

# Oconee Ranger District

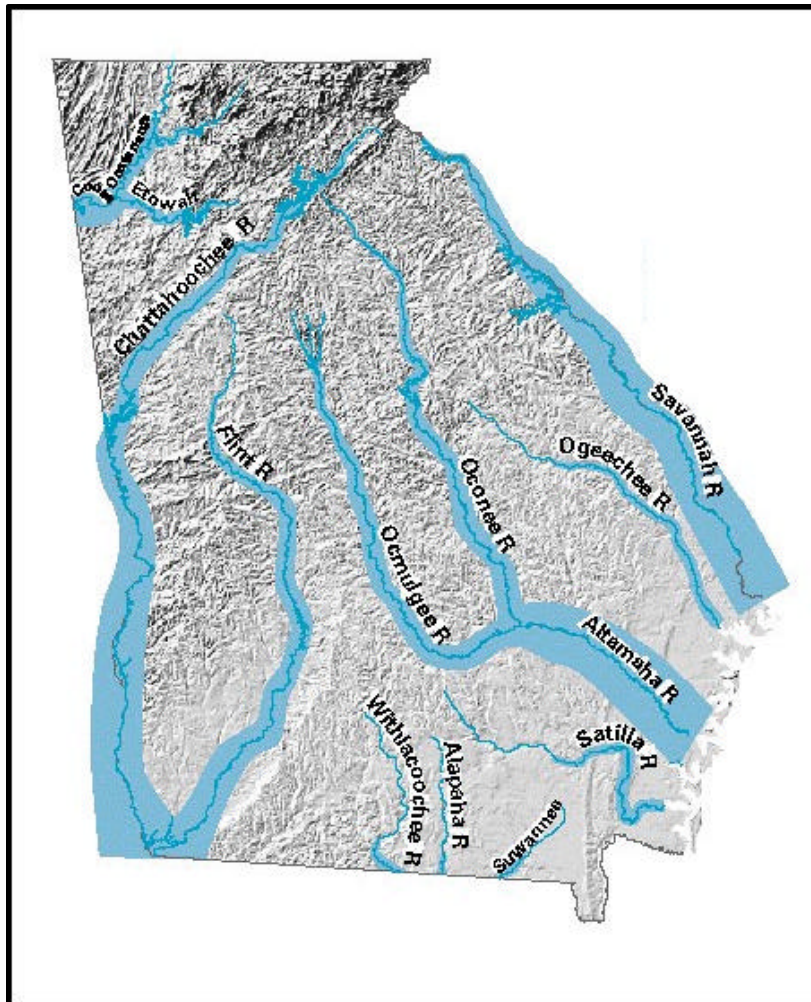
## Watershed Assessment and Opportunity Analysis

For

**Upper Ocmulgee River: HUC 03070103**

**Big Sandy Creek: HUC 0307010310**

**Kinnard/Wise Creek Subwatershed: HUC 030701031003**



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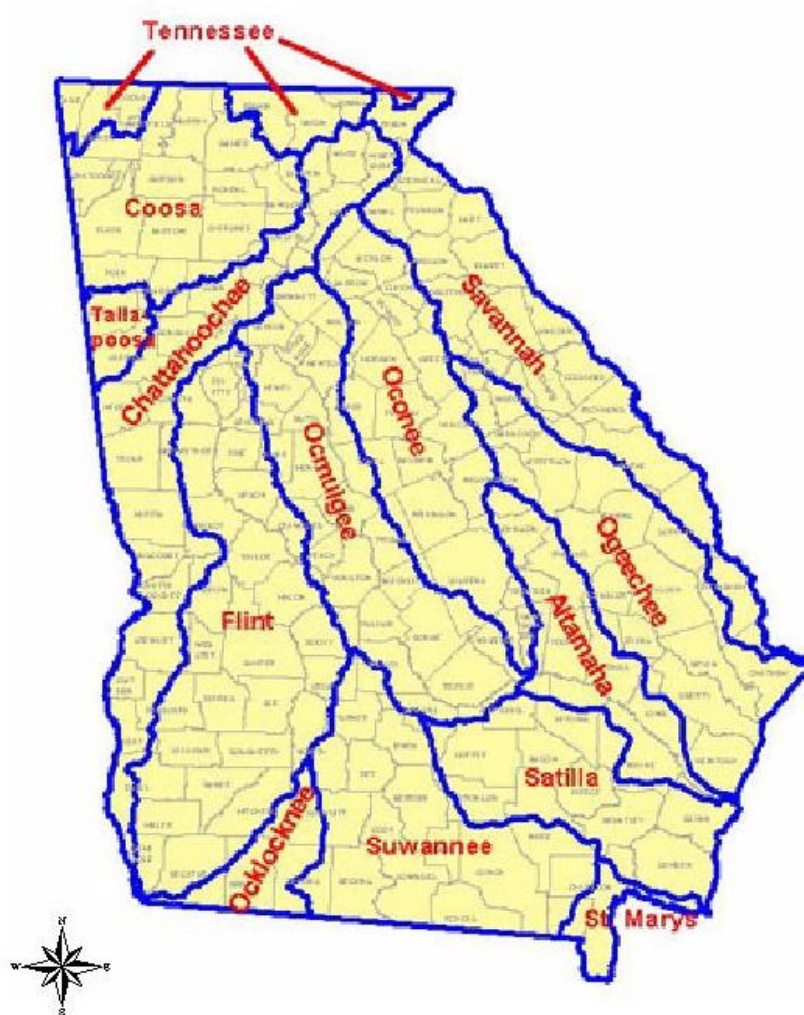
This watershed assessment is a Plan to Project analysis which means the process of applying the Forest Plan to a site specific project location. This assessment will become a key reference source for NEPA compliance in the future. This is not a decision document. No projects are decided within this document, only opportunities to bring specific locations into plan compliance. All will require site specific analysis and further on the ground inventories.

## **1.0 INTRODUCTION**

The Ocmulgee River Watershed is approximately 3.4 million acres in size. The Ocmulgee and Oconee rivers eventually form the Altamaha River which drains into the Atlantic Ocean between Brunswick and Savannah, Georgia.

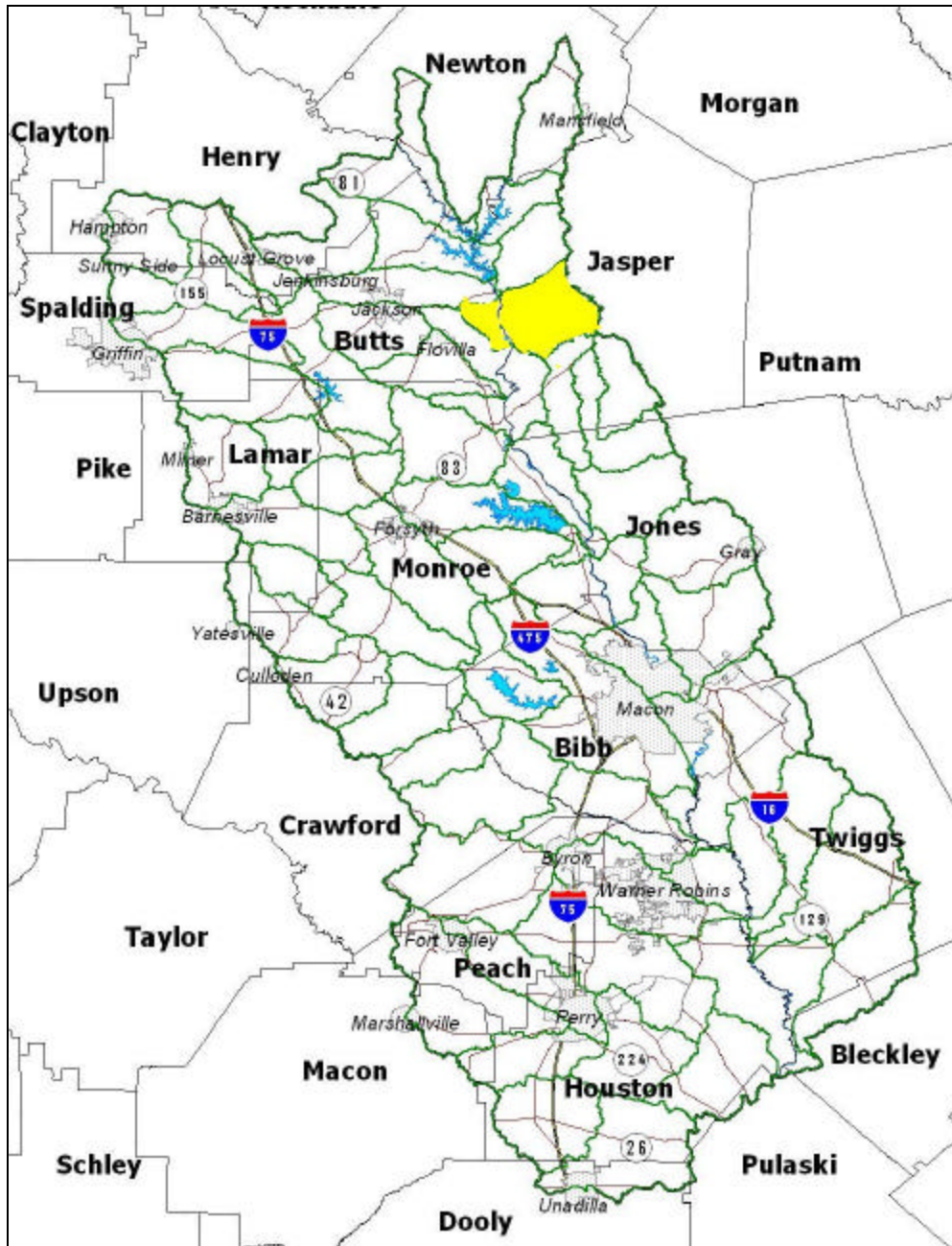
The Upper Ocmulgee River Watershed (03070103) begins on the northeast side of Atlanta, Georgia and runs in a south, southeasterly direction to Hawkinsville located just below Warner-Robins. The geologic fall line located near Macon separates the upper Ocmulgee Basin, situated in the piedmont physiographic Region, from the lower Ocmulgee basin located in the upper Coastal Plain.

**Figure 1-1: Watersheds of Georgia**



The Georgia Department of Community Affairs recently completed the Ocmulgee River Watershed Management Plan in March of 2003. The full report is available at <http://www.georgiaplanning.com/ocmulgee.htm>. The plan was developed to assist local and state agencies with comprehensive watershed planning efforts associated with the study area depicted in Figure 1-2.

**Figure 1-2: Portion of the Upper Ocmulgee River Watershed recently studied by the Georgia Department of Community Affairs**



### **Big Sandy Creek**

The Big Sandy Creek watershed (HUC – 0307010310) located within Jasper and Butts Counties was included in the study area. Big Sandy Creek is approximately 124,251 acres in size. The watershed assessment conducted by the Georgia Department of Community Affairs lists the overall water quality for Big Sandy Creek Watershed as very good. That is not to say that every stream within the watershed is in good condition. Individual streams do appear on the State of Georgia’s 305(b) and 303(d) list of impaired streams.

### **Kinnard and Wise Creek**

The Kinnard and Wise Creek watershed (HUC – 030701031003) is approximately 25,205 acres in size. It also is located in both Jasper and Butts Counties. The Ocmulgee River is approximately 100-200 feet wide in this watershed and it separates the two counties. Frankly, each side of the Ocmulgee River should be classified as a separate watershed as the cumulative effects from one side of the river has little relationship to what happens on the other side.

National Forest System lands only occur on the east side of the Ocmulgee River. NFS lands amount to approximately 30 percent of the total watershed. The focus of this study will be on NFS lands, rather than a basin wide analysis because of the following reasons:

- Existing studies have already analyzed the larger watershed basins.
- NFS ownership is limited and only occurs on the east side of the Ocmulgee River.
- Watershed boundaries at the sixth level huc are inaccurate.

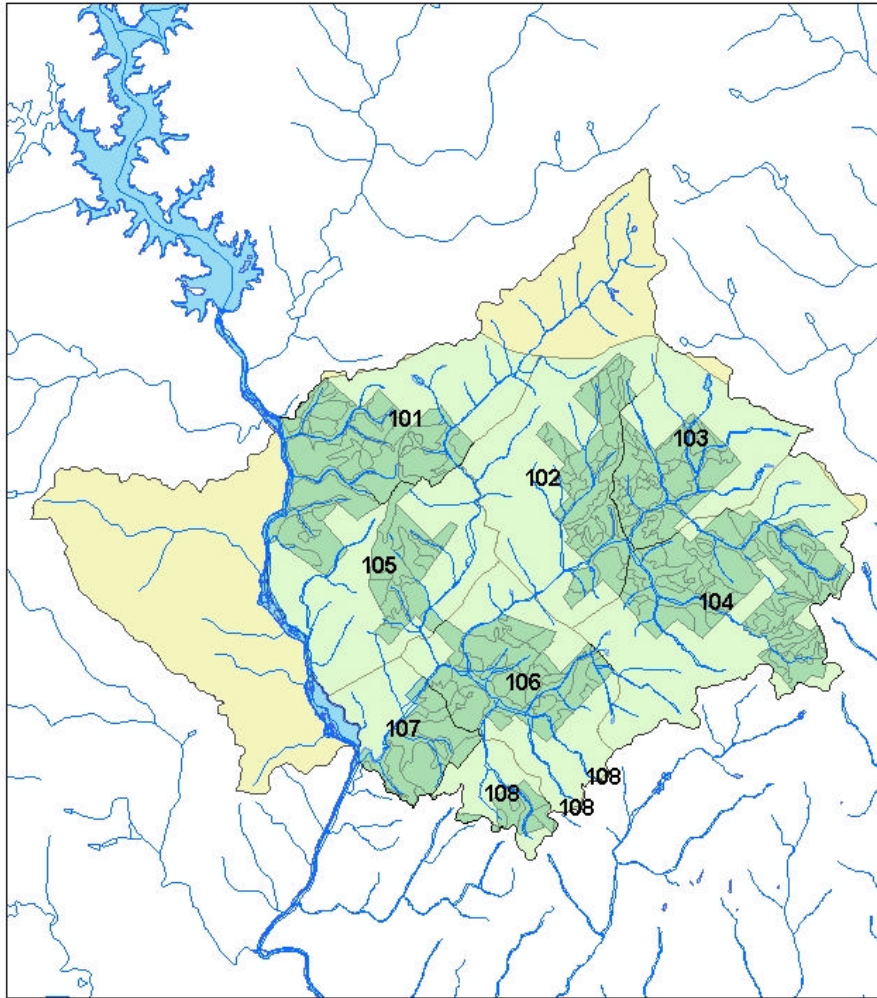
### **Analysis Objectives**

The primary objectives for conducting this analysis are to compare the existing conditions within the watershed with the Forest Plan desired future condition. Differences between the existing and desired condition represent opportunities through enhancement or mitigation to move toward the Forest Plan desired future condition.






*In summary, this is a Forest Plan opportunity analysis based upon a watershed scale assessment. It utilizes existing data that is readily available. It is not a NEPA analysis or a decision document. It is an opportunity analysis designed to highlight management opportunities and or rehabilitation/mitigation needs on NFS lands within the watershed. The primary management activities which have the potential to influence water quality to any meaningful degree are roads, trails and vegetation manipulation. While the opportunities identified may span a relatively large spectrum, the analysis of potential effects will focus on vegetation manipulation, roads and trails.*

Figure 1-3 displays NFS lands in relationship to the watershed

### KINNARD & WISE CREEK HUC 30701031003



#### Legend

- |   |   |   |
|---|---|---|
|  Compartment |  Waterbodies |  HUC 30701031003 |
|  NFS Lands   |  Streams   |   |

## 2.0 FOREST PLAN MANAGEMENT DIRECTION

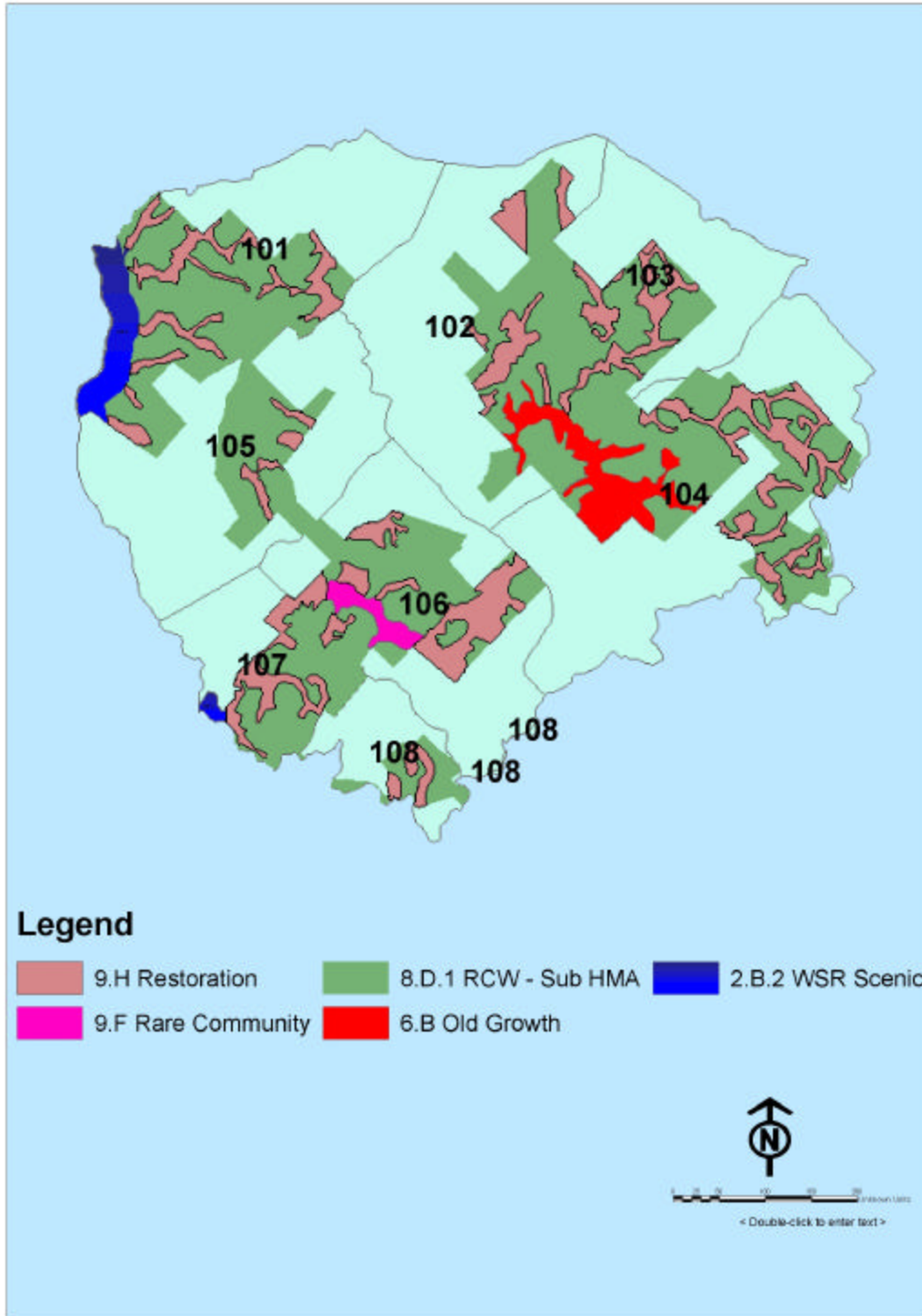
The Chattahoochee-Oconee Land and Resource Management Plan was revised in January 2004. The Revised Forest Plan provides land management direction through management area prescriptions and standards for implementation of the desired future condition.

<i>Management Area Rx</i>	<i>Description</i>	<i>Acreage</i>
<b>2.B.2</b>	Recommended Scenic River Segments	283
<b>6.B</b>	Areas Managed to Restore/Maintain Old Growth Characteristics	424
<b>8.D.1</b>	Red-cockaded Woodpecker (Sub HMA)	5,644
<b>9.F</b>	Rare Communities	106
<b>9.H</b>	Management, Maintenance, & Restoration of Plant Associations to their Ecological Potential	1903
<b>11</b>	Riparian Corridors 1/	NA

1/ The Riparian Corridor management prescription is 'embedded' within each of the other management prescriptions; it does not stand alone. The Riparian Corridor prescription must be identified and considered whenever any of the other management prescriptions are to be implemented at the project/site specific level.



# Kinnard/Wise Creek Management Area Direction



### **3.0 ANALYSIS AREA DESCRIPTION – EXISTING CONDITION**

The entire sixth level watershed (HUC 030701031003) is 25,205 acres in size. That portion of the watershed located on the eastern side of the Ocmulgee River within the Oconee National Forest Proclamation boundary is 18,743 acres in size.

National Forest land ownership is 8,352 acres. Other ownership consists predominantly of private land owners and commercial timber company lands.

#### **3.1 Human Dimension**

##### **Population**

The watershed can be characterized as having a low population density. Based on 2000 census data, the current population within HUC 30701031003 is 1,277 people. This equals a population density of 0.05 persons per acre or 30 people per square mile. It could be described as a rural area with a low population density. Among the lowest population densities in the entire Upper Ocmulgee Watershed.

The median household income in 1999 was \$ 39,890. Home ownership rate is 79 percent and the median house price is \$81,000. Approximately 65% of the population is white, 25% is African American, and the remaining 10% are of various races.

##### **Historical Uses**

Shortly after 1802 when the Creek Indians ceded the territory west of the Oconee River to the federal government, a period of rapid settlement occurred. Almost all of the uplands were cleared for cotton farming. The Civil War devastated the local economy. Sherman's troops crossed the Ocmulgee River at Forty Acre Island located just north of Wise Creek. After the Civil War, lands went fallow until the 1890's. Cotton farming resumed until the boll weevil epidemic and agricultural depression of the late 1920's and early 1930's. The federal government acquired many of the most severely eroded lands. The Soil Conservation Service and the CCC's reforested many of these lands which latter became the Oconee National Forest.

The topsoil from the uplands was deposited in the floodplains or washed further down the watershed. Sediment 4-8 feet in depth is common in the flood plains. Stream channels are still cutting through the sediments trying to re-establish stable streambank conditions.

##### **Hydropower Generation**

Georgia Power operates the Lloyd Shoals Dam on Lake Jackson located immediately north of the project area. Lake Jackson receives water from the watersheds located on the south and east side of Atlanta in the Upper Ocmulgee River Basin. Numerous home owners live all around the shoreline of Lake Jackson. Lake water levels are kept relatively high so that docks and recreation opportunities are maintained. Heavy rainstorms necessitate the release of large amounts of water that result in rapid rises in

water levels. Water levels may go up 10-20 feet after particularly heavy rain events. These peak flows influence streambank stability and channel morphology.



### **Recreation**

Hunting and fishing is the primary dispersed recreation use of the area. Several hunting camps are maintained by the Oconee National Forest to support hunting use. The Wise Creek boat launch is the only access point to the Ocmulgee River located on public lands. The Kinnard Creek Horse Trail, approximately 5 miles in length, connects to the Ocmulgee River horse trail system (17 miles in total). Horseback riding is the major developed recreation use, up and down the length of the Ocmulgee River.

## **Roads and Trails**

The watershed contains State, County and Forest Development Roads. In addition to serving commerce and basic infrastructure needs, these roads are integral to the dispersed recreation uses listed in the previous section.

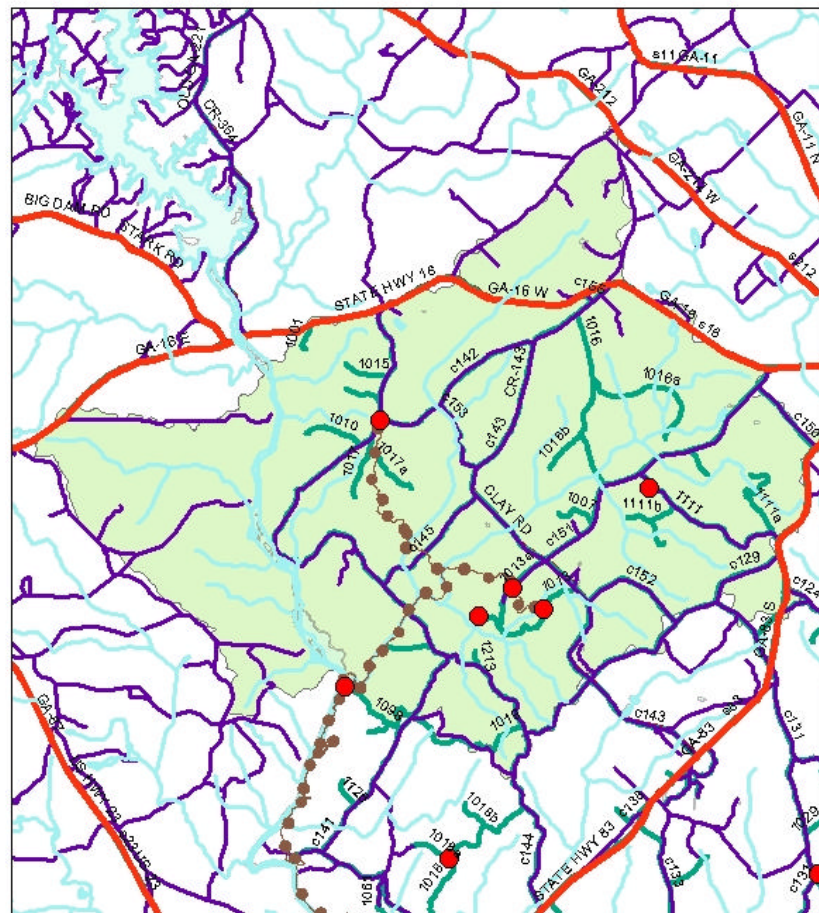
Road density per square mile and the number of crossings are typical parameters used as sediment risk indicators within a watershed. The Big Sandy Creek 5<sup>th</sup> level HUC watershed has an overall road density of 2.07 miles per square mile. It ranks 23<sup>rd</sup> out of 43 5<sup>th</sup> level HUC's on the CONF. In a 6<sup>th</sup> level HUC, that spans a River the size of the Ocmulgee, these indicators are practically meaningless. The volume of water and the sediment loads in the river are a product of not only this watershed, but all the other watersheds upriver. In other words, the road density in the Butts County side of the watershed has no impact on the channel morphology and water quality in those streams located on the Jasper County side of the Ocmulgee River. High road densities per square mile would potentially indicate that sediment may be a risk factor for individual stream reaches.

The average road density per square mile within the 6<sup>th</sup> level HUC is 1.88 miles per square mile. The average density of Forest Service system roads is 0.49 miles per square mile. Compared to other piedmont watersheds, with some NFS lands, the road density per square mile is about average.

Within the 8,352 acres of National Forest System lands, there are 10.1 miles of other ownership roads and 18.0 miles of NF system roads. Approximately 1.4 miles of NF system road is located along an easement off NFS lands. The total road density on NFS lands is 2.15 miles per square mile or approximately the same as that for the overall watershed (2.07 miles per square mile).

**Figure 3-1: Displays the location of roads, horse trails and dispersed hunt camps within the watershed.**

### Roads, Trails & Dispersed Hunt Camps



**Legend**

- oconee\_hunt\_camps
- Trails\_1\_2005
- GA\_Highways
- County Roads
- FDR System Roads
- sandy polygon

### Land Use Categories

There are two main drainages located on the eastern side of the watershed. They are Kinnard Creek (5,024 ac) and Wise Creek (7,086 ac). Harmon Pye Branch (1,735 ac) is a lower order impaired stream that drains directly into Wise Creek. The remaining area (located in the northern portion of the watershed) consists of several small streams that drain directly into the Ocmulgee River.

Table 3.1 lists the major land use categories for each of the major drainages that occur on NFS lands. The land use categories would be similar for the entire watershed. The projected percent of total yearly sediment loads based upon the universal soil loss equation is presented for each land use category (GDNR-EPD 01/2002)

**Table 3.1 – Land Use Categories for the three major drainages that occur on NFS lands and the projected percent of total yearly sediment loads.**

Land Use Category	Kinnard Creek		Wise Creek		Harmon Pye Branch	
	Cover	Sediment	Cover	Sediment	Cover	Sediment
	Percent	Load	Percent	Load	Percent	Load
Open Water	0.04	0.00	0.11	0.0	*	*
Low Intensity Residential	*	0	0.03	0.04	0.10	0.21
High Intensity Residential	*	0	*	*	*	*
Commercial Industrial & Transportation	0.01	0.01	0.04	0.03	*	*
Bare Rock, Sand or Clay	0.01	0.00	0.04	0.00	0.03	0.00
Quarries, Strip Mines, Gravel Pits	*	0	*	*	*	*
Transitional	0.06	0.1	0.49	0.12	0.56	0.16
Deciduous Forest	39.97	1.33	37.37	1.29	45.26	4.53
Evergreen Forest	25.81	0.69	28.03	0.95	28.22	2.03
Mixed Forest	16.55	0.50	21.59	0.74	24.12	1.73
Pasture Hay	11.89	3.62	6.74	3.42	0.49	0.24
Row Crops	5.52	81.13	4.54	79.17	1.17	56.68
Other Grasses, Urban Recreational	*	0	*	*	*	*
Woody Wetland	0.12	0.21	0.12	0.20	0.06	0.23
Emergent Herbaceous Wetlands	0.01	0.01	0.01	0.00	*	*
Roads	*	12.5	*	14.04	*	34.17
Total Acres	5,024.4		7,086.1		1,734.6	

Table 3.1 clearly depicts that row crops, hay pastures and roads are the major sediment producers within the watershed. There are 74.2 miles of roads (all ownerships) within the watershed. Forest Service roads amount to 19.4 miles within the entire 6<sup>th</sup> level watershed basin. Forest Service roads are the only landscape feature that has the potential to produce high sediment yields that are directly under the Agencies control.

Proper design (including application of appropriate BMP's) and maintenance can significantly reduce sediment production from roads.

**Table 3.2 lists the National Forest system roads located within the watershed as depicted in Figure 3.1.**

<i>Route Number</i>	<i>Objective MTC Level - OML</i>	<i>MTC Level Description</i>	<i>Length Miles</i>
<i>1111C</i>	1	Basic Custodial Care (Closed)	0.4
<i>1015</i>	2	High Clearance Vehicles	0.6
<i>1003</i>	2	High Clearance Vehicles	0.5
<i>1016A</i>	2	High Clearance Vehicles	1.9
<i>1016B</i>	2	High Clearance Vehicles	0.6
<i>1010</i>	2	High Clearance Vehicles	0.8
<i>1017A</i>	2	High Clearance Vehicles	0.8
<i>1007</i>	2	High Clearance Vehicles	0.6
<i>1013A</i>	2	High Clearance Vehicles	1.1
<i>1213</i>	2	High Clearance Vehicles	0.2
<i>1001</i>	3	Suitable for Passenger Cars	0.4
<i>1016</i>	3	Suitable for Passenger Cars	2.3
<i>1017</i>	3	Suitable for Passenger Cars	0.8
<i>1111B</i>	3	Suitable for Passenger Cars	0.7
<i>1111A</i>	3	Suitable for Passenger Cars	1.3
<i>1111</i>	3	Suitable for Passenger Cars	2.2
<i>1013</i>	3	Suitable for Passenger Cars	1.7
<i>1019</i>	3	Suitable for Passenger Cars	1.2
<i>1098</i>	3	Suitable for Passenger Cars	1.4

OML level 1 roads are closed all year long. OML level 2 roads are primarily native surfaced roads that are open to the public only from September 1 to December 1 each year. OML 3-5 roads are high standard surfaced roads that are open all year.

Table 3.3 lists the annual and deferred maintenance needs for the OML 3-5 roads within the watershed. Appendix A contains the detailed Road Task Logs for each individual high standard Forest Service system road.

Table 3.3 lists the National Forest high standard system roads located within the watershed annual and deferred maintenance needs.

<i>Route Number</i>	<i>Objective MTC Level - OML</i>	<i>Length Miles</i>	<i>Annual Maintenance Needs</i>	<i>Deferred Maintenance Needs</i>
<i>1001</i>	3	0.4	1,501	11,028
<i>1016</i>	3	2.3	23,895	4,443
<i>1017</i>	3	0.8	12,724	12,656
<i>1111B</i>	3	0.7	6,888	6,328
<i>1111A</i>	3	1.3	13,833	9,492
<i>1111</i>	3	2.2	23,393	8,550
<i>1013</i>	3	1.7	20,525	7,392
<i>1019</i>	3	1.2	19,361	58,494
<i>1098</i>	3	1.4	13,254	658
<i>Subtotal</i>	3	12.0	\$ 135,374	\$ 119,041

### 3.2 Geology

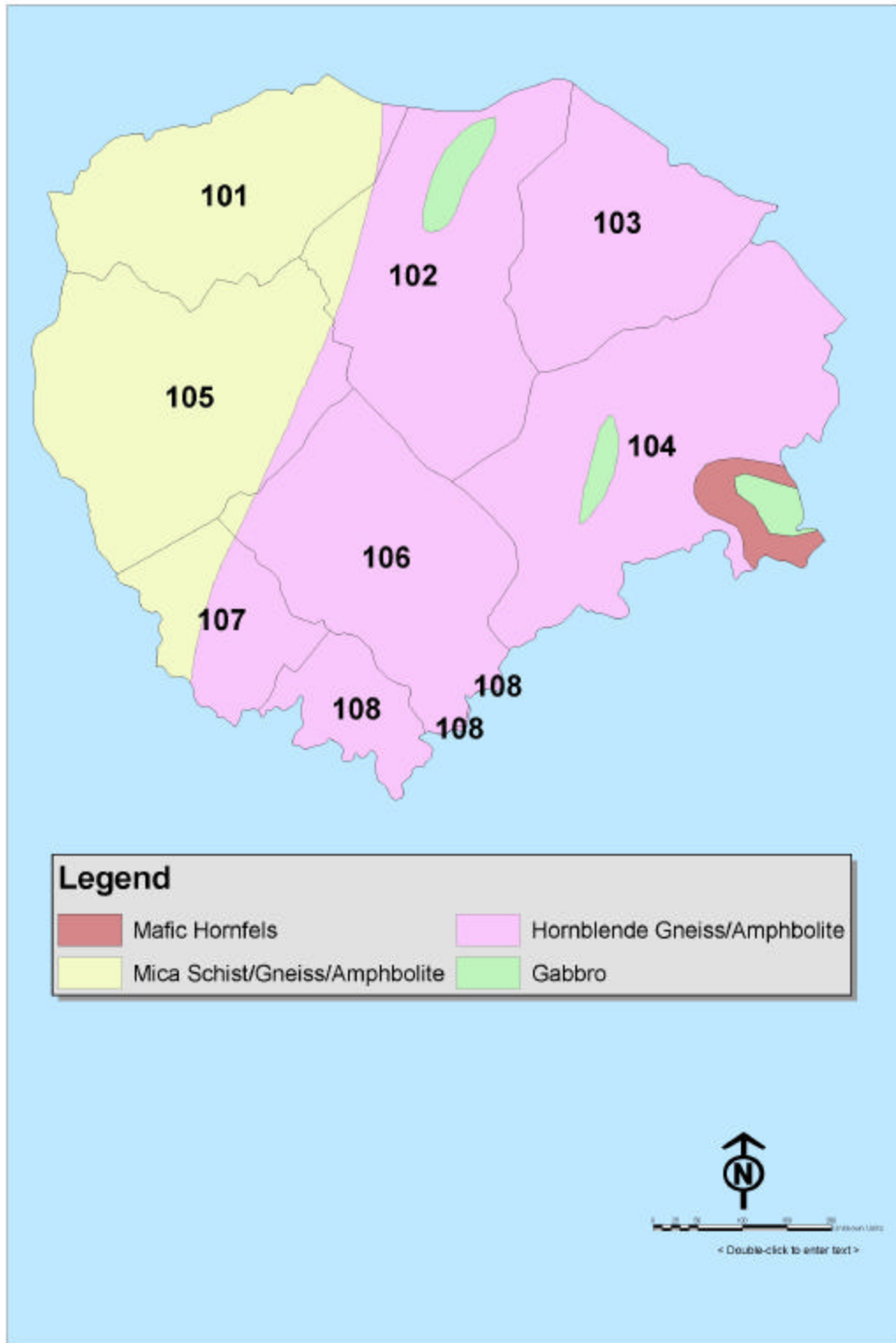
The geology of the watershed where the Forest Service has ownership is displayed in Figure 3.2 and the acres displayed in the following Table.

Table 3.2 – Geologic Rock Types that Compromise the Watershed East of the Ocmulgee River.

<i>Rock Type Description</i>	<i>Acres</i>
<i>Mica Schist/Gneiss/Amphbolite</i>	5,835
<i>Horneblend/Gneiss/Amphbolite</i>	12,213
<i>Gabbro</i>	412
<i>Mafic Hornfels</i>	283
<i>ALL</i>	18,743



# GEOLOGY



### 3.3 Soils/Erosion Processes

The Southern Piedmont extends into many of the southeastern states including Alabama, Georgia, North Carolina, South Carolina, and Virginia covering a total area of approximately 62,330 square miles.

This entire watershed is located within the southern piedmont ecosystem. Elevations within the watershed vary from approximately 400 to 600 feet. The topography is primarily narrow to relatively broad upland ridge tops, short sloping terrain adjacent to major streams, and narrow valley floors that make up 10 percent or less of the land area.

The Southern Piedmont is dominated by Udults soils. The Udults are characterized by having clayey or loamy subsoil, a thermic temperature regime, a udic moisture regime, and kaolinitic, mixed, or oxidized mineralogy. Several soils and soil series comprise the Southern Piedmont (see Table 3.4)

**Table 3.4 – Major Soil Series that Compromise the Southern Piedmont Ecosystem.**

<i>Soil</i>	<i>Soil Series</i>	<i>Description / Comments</i>
<i>Hapludults</i>	Cecil, Madison, Appling	Well drained, very gently sloping to gently sloping.
<i>Paleudults</i>	Davidson	Well drained, steeper slopes
<i>Rhodudults</i>		Well drained, steeper slopes
<i>Dystrochrepts</i>	Chewalca	Alluvial deposits
<i>HapludalFs</i>	Pacolet, Cecil, Gwinnett, Louisa, Louisberg, Wilkes	Well drained, steeper slopes
	Iredell	Old stream terrace – Well drained
	Wickham	Old stream terrace – Well drained
<i>Udifuvents</i>	Congaree, Cartecay	Alluvial deposits
<i>Fluvaquents</i>	Wehadkee	Alluvial deposits
<i>Kanhapludults</i>	Hiwassee	High stream terrace – very well drained

**Table 3.5 Display's the Major Soil Types on NFS Lands within the 6<sup>th</sup> Level HUC.**

<i>Soil Mapunit</i>	<i>Soil Name</i>	<i>Hydro Group</i>	<i>Hi_H20 Table</i>	<i>Drainage</i>	<i>Acres</i>
<b>Bu</b>	Buncombe loamy sand	A	5	1	52
<b>CeB</b>	Cecil sandy loam	B	5	3	236
<b>CeC</b>	Cecil sandy loam	B	5	3	2
<b>CeD</b>	Cecil sandy loam	B	5	3	3
<b>CeE2</b>	Cecil sandy loam, eroded	B	5	3	1
<b>CeF2</b>	Cecil sandy loam, eroded	B	5	3	147
<b>Co</b>	Congaree sandy loam	B	3	4	25
<b>HeB</b>	Hiwassee loam	B	5	3	13
<b>HeC</b>	Hiwassee loam	B	5	3	100
<b>HwD2</b>	Hiwassee clay loam, eroded	B	5	3	119
<b>HwE2</b>	Hiwassee loam eroded	B	5	3	60
<b>IrC</b>	Iredell loam	C	2	4	50
<b>IrD</b>	Iredell loam	C	2	4	38
<b>PaB</b>	Pacolet sandy loam	B	5	3	48
<b>PaC2</b>	Pacolet sandy loam, eroded	B	5	3	19
<b>Pac</b>	Pacolet				229
<b>TC</b>	Toccoa- Cartecay complex	B	3	4	574
<b>WC</b>	Wehadkee & Chewalca	D	1	6	108
<b>WhB</b>	Wickham sandy loam	B	5	3	277
<b>WkC2</b>	Wilkes sandy loam, eroded	C	5	3	35
<b>WkD2</b>	Wilkes sandy loam, eroded	C	5	3	85
<b>WkE3</b>	Wilkes sandy loam, severely eroded	C	5	3	56
<b>999</b>	Unidentified/Unsurveyed				289

### 3.5 Major Forest Communities/Forest Cover

As can be seen in the table below, Forest Cover ranges from 82 to 97 percent within the three main stream reaches covering NFS lands. Forest Cover within the Big Sandy Watershed (5<sup>th</sup> level HUC), Jasper County, and Butts County would all average between 70 and 80 percent forested.

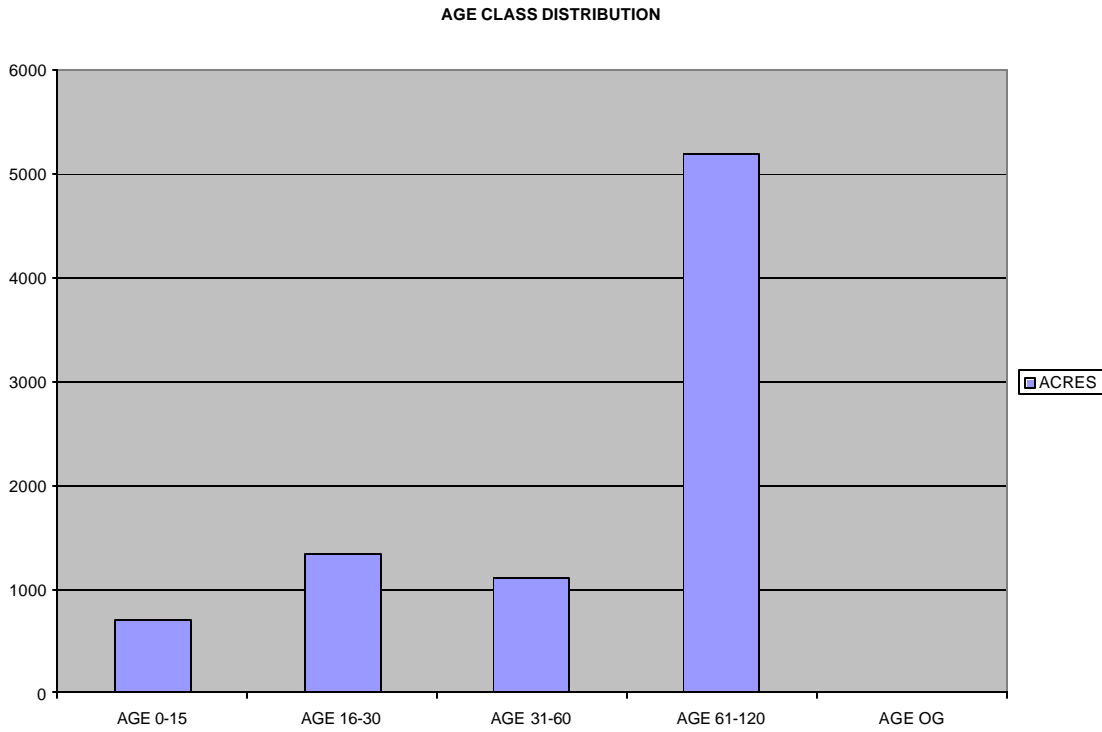
Land Use Category	Kinnard Creek	Wise Creek	Harmon Pye Branch
	Cover	Cover	Cover
	Percent	Percent	Percent
Deciduous Forest	39.97	37.37	45.26
Evergreen Forest	25.81	28.03	28.22
Mixed Forest	16.55	21.59	24.12
Subtotal	82.34	86.99	97.60

The following table lists the Forest Cover Type distribution throughout NFS lands located within the watershed.

**Table 3.6 Display's the Major Forest Types on NFS Lands within the 6<sup>th</sup> Level HUC.**

<i>FRTY Code</i>	<i>Forest Type</i>	<i>Number of Stands</i>	<i>Acres</i>
<b>13</b>	Loblolly Pine - hardwood	1	12
<b>31</b>	Loblolly Pine	174	5,737
<b>47</b>	White Oak-Black Oak-Yellow Pine	2	94
<b>48</b>	N. Red Oak-Hickory-Yellow Pine	1	20
<b>53</b>	White Oak-Red Oak-Hickory	26	1,203
<b>56</b>	Yellow Poplar-White Oak-Red Oak	4	262
<b>58</b>	Sweet Gum-Yellow Poplar	6	623
<b>62</b>	Sweet Gum-Nuttall Oak-Willow	2	100
<b>63</b>	Sugarberry-American Elm-Green Ash	1	31
<b>75</b>	Sycamore-Pecan-American Elm	1	80
<b>99</b>	Non-Forested		203

**Figure 3.3 Display's the Age Class Distribution for all Forest Types on NFS lands.**



**Rare Communities**

Compartment 106 contains a rare habitat (MA 9.F) consisting of a wetland beaver pond complex.

**3.6 Wildlife including PETS and Locally Rare Species**

**Management Indicator Species**

The Oconee National Forest hosts approximately 350 species of wildlife and fish and 1,500 species of plants (USFS, 2001). This great number of species makes it difficult to manage for every species on every acre of the Forest. Therefore, the USFS has identified 15 MIS for the Chattahoochee-Oconee National Forests to represent the many different ecological communities and associated successional stages and species within the Forest. The primary objective with every project is to ensure that viability of any species present is not adversely affected. National Forests use MIS as a tool for identifying specialized habitats and creating habitat objectives and standards and guidelines.

The following is a description of the 11 terrestrial MIS that do occur on the Oconee National Forest and the condition of their existing habitat. These MIS species are indicative of the major forest types in the project area and respond to changes in community diversity, successional diversity, and plant species diversity.

Acadian Flycatcher (*Empidonax virescens*)

The habitat for the Acadian flycatcher consists of deciduous forests near streams with a moderate understory. This bird typically constructs its nest in branches directly overhanging streams. It requires a high dense canopy with an open understory (USFS, 2003b; NatureServe Explorer, 2002). Acadian flycatcher habitat is currently fairly good, with riparian areas common across the forest and in generally good condition (USFS, 2001; 2003b). Population levels have been relatively stable for this species on the Forest, with surveys showing an increasing trend in abundance Statewide during the past 35 years. The quality and integrity of riparian habitat on the Forest is expected to remain constant over time (USFS, 2003b).

Pileated Woodpecker (*Dryocopus pileatus*)

The pileated woodpecker is associated with mature (60+ years) and extensive hardwood and hardwood-pine forest. Deciduous forests are preferred over coniferous forests. The species is found in deep woods, swamps, river bottom forests, and open, upland forest of mixed types. The species bird forages and nests on and in dead trees (snags), with some foraging also occurring on fallen logs and other forest debris (USFS, 2001; 2003b). It prefers woods with a tall, closed canopy and a high basal area (NatureServe Explorer, 2002).

Bird survey data indicate that pileated woodpecker populations have remained relatively stable both on the Forest and throughout the State over the past 10 years. In addition, habitat for the species has been relatively stable over the past 15 years, and is expected to remain stable or increase in the future (USFS, 2003b).

Hooded Warbler (*Wilsonia citrina*)

Hooded warblers are primarily found in mature (although young forests can also be used), mesic deciduous forests with a dense understory and midstory structure. The species nests in the understory of deciduous forests, especially along streams and ravine edges, as well as thickets in riverine forests. A dense shrub layer and scant ground cover are important to the species (NatureServe Explorer, 2002).

Field Sparrow (*Spizella pusilla*)

The field sparrow prefers old fields, brushy hillsides, overgrown and weedy pastures, thorn scrub, deciduous forest edge, untilled and idle cropland, brushy woodlands, sparse second growth, hedgerows, and fencerows. The species nests on or near ground in weed

clumps or grass tufts. Woody vegetation and dense grass appear to be critical components for habitat suitability. Optimal habitat includes dense, moderately tall grass, and low to moderate shrub density (NatureServe Explorer, 2002).

*Prairie Warbler (Dendroica discolor)*

The prairie warbler is an early-successional species that is found in areas with shrubby vegetation, including brushy second growth, dry scrub, low pine-juniper, mangroves, pine barrens, burned-over areas, sproutlands, abandoned fields, powerline corridors, and revegetating strip-mined areas. Breeding habitats for the species are typically suitable beginning about 5 years after burning or clearing, and continuing for about 10 to 20 years. The species typically nests in a shrub, sapling, thicket, or fern clump (NatureServe Explorer, 2002).

*Wood Thrush (Hylocichla mustelina)*

The wood thrush is a forest interior species typically found in mature deciduous or mixed forests with a dense tree canopy and a fairly well-developed deciduous understory. Bottomlands and other rich hardwood forests are optimal habitats. The species is also found in pine forests with a deciduous understory (NatureServe Explorer, 2002).

*Scarlet Tanager (Piranga olivacea)*

The scarlet tanager is an MIS for the upland oak community, and is not very common on the Oconee National Forest (USFS, 2004b). The species is found in deciduous forests and mature deciduous woodlands, including deciduous and mixed swamp and floodplain forests and rich moist upland forests, preferring oak trees. The species nests most commonly in areas with a relatively closed canopy, dense understory with a high diversity of shrubs, and scanty ground cover. The species also sometimes nests in wooded parks and orchards (NatureServe Explorer, 2002).

*Swainson's Warbler (Limnothlypis swainsonii)*

Swainson's warbler is found in early-successional riparian habitats in the Piedmont, and is strongly associated with canebrakes, tangles, and thick shrubby understories of open bottomland hardwoods and mixed forests. The species is found in rich, damp, deciduous floodplain and swamp forests, requiring areas with deep shade from both canopy and understory cover. The species nests in understory canes, shrubs, vine tangles, and similar sites, typically within about 200 meters of open water (NatureServe Explorer, 2002).

*Pine Warbler (Dendroica pinus)*

The pine warbler is associated with pine and pine-oak forests, generally occurring only where some pine component is present. The highest numbers of the species occur where pure stands of pine are found; the species is less abundant as the proportion of hardwood

tree species increases. Optimal nesting habitat for the species is provided by pure, dense, mature pine stands that lack a tall understory (NatureServe Explorer, 2002).

Red-cockaded Woodpecker (*Picoides borealis*)

The red-cockaded woodpecker (RCW), a federally listed endangered species, currently occupies habitat on the south end of the Oconee National Forest and in the Piedmont National Wildlife Refuge, which is just outside of the project area. According to the revised RCW Recovery Plan, the Oconee National Forest and Piedmont National Wildlife Refuge together make up one secondary core recovery population of RCW, referred to as the Piedmont Recovery Unit. The plan defines a secondary core population as “a population identified in recovery criteria that will hold at least 250 potential breeding groups at the time of and after delisting.” In 2000, the Piedmont Recovery Unit had 59 breeding pairs—20 on the Oconee National Forest (including the Hitchiti Experimental Forest) and 39 on the Piedmont National Wildlife Refuge.

Under the direction of the RCW Final EIS and ROD and the ESA, the Oconee National Forest must not jeopardize endangered species and must carry out programs for their conservation (16 U.S.C. 1536 (a)). Therefore, the Oconee National Forest must protect all cavity trees, protect foraging and nesting habitat, and provide future foraging and nesting habitat. The recovery objective is to create and protect enough RCW habitat to support a genetically sustainable population of 250 breeding pairs. There are currently seven inactive clusters and several acres of potential recruitment areas for the RCW on the Oconee National Forest.

The RCW uses open pinewoods, which can be longleaf (*Pinus palustris*), loblolly (*P. taeda*), shortleaf (*P. echinata*), or slash (*P. elliotti*). Habitat is generally of mature trees (80+ years) with little or no midstory (resembling a park-like conditions). RCWs nest and roost each day in cavities they excavate in live pine trees (USFS, 2001; USFWS, 2002).

Of the 26,937 acres of National Forest land within Jasper County, loblolly pine and pine-hardwood areas available for the RCW make up 18,113 acres. The percentage of the 30 to 60 year old stands in the County is 11 percent. The percentage of future foraging and nesting habitat is 41 percent, and RCW habitat that is 60 years old loblolly pine makes up 47 percent (USFS, 2001). Currently, potential foraging habitats within the project area of Jasper County are fragmented and have thick midstory vegetation, which hinders RCW foraging and increases competition from other vertebrates. There is an abundance of overstocked stands of early- to mid-successional stands of pine trees (future foraging and nesting habitat).

White-tailed Deer (*Odocoileus virginianus*)



White-tailed deer are very adaptable and use a variety of habitat types and successional stages to meet their year-round needs. Grassed openings and closed temporary roads, along with regeneration areas, supply the early successional habitats preferred by the species. Foraging habitat is represented in all forest age classes up to 80 years. Availability of browse and escape cover year-round and hard mast during the fall and early winter are key factors for white-tailed deer success. Riparian habitats supply much of the hard and soft mast (USFS, 2001; 2003c).

While there has been a slight decrease in the availability of deer browse on the Forest over the past 10 years due to a decline in early successional habitat, the white-tailed deer is very adaptable. Deer populations are higher on the Oconee (Piedmont) than in the Georgia mountains, with both populations stable to increasing. Since the deer population has been at or above carrying capacity in the Piedmont, State regulations have been liberalized to help reduce population densities to within habitat capability levels (USFS, 2003b).

### **Locally Rare Species**

From a list of 84 plants listed on the Chattahoochee-Oconee National Forest 2002 Locally Rare Species List (USFS, 2002b), the GNHP indicates the Carolina windflower (*Anemone caroliniana*), log fern (*Dryopteris celsa*), and southern twayblade (*Listera australis*) occur in Jasper County. Although the Carolina windflower and log fern are known from the surrounding area, none of these species are known from the project area (GDNR, 2003).

From a list of 23 animal species (not including aquatic animal species) listed on the Chattahoochee-Oconee National Forest 2002 Locally Rare Species List (USFS, 2002b), the GNHP indicates the four-toed salamander (*Hemidactylium scutatum*) occurs in Jasper County. The four-toed salamander has been recorded from the Hillsboro Northwest, Southwest, and Southeast Quarter Quads, all of which contain land within the project area. The four-toed salamander is known to inhabit swamps, boggy streams and ponds, and wet woods (GDNR, 2003).

### **Proposed, Endangered, Threatened, and Sensitive (PETS) Species**

There are 116 species (26 federally listed and 90 sensitive) on the Chattahoochee-Oconee National Forest PETS species list. From this list, potentially affected species were identified by: 1) reviewing their general habitat preferences, 2) consulting records of known locations of PETS species prepared by the GNHP historical records, and 3) consultations with other agencies and universities, as well as reviewing data from Neotropical Migratory Bird (NTMB) Point Samples, GDNR Bald Eagle Flights, Breeding Bird Census Routes, PETS Risk Assessment for the Oconee National Forest, and general observations (Caldwell, 2004). The following 11 terrestrial PETS species are within the range of the Oconee National Forest based on a review of the above sources.

<u>Common Name</u>	<u>Scientific Name</u>	<u>Status</u>
(Plants)		
Relict trillium Endangered	<i>Trillium reliquum</i>	Federally
Oglethorpe oak	<i>Quercus oglethorpensis</i>	Sensitive
Scherwin's false indigo	<i>Amorpha schwerinii</i>	Sensitive
Bay Starvine	<i>Schisandra glabra</i>	Sensitive
(Terrestrial Animals)		
Red-cockaded woodpecker Endangered	<i>Picoides borealis</i>	Federally
Bald eagle (nests) Threatened	<i>Haliaeetus leucocephalus</i>	Federally
Wood stork (foraging habitat) Endangered	<i>Mycteria americana</i>	Federally
Bachman's sparrow	<i>Aimophila aestivalis</i>	Sensitive
Migrant loggerhead shrike	<i>Lanius ludovicianus migrans</i>	Sensitive
(Insects)		
Appalachian snaketail	<i>Ophiogomphus incurvatus</i>	Sensitive
Margarita river skimmer	<i>Macromia margarita</i>	Sensitive

Of these, all but 3 were dropped from further consideration because their range does not extend into the project area or their specific habitat requirements are not found in the areas of proposed activities. A detailed rationale for elimination of these species is presented in the Biological Evaluation (BE) available in Appendix E of this EA (Caldwell, 2004).

#### Oglethorpe Oak

The extent of the area occupied by Oglethorpe oak is known and documented. This species occurs in Compartment 109. The project location is adjacent to the area where Oglethorpe oaks have been identified. This species usually occupies moist, low-lying sites in Iredell soils, which are not usually full pine stands (Caldwell, 2004).

#### Red-cockaded Woodpecker (RCW)

The RCW currently occupies habitat on the south end of the Oconee Ranger District and the Piedmont National Wildlife Refuge within the project area. It is most abundant on the Hitchiti Experimental Forest (15 active cluster sites) and the Piedmont National Wildlife Refuge (39 cluster sites). One active and one inactive cluster are located in

Compartment 114. The areas that have had RCW use or contain recruitment stands are Compartments 107, 113, 115, 117, 118, and 119. These are located along the boundary of the Refuge. This species uses open pinewoods, which can be longleaf, loblolly, shortleaf, or slash. Habitat is generally of mature trees with little or no midstory (resembling a park-like stand). RCWs nest and roost each day in live pine trees. The dead pine trees (snags) created by the SPB infestation are an ephemeral foraging habitat, which will soon disappear. RCW are located adjacent to the project area and protection from further SPB infestation is necessary to provide for future foraging and nesting habitat. Several potential recruitment areas for the RCW exist within the project area (Caldwell, 2004). This species is described in further detail under MIS above.

### *Bachman's Sparrow*

This species is found within open southern pine forests subject to frequent fires. The specific habitat this species prefers is large areas of well-developed bunch grass and herb layer with limited shrub and hardwood midstory. This bird has been detected by Point counts done during the nesting season for Neotropical birds. Bird inventories are done on the forest yearly. Reports from the GDNR and the Piedmont National Wildlife Refuge found several RCW sites in the Refuge with Bachman sparrows present last year. Bachman sparrows have been identified in Compartment 114. Even though this species has not been reported on the Oconee National Forest in the past, it did occur within some stands last year within the RCW areas (Caldwell, 2004).

## **3.7 Lands**

At the present time there are no known trespass cases. Potential conflicts and encroachments from rapidly developing private lands adjacent to NFS lands is a concern.

Lands within the Recommended Scenic River Corridor (1/4 mile adjacent to the Ocmulgee River) and all upland pine or pine/mixed hardwoods that would be suitable RCW habitat are a high priority for acquisition through purchase or exchange.

## **3.8 Special Uses**

The majority of Special Uses are related to various utility corridors. Special Uses related to private access (ANILCA) are relatively few at this time.

## **3.9 Heritage Resources**

A total of 11 different survey projects have been conducted in this area over the past 20 years, recording a total of 168 archaeological sites. These sites represent nearly the entire span of human occupation of the Georgia piedmont, ranging from 9,000 year old Native American campsites to twentieth century American tenant farms. Due to the history of

extensive landscape modification and erosion in this area, most of the archaeological sites in the Kinnard Creek area have been found to be disturbed and are not considered to be eligible for inclusion on the National Register of Historic Places (NRHP). Of the 168 sites recorded in the area, 133 have been determined to be not eligible for the NRHP, while 35 (23 historic sites, 8 prehistoric sites, 4 with both prehistoric and historic occupations) are recommended for further investigations to determine their eligibility. No sites have been found to be significant and recommended as eligible for the NRHP in the Kinnard Creek watershed analysis area. Approximately 8,280 acres of National Forest land have been surveyed to locate heritage sites within the analysis area, leaving -- -- acres yet to surveyed. Overall site density in the analysis area is approximately one site every 49 acres, indicating that approximately -- sites will be recorded by future surveys in the area.

A total of 94 sites contain evidence for occupation by prehistoric Native Americans.<sup>1</sup> All but 12 of these prehistoric sites have been heavily disturbed by historic period erosion and ground disturbing activities. Most of the sites (n=57) cannot be dated, while the remaining 37 can be assigned to at least broad periods of occupation. The earliest evidence for human use of the Kinnard Creek watershed is from the Early Archaic period (11,000-11,500 B.C.) and occupation (or at least the visible remains of that occupation) appears to have been light up until the last 2,000 years. Most of the prehistoric sites in the Kinnard Creek watershed date from the period of roughly A.D. 1 through 1600. This area appears to have been largely abandoned from the Lamar period (A.D. 1600s) until the early nineteenth century.

Evidence for occupation during the historic period can be found at 87 sites within the Kinnard Creek watershed. Roughly half of these (n=43) date to the late nineteenth or early twentieth centuries, and probably represent farmsteads occupied by cotton farmers (either owner/operators or tenants). Only five sites could be assigned to the early or middle nineteenth century. A single cemetery and two still sites also have been recorded in the area. The second most common type of historic site in the analysis area is rock pile features. Nineteen such sites have been recorded within the analysis area. These are typically considered to represent historic period field clearing piles, but a few have been found to represent the remains of prehistoric activity. Of the 27 historic period sites recommended for further investigation to determine eligibility for the NRHP, 11 consist of rock pile sites recommended for further investigations to determine their exact nature. The remaining 16 historic sites recommended for further investigation are late nineteenth to early twentieth century farmsteads.

## 4.0 OPPORTUNITY ANALYSIS RESULTS

### ID TEAM

An interdisciplinary Team comprised of Oconee Ranger District personnel identified opportunities within the watershed by comparing the Forest Plan desired future condition with the existing condition. Those opportunities highlighted in this analysis were constrained by the following managerial sideboards:

- Applicable laws, regulations, and policy requirements that can be determined without collecting additional information or through extensive analysis: For example, highlighting potential opportunities for further analysis consistent with the RCW Recovery Plan.
- Forest Plan Management Area Prescriptions
- Opportunities which have been funded in the past or have some likelihood of being funded in the future.

The purpose of this analysis is to highlight opportunities/projects for funding using appropriated or cooperative funds or partnership opportunities that will implement the Forest Plan. It is not intended that the analysis team spend time and money identifying opportunities for which there is virtually no likelihood of ever funding.

### Recreation

Recreation Re-alignment and Trails Analysis are on-going processes that were considered to a certain extent. At this time we know that the existing CONF trails and developed recreation sites maintenance costs exceed our ability to maintain them to standard.

The existing horse trail system is heavily used and has a large volunteer organization that assists in maintenance. The Kinnard Creek Horse Trail, approximately 5 miles in length, connects to the Ocmulgee River horse trail system (17 miles). Horseback riding is the major developed recreation use, up and down the length of the Ocmulgee River. The following opportunities were identified for Kinnard Creek Horse Trail:

- Improved signage and trail markers \$2,000
- Evaluate stream crossings and existing bridges (Rec & Eng Staff) \$2,500
- Long-term opportunity – Pursue T-21 funds for heavy mtc.  
Plus any stream crossing and bridge improvement needs Identified.

### **Soil and Water**

Gully Erosion - resulting from past cotton farming practices. Multiple opportunities can be brought forward with additional field reconnaissance

Compartment 107, stand 12	\$30,000
Field reconnaissance of other gully restoration Opportunities (soils/hydrologist/engineering)	\$3,000

County Roads where culverts have been non-functional have created several large gully's adjacent to Wise Creek in compartment 107. Opportunities consist of working cooperatively with the County on road maintenance techniques/practices. Filling the heads of the gully's with surge stone to dissipate the water energy would reduce the amount of cutting/sediment that is occurring.

Soil Scientist/Hydrologist/Engineering evaluation and cost estimate. Look for KV, stewardship of NFVW opportunities to fund work once cost is determined	\$3,000
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Table 3.1 shows that roads are a potential source of sediment. Look at Capital Improvement Project (CIP) funds and CMRD appropriated funds to reduce deferred maintenance needs. Utilize purchaser required maintenance (as part of commercial timber sales) to improve drainage, re-shape and maintain existing roads. No specified road decommissioning opportunities were identified as part of this preliminary analysis but continue to look for decommissioning opportunities as part of project specific planning.

### **Invasive/Noxious Weeds**

Early successional habitat consisting of managed wildlife openings (Dan Gun Field s) have autumn olive, kudzu, and mimosa encroaching from adjacent roads. These invasive species could be controlled through herbicide application. The wildlife openings are approximately 25 acres in size, spot treatment would affect roughly 5-10 acres.

Compartment 102 Stand 22 and 27	\$1,500
Include project with vegetation mgm't NEPA analysis	\$0

### **Vegetation Management (RCW Habitat Restoration)**

There is an opportunity to work toward the desired future condition of the Forest as described in the 2004 Chattahoochee-Oconee National Forests Land and Resource Management Plan Revision (LRMP) and its Final Environmental Impact Statement (FEIS) and Record of Decision (ROD). The proposed project (compartments 101 through 108) lies entirely within RCW Sub Habitat Management Area in Jasper County, Georgia. That portion of the Oconee Ranger District located

south of Interstate 20, is part of a secondary recovery population for red-cockaded woodpecker (RCW), *Picoides borealis*. Therefore the 8.D.1 Management Area direction, Sub HMA for the red-cockaded woodpecker is the primary Management Area prescription that must be complied with (LRMP, pg 3-51). In addition, the Ocmulgee River which forms the northwest boundary of the project area is a recommended Scenic River or Management Area 2.B.2. Canebrakes, a rare community type, are unmapped but assigned a Management Area prescription 9.F. The majority of hardwood types (excluding the upland oak woodlands) are located adjacent to streams and major drainages and have a 9.H. Management Area prescription

The LRMP emphasis for each Management Area is as follows:

**2.B.2 – Recommended Scenic River Segments:** These streams and their associated corridors have been recommended for further study of their suitability for Congressional designation as wild, scenic, or recreational river segments as a part of the National Wild and Scenic Rivers System. They are managed to protect and perpetuate the outstandingly remarkable values that qualifies them for further study. The streams would be preserved in a free-flowing condition for the benefit, use and enjoyment of present and future generations (LRMP, pg 3-32 through 3-40).

**8.D.1 – Red-Cockaded Woodpecker Sub Habitat Management Areas:** ...the management emphasis is to provide suitable-to-optimal habitat conditions in areas containing small RCW populations within the larger, designated habitat management area. (8.D). These RCW populations are at the greatest risk of local extirpation and in need of immediate, aggressive management action to create and protect suitable habitat (LRMP, pg 3-138 through 3-144).

**9.F – Rare Communities (Canebrakes):** Canebrakes are important habitats for a number of species, and have declined in extent and quality greatly within historical times. Canebrake restoration efforts will occur on sites currently supporting cane. Management actions will be designed to increase the vigor, density, and area of existing patches of cane (LRMP, pg 3-157 through 3-166).

**9.H – Management, Maintenance, And Restoration Of Plant Associations To Their Ecological Potential:** The purpose of this prescription is the restoration of historical plant associations and their ecological dynamics to ecologically appropriate locations. Focus is on: (1) communities in decline, (2) communities converted from historic composition by land uses, (3) communities on ecologically appropriate sites but unable to maintain themselves, and (4) communities infrequent on national forest but not regionally rare. Suitable-to-optimal habitats to support populations of the plant and animal species associated with these communities will also be maintained (LRMP, pg 3-167 through 3-170).

Implementation of this potential project would serve several purposes:

- Restore foraging and nesting habitat conditions preferred by the red cockaded woodpecker (RCW Recovery Plan)
- Restore rare canbrake communities
- Restore a unique plant association namely the upland oak woodland.
- Improve forest health and vigor of loblolly and mixed pine stands. Thereby potentially reducing:

- | The threat of SPB mortality in key RCW habitat (nesting and foraging).
- | The risk of catastrophic wildfire that could result from extensive SPB mortality.
- | Threats to public health and safety from extensive areas of standing snags.
- | Impacts to recreation and scenery from SPB mortality.
- | Habitat restoration costs associated with SPB mortality.

The watershed analysis specifically identified the following vegetation management opportunities:

- Restore 60 acres of canebrake patches by reducing the overstory shade through girdling. The girdled trees will be left standing in place.
- Restore 209 acres of upland oak woodlands by selectively reducing the overstory basal area to approximately 40 square feet per acre. Secondary treatments will include prescribed burning and spot herbicide application to control undesirable species (if needed).
- Precommercially Thin 492 acres of overstocked loblolly pine plantations to improve forest health and reduce the short-term risk of Southern Pine Beetle (SPB) infestation.
- Intermediate thinning (residual basal area of 60 square feet per acre) of approximately 4,208 acres of loblolly and mixed pine stands to improve forest health, reduce the short-term risk of Southern Pine Beetle (SPB) infestation, and to restore favorable RCW habitat conditions. Secondary treatments include prescribed burning, mechanical and herbicide applications for midstory control in selected stands.
- Regenerate approximately 240 acres. Majority of sites were previously impacted by SPB mortality. Where patches of overstory trees are too dense a shelterwood harvest (residual basal area of 40 square feet) will occur. A combination of artificial and natural regeneration will be utilized. Mechanical site preparation along with hand and herbicide release is proposed in order to insure survival of seedlings. Sites are typically ¼ to 2 acres in size.
- Other associated activities include maintenance of the existing road system; no new system roads will be needed to implement the proposed action. Temporary roads will be utilized to access units and allow landings to be located away from system roads to protect visual quality. Temporary roads will be closed when the project is complete. Secondary activities or improvements not already listed include RCW inserts, soil and water improvements (gully restoration – see previous section ), and spot herbicide treatment of invasive species.

Vegetation implementation costs through Gate 2 are estimated as follows:

Field Reconnaissance Needs:

Silviculture	\$36,000
Archaeologist (Survey 581 acres)	\$15,000
Soil Scientist (Evaluate 300 acres –scattered inclusions Of sensitive soils within activity areas)	\$8,000
Botanical Survey (1,500 acres)	\$18,000
Wildlife Surveys (validate recruitment sites, etc)	\$6,000

NEPA Documentation (SO & District Staff)	\$40,000
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Total Gate 2 cost

\$123,000

The following tables list the specific stands proposed for commercial and pre-commercial thinning and oak woodland restoration opportunities.

**Pre-Commercial Thinning Opportunities in Young Stands for Forest Health**

USTAND	FRTY	STCN	NEWAGE	GIS_AC	ALT2	RX	SURVEY NUMBER	ARCHY NEEDS	RX BURN HERBICIDE	RX BURN X + 1	RX BURN X + 4
<b>COMP 101</b>											
3080101001		31	1	0	26.67	2PCT	88GA08I02				
3080101020		31	13	12	36.52	2PCT	95GA0802				
<b>SUBTOTAL COMPARTMENT 101</b>					<b>63.19</b>			<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>COMP 102</b>											
3080102003		31	1	0	9.93	2PCT	84GA08I01				
3080102005		31	1	0	10.38	2PCT	84GA08I01				
3080102025		31	1	0	30.02	2PCT	88GA08I02				
3080102025		31	1	0	27.06	2PCT	84GA08I01				
3080102034		31	13	15	10.13	2PCT	84GA08I01				
3080102036		31	1	0	7.28	2PCT	84GA08I01				
<b>SUBTOTAL COMPARTMENT 102</b>					<b>94.8</b>			<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>COMP 103</b>											
3080103002		31	1	0	49.37	2PCT	84GA08I01				
3080103008		31	1	0	15.78	2PCT	88GA08I02				
<b>SUBTOTAL COMPARTMENT 103</b>					<b>65.15</b>			<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>COMP 105</b>											
3080105006		31	13	15	56.22	2PCT		56.22			
3080105009		31	13	16	26.36	2PCT		26.36			
3080105012		31	1	0	32.79	2PCT		32.79			
3080105013		31	13	15	53.57	2PCT		53.57			
<b>SUBTOTAL COMPARTMENT 105</b>					<b>168.94</b>			<b>168.94</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>COMP 106</b>											
3080106009		31	13	15	44.98	2PCT	87GA08I01				
3080106017		31	1	0	54.95	2PCT	88GA08I02				
<b>SUBTOTAL COMPARTMENT 106</b>					<b>99.93</b>			<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>SUBTOTAL ALL COMPARTMENTS</b>					<b>492.01</b>			<b>168.94</b>	<b>0</b>	<b>0</b>	<b>0</b>

### Oak Woodland Restoration Opportunities

USTAND	FRTY	STCN	NEWAGE	GIS_AC	ALT2	RX	SURVEY NUMBER	ARCHY NEEDS	RESTORATION HERBICIDE	RX BURN X + 1	RX BURN X + 4
<b>COMP 102</b>											
3080102002	31	1	81	19.01	2	WR40	88GA08I02		19.01	19.01	19.01
3080102024	53	12	81	40.9	2	WR40	84GA08I01		40.9	40.9	40.9
<b>SUBTOTAL COMPARTMENT 102</b>				59.91				0	59.91	59.91	59.91
<b>COMP 104</b>											
3080104021	53	12	90	56.74	2	WR40	88GA08I02		56.74	56.74	56.74
<b>SUBTOTAL COMPARTMENT 104</b>				56.74				0	56.74	56.74	56.74
<b>COMP 105</b>											
3080105020	53	10	75	16.75	2	WR40	84GA08I01		16.75	16.75	16.75
<b>SUBTOTAL COMPARTMENT 105</b>				16.75				0	16.75	16.75	16.75
<b>COMP 106</b>											
3080106018	53	10	91	32.03	2	WR40	87GA08I01		32.03	32.03	32.03
3080106020	53	10	91	22.89	2	WR40	87GA08I01		22.89	22.89	22.89
3080106021	53	10	91	20.93	2	WR40	87GA08I01		20.93	20.93	20.93
<b>SUBTOTAL COMPARTMENT 106</b>				75.85				0	75.85	75.85	75.85
<b>SUBTOTAL ALL COMPARTMENTS</b>				<b>209.25</b>				<b>0</b>	<b>209.25</b>	<b>209.25</b>	<b>209.25</b>

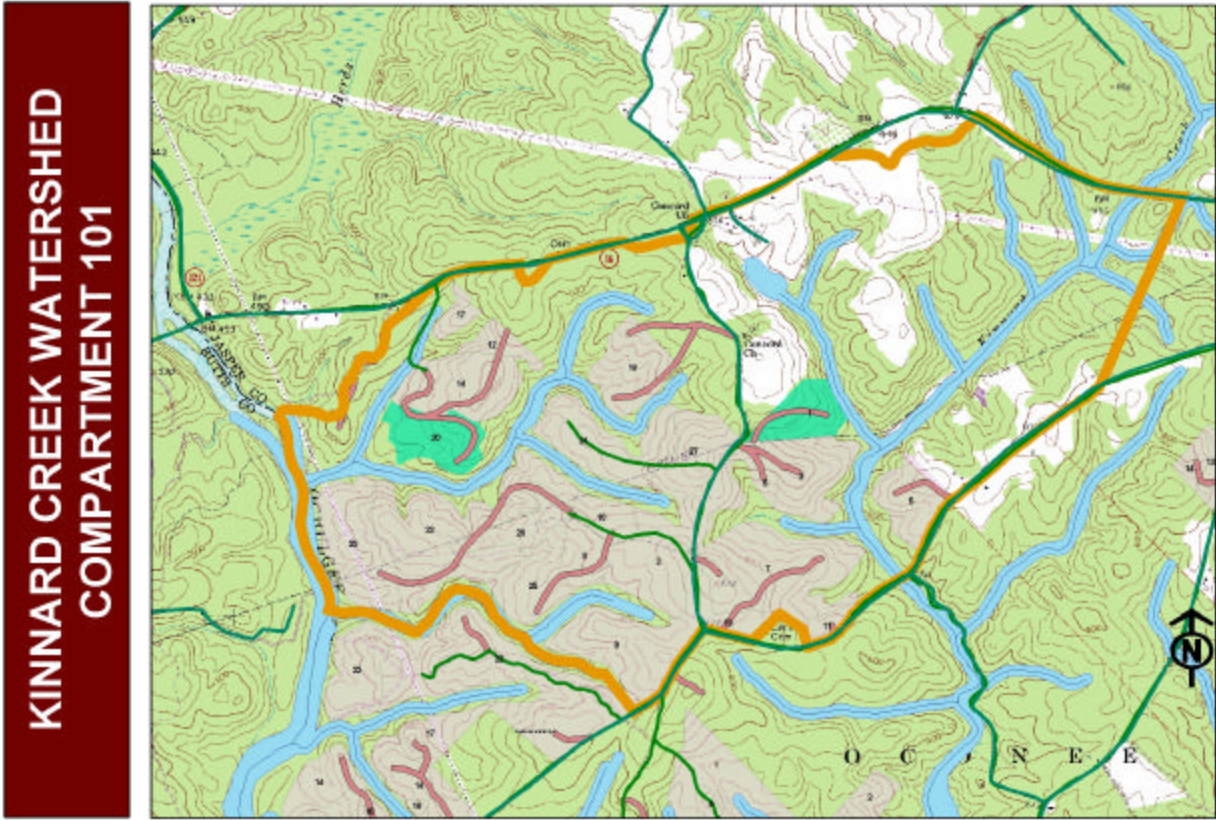
### RCW Foraging and Nesting Habitat Restoration Opportunities

USTAND	FRTY	STCN	NEWAGE	GIS_AC	ALT2	RX	SURVEY NUMBER	ARCHY NEEDS	RCW HERBICIDE	RX BURN X + 1	RX BURN X + 4
<b>COMP 101</b>											
3080101002	31	11	32	54.88		2CT60		54.88		54.88	54.88
3080101003	31	10	84	49.11		2CT60 94GA08-01				49.11	49.11
3080101005	31	12	57	32.75		2CT60 88GA08I02				32.75	32.75
3080101006	31	11	32	5.29		2CT60 94GA08-01				5.29	5.29
3080101007	31	11	32	100.97		2CT60 88GA08I02				100.97	100.97
3080101008	31	10	79	65.1		2CT60 95GA0802				65.1	65.1
3080101009	31	10	76	18.8		2CT60		18.8		18.8	18.8
3080101010	31	10	74	17.54		2CT60		17.54		17.54	17.54
3080101011	31	10	77	9.36		2CT60 88GA08I02				9.36	9.36
3080101012	31	10	77	12.95		2CT60 95GA0802				12.95	12.95
3080101014	31	10	88	50.22		2CT60 95GA0802				50.22	50.22
3080101017	31	10	74	9.45		2CT60 88GA08I02				9.45	9.45
3080101018	31	12	37	39.22		2CT60		39.22		39.22	39.22
3080101019	31	10	76	16.37		2CT60 95GA0802				16.37	16.37
3080101021	31	11	36	52.7		2CT60 94GA0802				52.7	52.7
3080101022	31	11	37	100.01		2CT60 94GA0802				100.01	100.01
3080101022	31	11	37	55.15		9CT60 94GA0802				55.15	55.15
3080101025	31	11	37	34.68		2CT60 94GA0802				34.68	34.68
3080101027	31	12	60	34.96		2CT60 94GA0802				34.96	34.96
3080101028	31	12	59	24.44		2CT60 94GA0802				24.44	24.44
<b>SUBTOTAL COMPARTMENT 101</b>				<b>783.95</b>				<b>130.44</b>	<b>0</b>	<b>783.95</b>	<b>783.95</b>
<b>COMP 102</b>											
3080102001	31	11	32	84.11		8CT60 97GA0806				84.11	84.11
3080102006	31	11	32	25.64		8CT60 97GA0806				25.64	25.64
3080102008	31	12	70	31.27		2CT60 84GA08I01				31.27	31.27
3080102010	31	12	68	19.32		2CT60 84GA08I01				19.32	19.32
3080102012	31	10	76	13.1		2CT60 88GA08I02				13.1	13.1
3080102013	31	12	43	39.27		2CT60 88GA08I02				39.27	39.27
3080102014	31	13	21	11.54		8CT60 88GA08I02				11.54	11.54
3080102015	31	12	70	45.55		2CT60 84GA08I01				45.55	45.55

3080102018	31	10	71	14.55	2CT60 84GA08I01	14.55	14.55
3080102019	31	10	72	6.54	2CT60 84GA08I01	6.54	6.54
3080102022	31	12	71	11.89	2CT60 84GA08I01	11.89	11.89
3080102023	31	10	75	29.12	2CT60 84GA08I01	29.12	29.12
3080102026	31	13	21	15.68	8CT60 84GA08I01	15.68	15.68
3080102027	31	13	21	40.9	8CT60 84GA08I01	40.9	40.9
3080102032	31	11	32	18.34	8CT60 88GA08I02	18.34	18.34
3080102032	31	11	32	9.53	8CT60 97GA08O6	9.53	9.53
<b>SUBTOTAL COMPARTMENT 102</b>			<b>416.35</b>	<b>0</b>	<b>0</b>	<b>416.35</b>	<b>416.35</b>
<b>COMP 103</b>							
3080103004	31	12	66	68.71	2CT60 84GA08I01	68.71	68.71
3080103007	31	12	70	53.12	2CT60 84GA08I01	53.12	53.12
3080103010	31	10	87	59.31	2CT60 84GA08I01	59.31	59.31
3080103011	31	11	36	56.91	8CT60 84GA08I01	56.91	56.91
3080103017	31	13	25	5.18	2CT60 88GA08I02	5.18	5.18
3080103019	31	13	19	11.35	2CT60 84GA08I01	11.35	11.35
3080103021	31	10	76	15.21	2CT60 84GA08I01	15.21	15.21
3080103022	31	10	102	5.75	2CT60 84GA08I01	5.75	5.75
3080103022	31	10	102	41.22	2CT60 84GA08I01	41.22	41.22
3080103022	31	10	102	2.58	2CT60 84GA08I01	2.58	2.58
3080103023	31	10	81	41.52	2CT60 84GA08I01	41.52	41.52
3080103058	31	10	87	10.59	2CT60 84GA08I01	10.59	10.59
3080103059	31	10	102	9.99	2CT60 84GA08I01	9.99	9.99
<b>SUBTOTAL COMPARTMENT 103</b>			<b>381.44</b>	<b>0</b>	<b>0</b>	<b>381.44</b>	<b>381.44</b>
<b>COMP 104</b>							
3080104001	31	13	29	45.64	8CT60 98GA08I19	45.64	45.64
3080104003	31	11	40	17.54	2CT60 88GA08I02	17.54	17.54
3080104003	31	11	40	14.47	2CT60 88GA08I02	14.47	14.47
3080104004	31	10	70	15.1	2CT60 88GA08I02	15.1	15.1
3080104006	31	12	66	59.99	2CT60 88GA08I02	59.99	59.99
3080104007	31	10	86	16.23	2CT60 88GA08I02	16.23	16.23
3080104009	31	13	29	29.11	8CT60 98GA08I19	29.11	29.11
3080104010	31	13	18	20.62	2CT60 88GA08I02	20.62	20.62
3080104010	31	13	18	3.53	2CT60 88GA08I02	3.53	3.53
3080104011	31	10	81	49.14	2CT60 88GA08I02	49.14	49.14
3080104012	31	10	81	138.56	2CT60 98GA08I19	138.56	138.56

3080104015	31	13	22	87.57	2CT60 88GA08I02		87.57	87.57	
3080104015	31	13	22	8.49	2CT60 88GA08I02		8.49	8.49	
3080104017	31	10	75	36.17	2CT60 88GA08I02		36.17	36.17	
3080104018	31	13	22	34.31	2CT60 88GA08I02		34.31	34.31	
3080104018	31	13	22	6	2CT60 84GA08I01		6	6	
3080104020	31	10	80	40.37	2CT60 84GA08I01		40.37	40.37	
3080104022	31	13	22	13.5	8CT60 88GA08I02		13.5	13.5	
3080104024	31	13	29	21.39	8CT60 98GA08I19		21.39	21.39	
3080104026	31	12	71	58.39	2CT60 88GA08I02		58.39	58.39	
3080104028	31	12	63	33.48	2CT60 88GA08I02		33.48	33.48	
3080104029	31	10	83	16.02	2CT60 84GA08I01		16.02	16.02	
3080104030	31	12	68	20.25	2CT60 88GA08I02		20.25	20.25	
3080104031	31	12	59	46.53	2CT60 88GA08I02		46.53	46.53	
3080104032	31	10	75	15.17	2CT60 88GA08I02		15.17	15.17	
3080104041	31	13	29	8.48	8CT60 98GA08I19		8.48	8.48	
3080104042	31	12	65	27.46	2CT60 88GA08I02		27.46	27.46	
3080104043	31	12	77	39.52	2CT60 92GA08-01		39.52	39.52	
3080104044	31	10	83	11.95	2CT60 92GA08-01		11.95	11.95	
3080104057	31	12	63	3.64	2CT60 88GA08I02		3.64	3.64	
<b>SUBTOTAL COMPARTMENT 104</b>				<b>938.62</b>		<b>0</b>	<b>0</b>	<b>938.62</b>	<b>938.62</b>
<b>COMP 105</b>									
3080105001	31	10	73	81.07	2CT60 88GA08I02		81.07	81.07	81.07
3080105002	31	11	26	24.64	2CT60 88GA08I02		24.64	24.64	24.64
3080105004	31	11	26	53.61	8CT60 84GA08I01		53.61	53.61	53.61
3080105005	31	10	85	72.23	2CT60	72.23	72.23	72.23	72.23
3080105007	31	10	86	20.72	2CT60 88GA08I02		20.72	20.72	20.72
3080105010	31	10	76	33.47	2CT60	33.47	33.47	33.47	33.47
3080105011	31	11	26	18.31	8CT60 88GA08I02		18.31	18.31	18.31
3080105014	31	10	81	119.21	2CT60 87GA08I01		119.21	119.21	119.21
3080105014	31	10	81	29.75	9CT60	29.75	29.75	29.75	29.75
3080105015	31	11	26	22.3	2CT60 87GA08I01		22.3	22.3	22.3
3080105016	31	11	26	2.14	2CT60 87GA08I01		2.14	2.14	2.14
3080105016	31	11	26	7.44	2CT60 87GA08I01		7.44	7.44	7.44
3080105017	31	11	26	20.84	2CT60 94GA08-01		20.84	20.84	20.84
3080105021	31	10	76	15.48	2CT60	15.48	15.48	15.48	15.48
3080105022	31	11	43	122.22	2CT60 94GA08-01		122.22	122.22	122.22

3080105022	31	11	43	36.15	9CT60 94GA08-01		36.15	36.15	36.15
<b>SUBTOTAL COMPARTMENT 105</b>				679.58		150.93	612.96	679.58	679.58
<b>COMP 106</b>									
3080106003	31	10	86	29.3	2CT60 87GA08I01			29.3	29.3
3080106004	31	13	24	14.27	8CT60 87GA08I01		14.27	14.27	14.27
3080106005	31	13	25	23.31	8CT60 87GA08I01			23.31	23.31
3080106008	31	10	86	94.75	2CT60 87GA08I01			94.75	94.75
3080106010	31	12	68	40	2CT60 87GA08I01		40	40	40
3080106011	31	10	76	23.4	2CT60 87GA08I01			23.4	23.4
3080106012	31	12	61	51.36	2CT60 88GA08I02		51.36	51.36	51.36
3080106014	31	10	76	128.26	2CT60 87GA08I01		128.26	128.26	128.26
3080106022	31	12	61	25.14	2CT60 87GA08I01		25.14	25.14	25.14
3080106023	31	10	87	9.69	2CT60 87GA08I01			9.69	9.69
3080106024	31	12	43	16.15	2CT60 87GA08I01			16.15	16.15
3080106025	31	12	61	16.97	2CT60 87GA08I01		16.97	16.97	16.97
3080106026	31	10	76	17.7	2CT60 87GA08I01		17.7	17.7	17.7
3080106027	31	12	68	40.09	2CT60 87GA08I01		40.09	40.09	40.09
<b>SUBTOTAL COMPARTMENT 106</b>				530.39		0	333.79	530.39	530.39
<b>COMP 107</b>									
3080107009	31	12	90	8.06	2CT60 87GA08I01		8.06	8.06	8.06
3080107010	31	13	23	75.55	8CT60 87GA08I01		75.55	75.55	75.55
3080107012	31	12	80	96.02	2CT60 87GA08I01		96.02	96.02	96.02
3080107015	31	13	24	81.12	8CT60	81.12	81.12	81.12	81.12
3080107016	31	12	85	49.81	2CT60	49.81	49.81	49.81	49.81
3080107017	31	12	85	37.31	2CT60 87GA08I01		37.31	37.31	37.31
3080107018	31	12	90	5.66	9CT60 87GA08I01		5.66	5.66	5.66
<b>SUBTOTAL COMPARTMENT 107</b>				353.53		130.93	353.53	353.53	353.53
<b>COMP 108</b>									
3080108020	31	12	69	3.19	2CT60 89GA08I02		3.19	3.19	3.19
3080108021	31	10	75	26.79	2CT60 88GA08I02		26.79	26.79	26.79
3080108022	31	10	71	28.29	2CT60 88GA08I02		28.29	28.29	28.29
3080108023	31	10	74	14.99	2CT60 88GA08I02		14.99	14.99	14.99
3080108025	31	13	22	50.53	8CT60 99GA0803		50.53	50.53	50.53
<b>SUBTOTAL COMPARTMENT 108</b>				123.79		0	123.79	123.79	123.79
<b>SUBTOTAL ALL COMPARTMENTS</b>				4207.65		412.3	1424.07	4207.65	4207.65

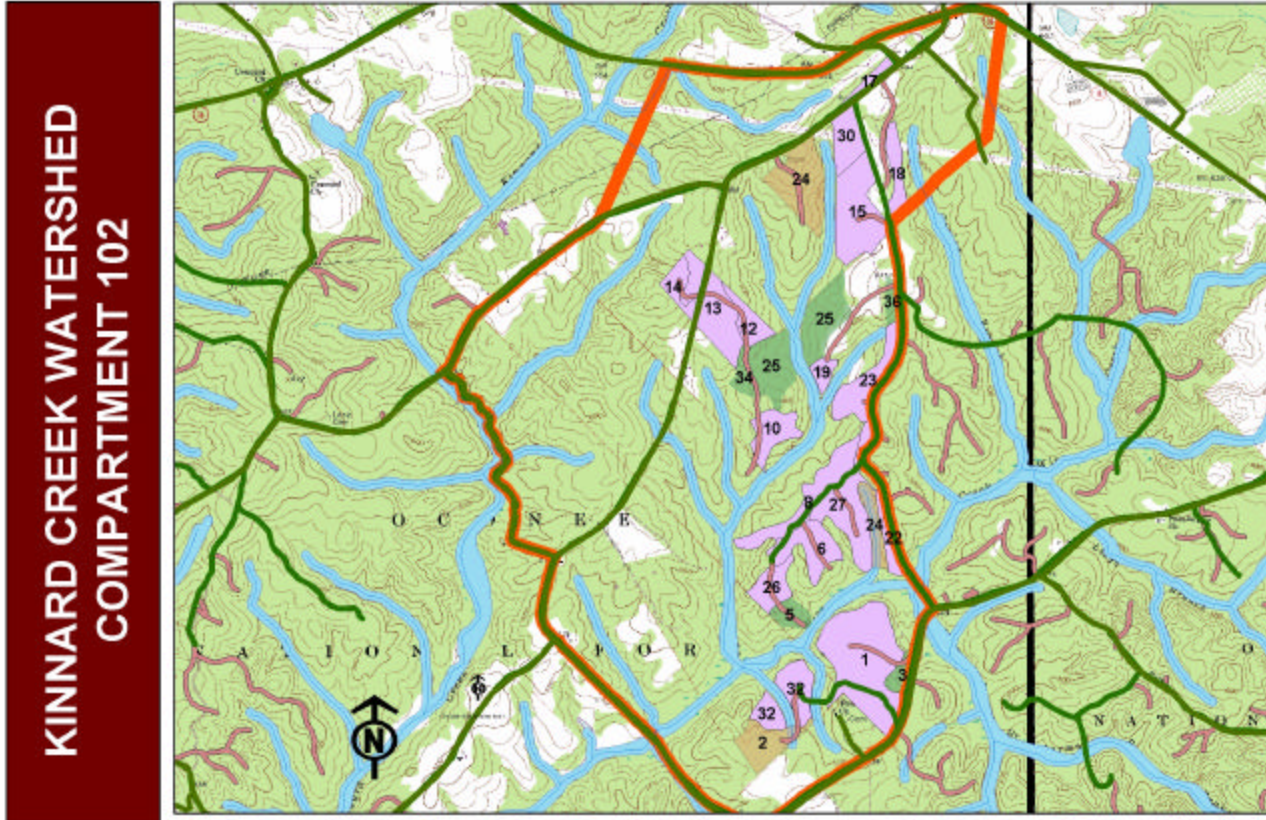


**KINNARD CREEK WATERSHED  
COMPARTMENT 101**

**Legend**

- road\_dlg100k arc
- sandy\_stream2 arc
- temp\_rd\_buf2 polygon
- alt2\_pct polygon
- comp101 polygon
- usfssandy arc
- str\_union2 polygon
- alt2\_ct60 polygon

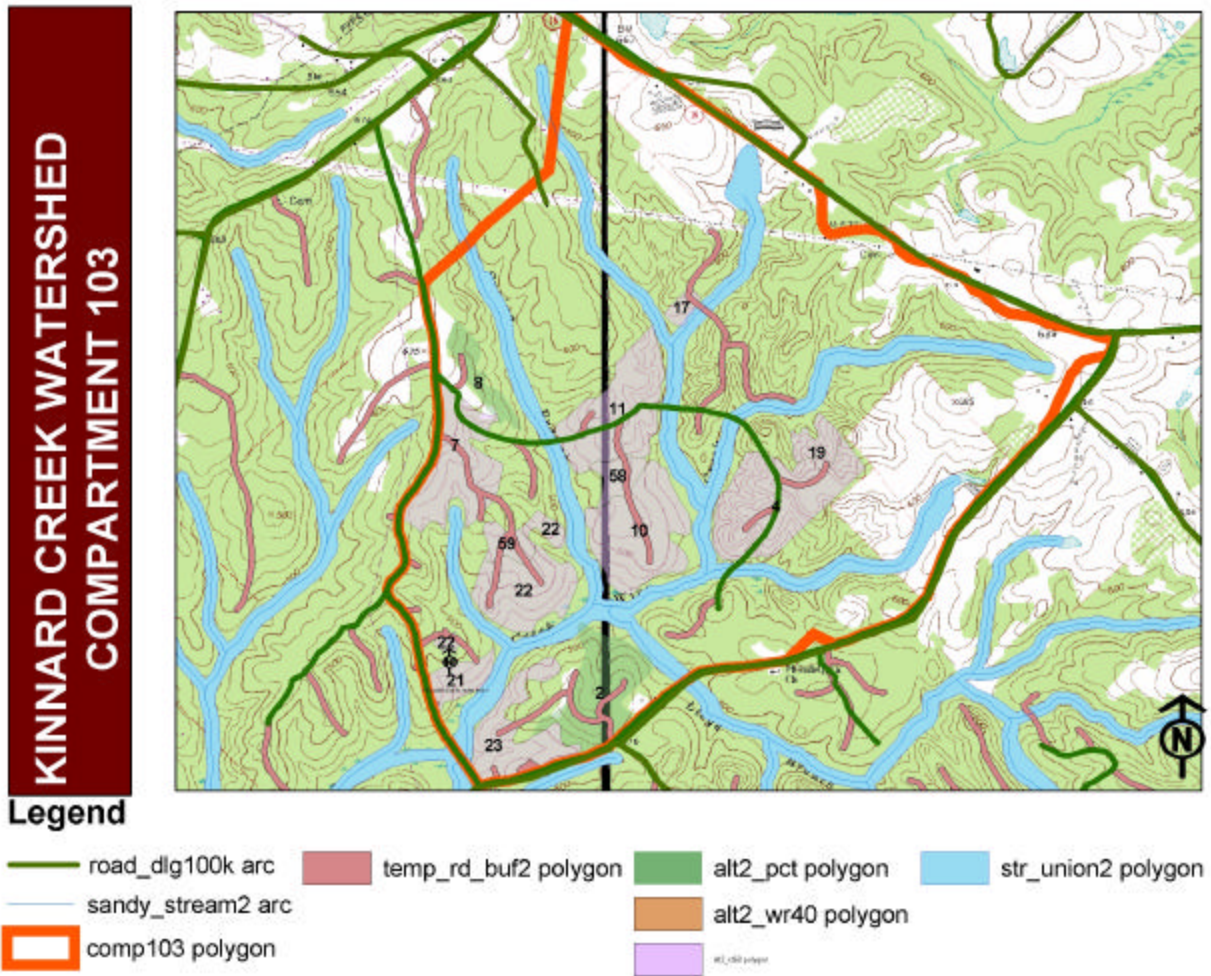


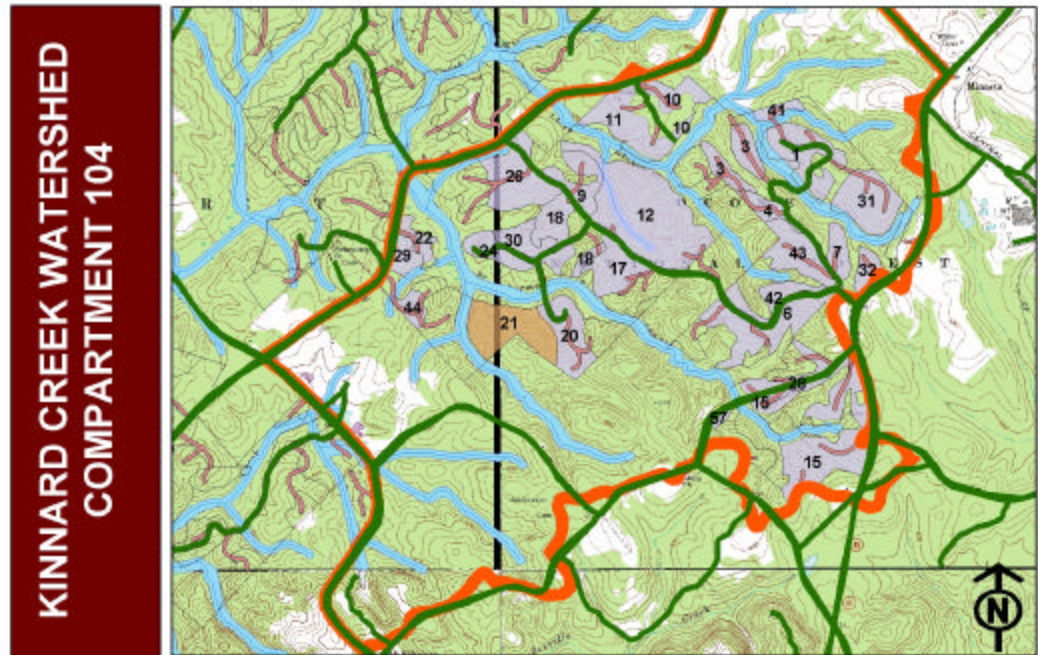


**KINNARD CREEK WATERSHED  
COMPARTMENT 102**

**Legend**

- road\_dlg100k arc
- comp102
- temp\_rd\_buf2
- alt2\_wr40
- str\_union2
- alt2\_ct60
- alt2\_pct

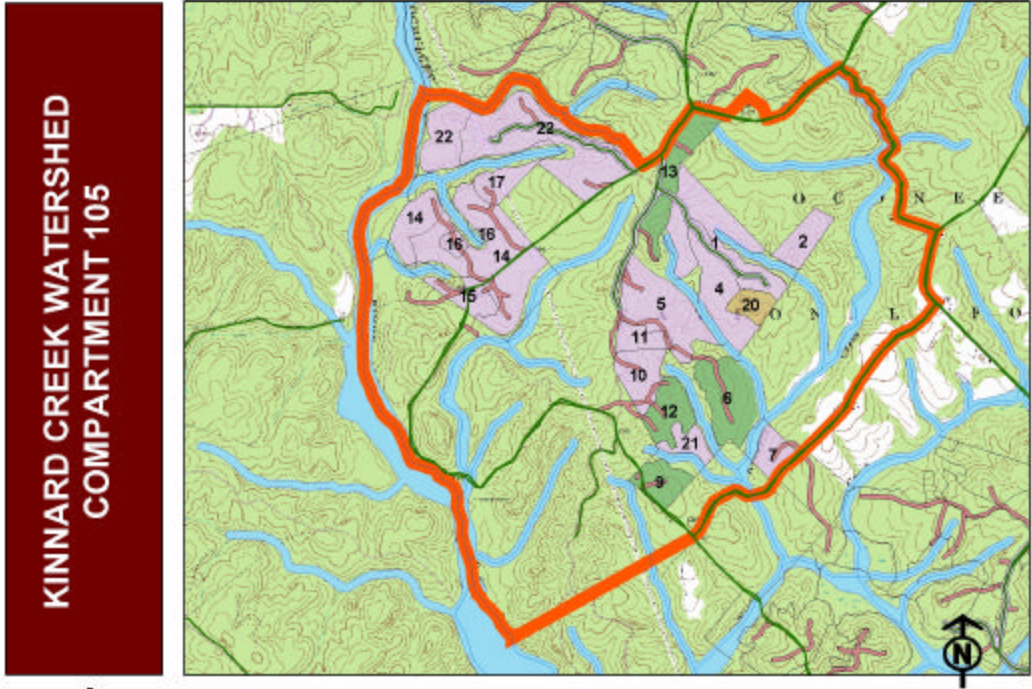




**KINNARD CREEK WATERSHED  
COMPARTMENT 104**

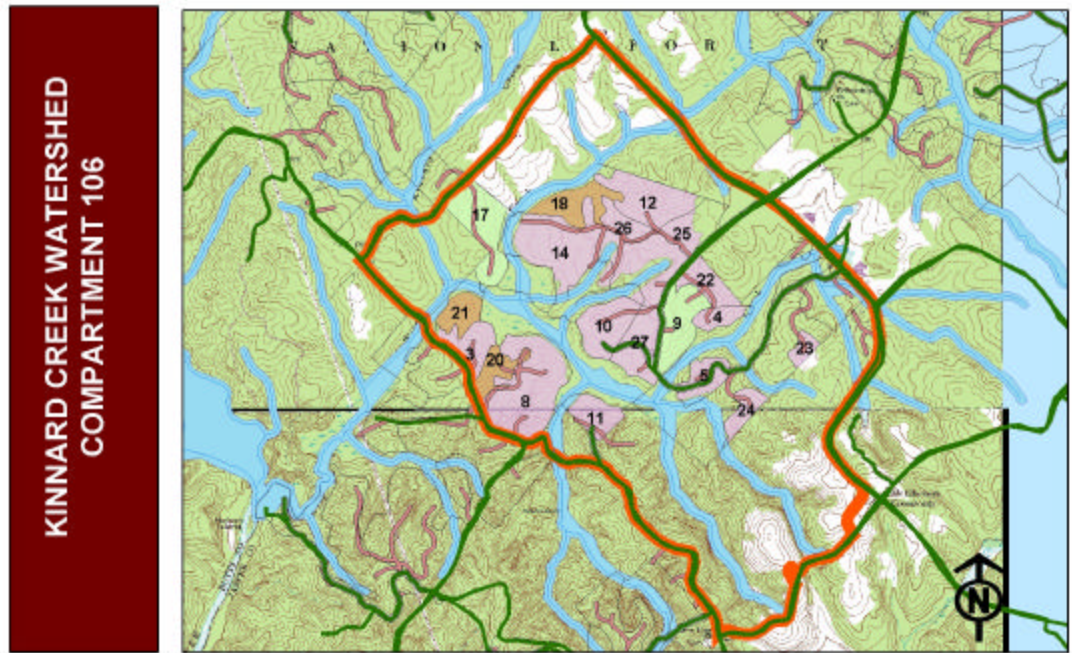
**Legend**

- road\_dlg100k arc
- sandy\_stream2 arc
- comp104 polygon
- temp\_rd\_buf2
- alt2\_pct
- alt2\_ct60
- str\_union2
- alt2\_wr40



**Legend**

- road\_dlg100k arc
- veg\_sandy
- temp\_rd\_buf2
- alt2\_pct
- str\_union2
- comp105
- alt2\_pct
- alt2\_ct60



**Legend**

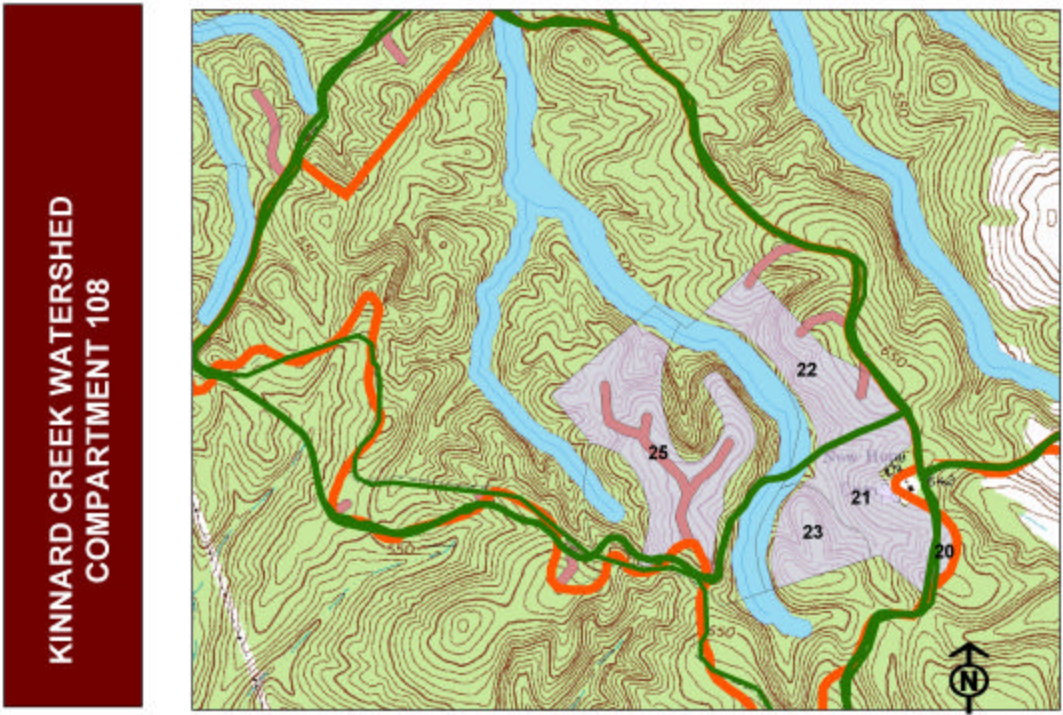
- road\_dlg100k arc
- usfsrds\_75buf polygon
- temp\_rd\_buf2 polygon
- str\_union2 polygon
- comp106 polygon
- veg\_sandy polygon
- alt2\_ct60 polygon
- alt2\_pct polygon
- alt2\_wr40 polygon

**KINNARD CREEK WATERSHED  
COMPARTMENT 107**



**Legend**

- road\_dlg100k arc
- temp\_rd\_buf2 polygon
- alt2\_ct60 polygon
- alt2\_pct polygon
- alt2\_wr40 polygon
- veg\_sandy polygon
- str\_union2 polygon
- comp107 polygon



### Legend

- road\_dlg100k arc
- comp108 polygon
- veg\_sandy polygon
- temp\_rd
- alt2\_ct60
- alt2\_pct
- alt2\_wr40

## **5.0 OPPORTUNITY ANALYSIS TO NEPA**

Watershed analysis is designed to compare existing conditions with the desired future condition specified in the Forest Plan. It is an opportunity analysis designed to highlight potential management options that the Agency may or may not pursue depending upon a variety factors.

The opportunities highlighted in this analysis may not be implemented without full public involvement, NEPA analysis and disclosure. Some opportunities which form unconnected actions may be analyzed separately, such as trail maintenance. Connected actions will be analyzed in the same NEPA analysis document.

### **Transition to NEPA**

The following steps remain to be undertaken leading to a completed NEPA analysis and decision document(s).

- Internal Review of proposed action(s) by Supervisors Office
- Collaboration with partner Agencies (GFC, GDNR, USFW, etc) to review and refine proposed action(s). This step is optional but collaboration is highly desirable for exploring partnership opportunities.
- Initiate NEPA scoping and analysis consistent with CEQ, 36 CFR 215 & FSH 1909.15 requirements.