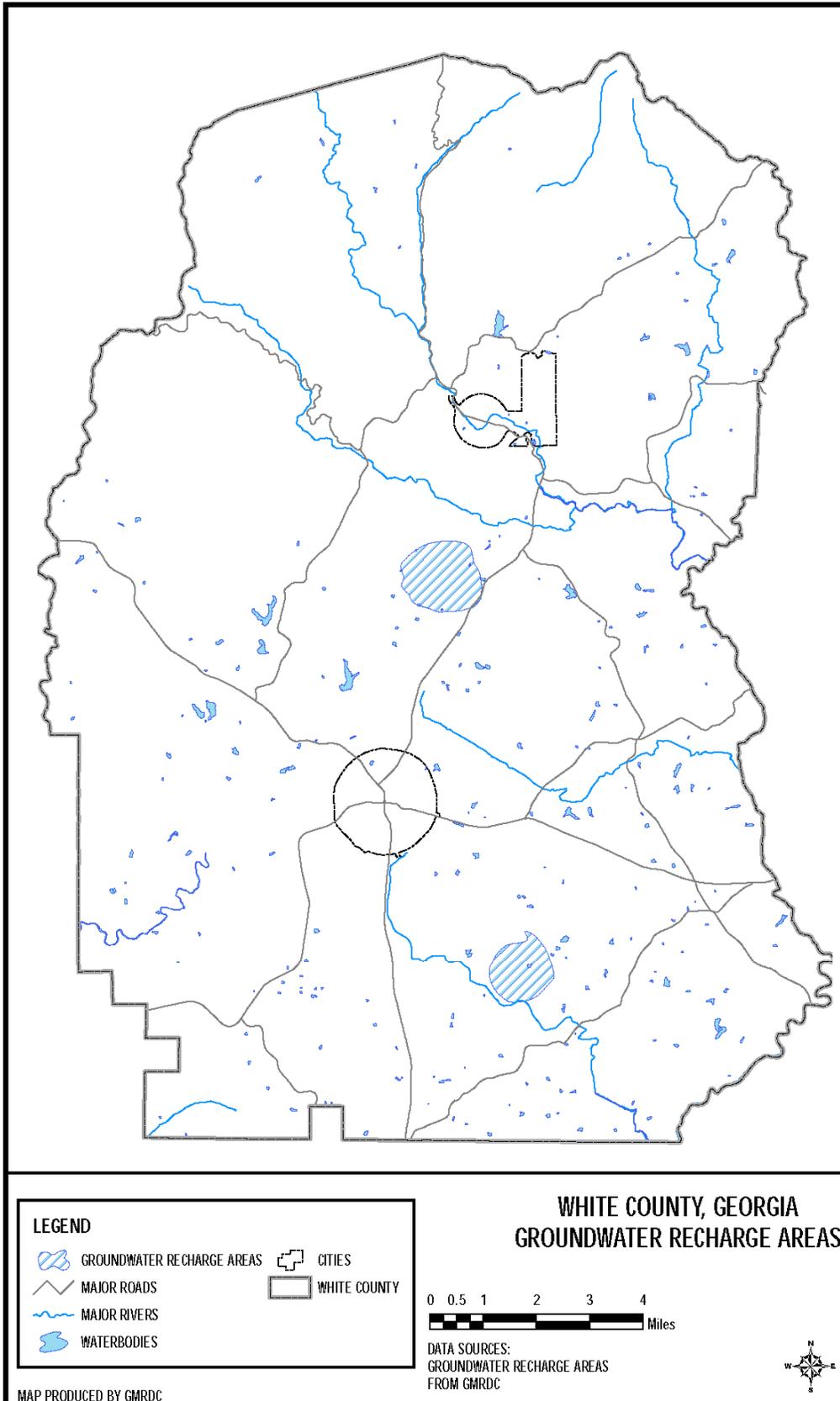
- Minimum lot sizes and septic systems- No construction may proceed on a building or mobile home to be served by septic tank unless the White County Health Department first approves the proposed septic tank installations as meeting the requirements of the Georgia Department of Human Resource for On-site Sewage Management (hereinafter DHR) Manual, and the following requirements:

- New homes served by a septic tank/drainfield system shall be on lots having a minimum size limitations as follows:

- A) 150% of the subdivision minimum lot size calculated based on application of DHR Table MT-1 if they are within a high pollution susceptibility area;
- B) 125% of the subdivision minimum lot size calculated based on application of DHR Table MT-1 if they are within a medium pollution susceptibility area;
- C) 110% of the subdivision minimum lot size calculated based on application of DHR Table MT-1 if they are within a low pollution susceptibility area.

- New mobile home parks served by septic tank/drainfield systems shall have lots or spaces having minimum size limitations as follows:

- A) 150% of the subdivision minimum lot or space size calculated based on application of DHR Table MT-2 if they are within a high pollution susceptibility area;
- B) 125% of the subdivision minimum lot or space size calculated based on application of DHR Table MT-2 if they are within a medium pollution susceptibility area;
- C) 110% of the subdivision minimum lot or space size calculated based on application of DHR Table Mt-2 if they are within a low pollution susceptibility area.



Wetlands

The United States Congress enacted the Clean Water Act to protect the nation's rivers, streams, estuaries, seas, ponds, lakes and wetlands. The term wetlands includes swamps, marshes, bogs and similar areas. The United States Army Corps of Engineers and the United States Environmental Protection Agency formally define wetlands as "those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions." The Georgia Department of Natural Resources "'Part V" standards have adopted this definition.

Wetlands serve many functions and have a number of values. In their natural condition, wetlands temporarily store floodwaters, thereby preventing flood damage. Wetlands can also protect lands from erosion by reducing the velocity of water currents. Many wetlands are areas of groundwater discharge, and some wetlands may provide sufficient quantities of water for public use. A variety of natural products are produced in wetlands, including timber and fish and wildlife. Wetlands also have important environmental quality values such as improving water quality by intercepting stormwater run-off, preventing eutrophication of natural waters, and by supporting delicate aquatic ecosystems (nutrient retention and removal, food chain support, migratory waterfowl usage, etc).

Wetlands can be generally identified by analyzing vegetation, hydrology, and soils common to wetlands. The soils that occur in wetlands, called hydric soils, have characteristics developed under conditions where soil oxygen is limited by water saturation for long periods in the growing season. Hydric soils typically have the following characteristics: 1) they consist of decomposed plant materials (peats and mucks); 2) have a thick layer (8 inches or more) of decomposing plant material on surface; 3) a bluish gray or gray color at 10 to 12 inches below the surface; and 4) the odor of rotten eggs.

Classification of Wetlands

The Georgia Department of Natural Resources has classified wetlands into the following categories:

1. Open water - areas of open water, primarily reservoirs, ponds, lakes, rivers and estuaries.
2. Non-forested emergent wetlands - freshwater marshes dominated by a variety of grasses, sedges, rushes, and broadleaved aquatics associated with streams, ponded areas, and tidally-influenced non-saline waters.
3. Scrub/shrub wetlands- non-forested areas dominated by woody shrubs, seedlings, and saplings averaging less than 20 feet in height; these wetlands may integrate with forested wetlands, non-forested emergent wetlands, and open water.

4. Forested wetlands - natural or planted forested areas having a dominant tree crown closure of hardwoods, pines, gums, cypress, or any combination of these types. These areas are usually in stream or river floodplains, isolated depressions, and drainways, and contain standing or flowing water for a portion of the year. Sub-categories:
 1. Hardwood floodplain forests
 2. Coniferous floodplain forests
 3. Mixed floodplain forests
 4. Non-alluvial forested wetlands.
5. Altered wetlands - areas with hydric soils that have been denuded of natural vegetation and put to other uses, such as pasture, row crops, etc., but that otherwise retain certain wetlands functions and values.

The National Wetlands inventory, developed by the U.S. Fish and Wildlife Service, provides information on wetland locations throughout the nation. The NWI also provides information on the status, extent, characteristics and functions of wetlands, riparian, deepwater and related aquatic habitats to promote the understanding and conservation of these resources. White County has been included in the NWI study. Findings show that the county is sporadically covered with small to moderate sized wetlands (Map 6-5). The highest concentrations of large wetlands are located along a southwest to northeast axis that stretches through the middle of the County. Total acreage figures for hydric soils are indicated in Table 6-3.

For the actual determination of wetlands on specific sites, the *Federal Manual For Identifying and Delineating Jurisdictional Wetlands* (U.S. Army Corps of Engineers, January 10,1989) as well as a competent wetlands expert should be consulted.

Existence of Rare Wetlands

Certain wetlands represent particularly rare natural communities. The "mountain bog" is one notable example of a rare wetland. The mountainous areas in northern portion of the county generally have fewer wetlands than the lower elevations. Nonetheless, "mountain bogs" contain numerous rare or protected species, and some of the greatest species diversity of any habitat in Georgia.

Georgia's mountain bogs are very limited in both number and total acreage, and occur at the heads of streams, along seepage slopes and near springs in the mountains of North Georgia. They are characterized by acidic, peat-rich soils that are constantly saturated with water. The vegetative cover of these bogs varies greatly. Sites commonly contain shrubs, trees, or a diverse mixture of herbaceous species.

Rare species known to exist within mountain bogs include sheep laurel, northern pitcher plant, swamp-pink and the bog turtle. Other species typical of mountain bogs include blackgum, swamp azalea, alder, chokeberries, cinnamon fern, turtlehead and sphagnum mosses.

Only a few mountain bog sites are known. Because of their vulnerability to disturbance from activities such as ditching and drainage, livestock grazing and over collection of rare plants, the long term existence of some of Georgia's mountain bogs are in serious jeopardy. There is a need to protect various vegetation types comprising this broad wetland category. (Source: Ambrose, Jon. 1990 (Winter.) "Rare Wetlands". Georgia Department of Natural Resources Outdoor Report. Volume 5, Number 1, pp. 6-7.)

Local Protection of Wetlands

In accordance with the DNR, White County has developed a wetlands protection ordinance as well as a general wetlands map. While the specific ordinance should be referenced before any development activity is to take place, a summary of the wetlands ordinance is provided in the following paragraphs. The wetlands map is provided to identify areas with a high likelihood of the presence of a wetland. The ordinance allows the Corps of Engineers to ultimately determine if the proposed project is located near or contains a wetland. The wetlands ordinance further establishes a permit requirement for development activities that disturb wetlands, or come within 50 feet of a wetland protection district boundary. Eventually both Cleveland and Helen will need to adopt an ordinance for the protection of wetlands as mandated by the state.

Prohibited uses within the protected wetlands district includes:

- No facilities for the handling, storage, and disposal of hazardous materials, toxic waste, or other contaminants shall be permitted within a Wetland Protection District.
- No hazardous or sanitary waste landfill shall be permitted within a Wetlands Protection District.
- Uses that are prohibited by other Ordinance or Resolution , of White County, are prohibited in a Wetlands Protection District.

Site plans are also necessary for development within the Generalized Wetlands Protection District. The requirements of the site plans include:

- A map of all planned land disturbance activity shall bear the signature/seal of a registered or certified professional in engineering, architecture, landscape architecture, land surveying, or erosion and sedimentation control or a County Surveyor, and shall conform to current guidelines as set forth in the Erosion and Sediment Control Ordinances of 1975 as amended.
- Location, dimensions and area of all impervious surfaces, both existing and proposed, on the site.
- The orientation and distance from the boundaries of the proposed site to the nearest bank of an affected perennial stream or water body.

- Elevations of the site and adjacent lands within 200 feet of the site at contour intervals of no greater than ten feet.
- Location and detailed design of any spill and leak collection systems designed for the purpose of containing accidentally released hazardous or toxic materials.
- All proposed temporary disruptions or diversions of local hydrology.

Federal Protection of Wetlands

Section 404 of the Clean Water Act regulates the discharge of dredged and fill material into waters of the United States and establishes a permit program to ensure such discharges comply with environmental requirements. The U.S. Army Corps of Engineers and the U.S. Environmental Protection Agency administer the Section 404 program. A U.S. Army Corps of Engineers permit is required for such activities that involve the discharge of soil into waters of the United States. If the discharge is predicted to have an "unacceptable adverse effect" on municipal water supplies, shellfish beds and fishery areas, wildlife, or recreational areas, the Environmental Protection Agency may prohibit or restrict such discharges.

In addition to regulatory practices, the United States Environmental Protection Agency (EPA) has prepared a "Wetlands Action Plan" (January 1989) in response to recommendations of the National Wetlands Policy Forum. This plan, which is a short-term agenda, supports the goal "to achieve no overall net loss of the nation's remaining wetlands base, as defined by acreage and function; and to restore and create wetlands, where feasible, to increase the quality and quantity of the nation's wetlands resource base."

To implement this goal, EPA has established seven objectives, including: 1) technical support in state wetlands conservation plans; 2) mechanisms to enhance state and local governments' wetlands protection efforts; 3) improvements in the Section 404 regulatory program; 4) adoption of policies for mitigation of unavoidable wetland impacts; 5) increased information and education; 6) assess the cumulative impacts of wetland loss and degradation; and 7) identify opportunities to restore and create wetlands.

Avoidance and minimization of impact is the primary objective of wetlands management. Local jurisdictions should institute whatever measures are possible to ensure that wetland mitigation or replacement projects are a last resort and not used to justify the destruction of wetlands. Table 6-10 provides a listing of typical wetland mitigation measures that can be applied in cases where alteration/impact of wetlands cannot be completely avoided.

**TABLE 6-10 Typical
Wetland Mitigation
Measures**

-
1. Limit wetland uses to those with minimal impact on natural values (e.g., parks, growing of natural crops)
 2. Limit development densities (e.g., require large lot sizes)
 3. Cluster development on upland sites to protect sensitive and hazardous areas
 4. Elevate structures on pilings or other open works
 5. Route access roads, sewers, and water supply systems around the most sensitive areas
 - 6- Where appropriate, fence wetlands and floodplains to protect natural vegetation and water quality and to reduce erosion
 7. Replant wetland and other vegetation where destruction of vegetation cannot be avoided
 8. Reduce erosion in exposed areas through rip-rap or other measures
 9. Construct fish pools in channelization projects; install fish ladders at dams
 10. Manage game to enhance and reestablish species
 11. Use silt fences and similar measures to control run-off from construction sites; construct detention ponds to trap sediments
 12. Operate dams to provide sufficient flows for downstream fish and wildlife and to periodically flush wetlands
 13. Construct new wetlands and other wildlife areas by diking, land acquisition, or other means to compensate for unavoidable losses
-

SOURCE: American Planning Association, Planning Advisory Service. Protecting Non-Tidal Wetlands. (Report Number 412/413)

Summary of General Environmental Limitations By in White County

The following section provides a generalized summary of the various environmental limitations in areas of White County.

Areas considered within the Mountain Protection criteria are experiencing development. While some development at high elevations is acceptable, caution must be taken due to the environmental sensitivity of these areas. Locations of concern include: the Piney and Wauka Mountain areas, Long Mountain, Leadpole Mountain, the Northwest and East faces of Yonah Mountain, the area between Unicoi State Park and US 17 and 255, and the upper reaches of Towns Creek, and the headwaters of York Creek.

Because of the mountainous terrain in White County, steep slopes (25% or greater) pose at least moderate limitations on development in all planning areas. The Blue Ridge, Helen, Robertstown and Tesnatee planning areas have major limitations on development because of steep slopes. The White County mountain protection ordinance places protections on these areas and others throughout the county where 25% slope exists.

Five areas in the county have major limitations for agricultural crop cultivation: Blue Creek, Blue Ridge, Cleveland, Helen, Robertstown, Tesnatee and Town Creek. These limitations are based primarily on steep slopes and the unsuitability of crop cultivation in soils with steep slopes. However, there are scattered sites within these planning areas, which are suitable for crop cultivation. The Shoal Creek and White Creek planning areas have only moderate limitations on crop cultivation. The Mossy Creek planning area is in general the most suitable portion of the county for crop cultivation.

Although scattered about in the northern one-third of the county, rock land and rock outcrops pose relatively few limitations on development. The only planning area in which rock land and rock outcrops may have a moderate limitation on development is within the Tesnatee planning area.

Regarding soil suitability for septic tanks, the majority of the county has some serious type of limitations. It was noted previously that only 18% of the total County land area is suitably ideal for septic tank utilization without substantial adjustments. Four areas in the county have soils with only moderate limitations on the use of septic tanks: Mossy Creek, Mt. Yonah, Shoal Creek, and White Creek.

Wetlands pose moderate limitations throughout the except in Mossy Creek, where major limitations are imposed due to the prevalence of hydric soils. Due to the abundance of streams and rivers in White County, careful attention should be paid to the identification of wetlands prior to development.

Flood plains exist in varying degrees within White County, Cleveland and in Helen. However, because they exist mostly within narrow valleys and stream corridors, flood plains are considered to pose only moderate limitations in four planning areas: Mossy Creek, Nacoochee, Shoal Creek, and Town Creek. The City of Helen is at risk the most due much of the city and development lying within the flood plain.

As mentioned previously, "significant" groundwater recharge areas are relatively few in White County. Although two such areas have been identified: one in the Mt. Yonah area and a smaller site in Mossy Creek, groundwater recharge areas are anticipated to pose few limitations on development.

In summary, it can be said that the southern and centermost areas in the County (Cleveland, Mossy Creek, Mt. Yonah, Shoal Creek and White Creek) have the most moderate limitations on development, while the most mountainous planning areas (Blue Ridge, Helen, Robertstown, and Tesnatee) have environmental characteristics which pose the most significant limitations on development.