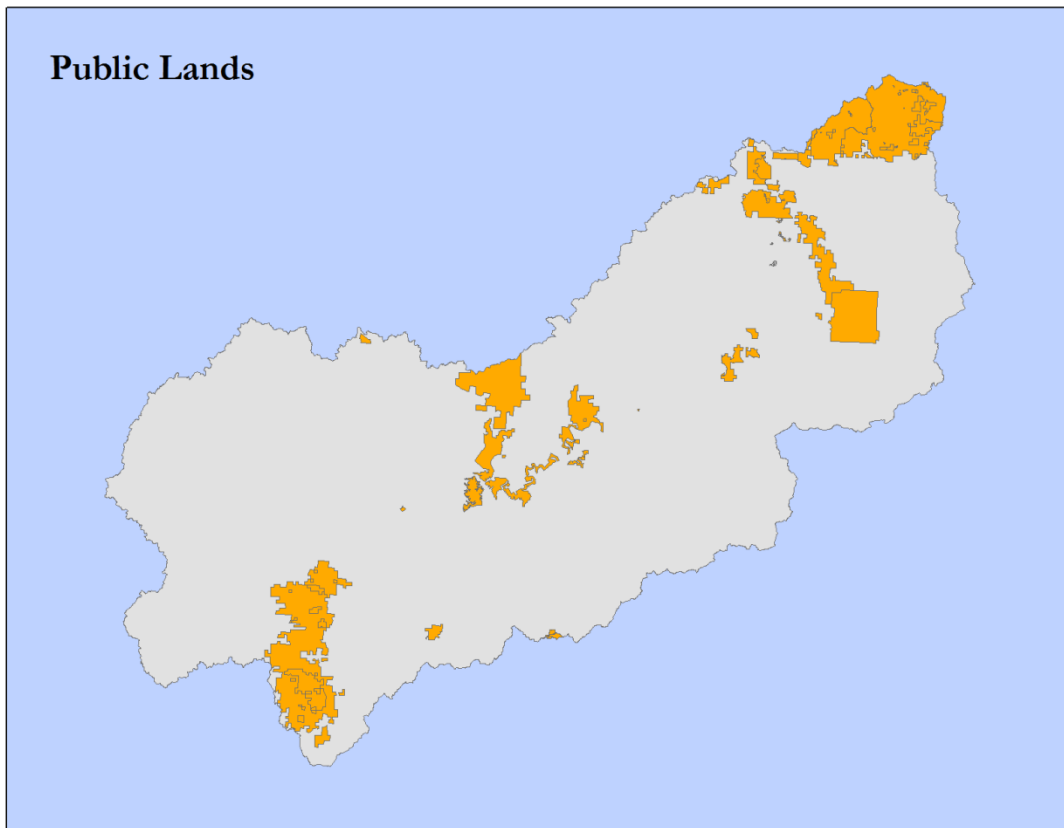


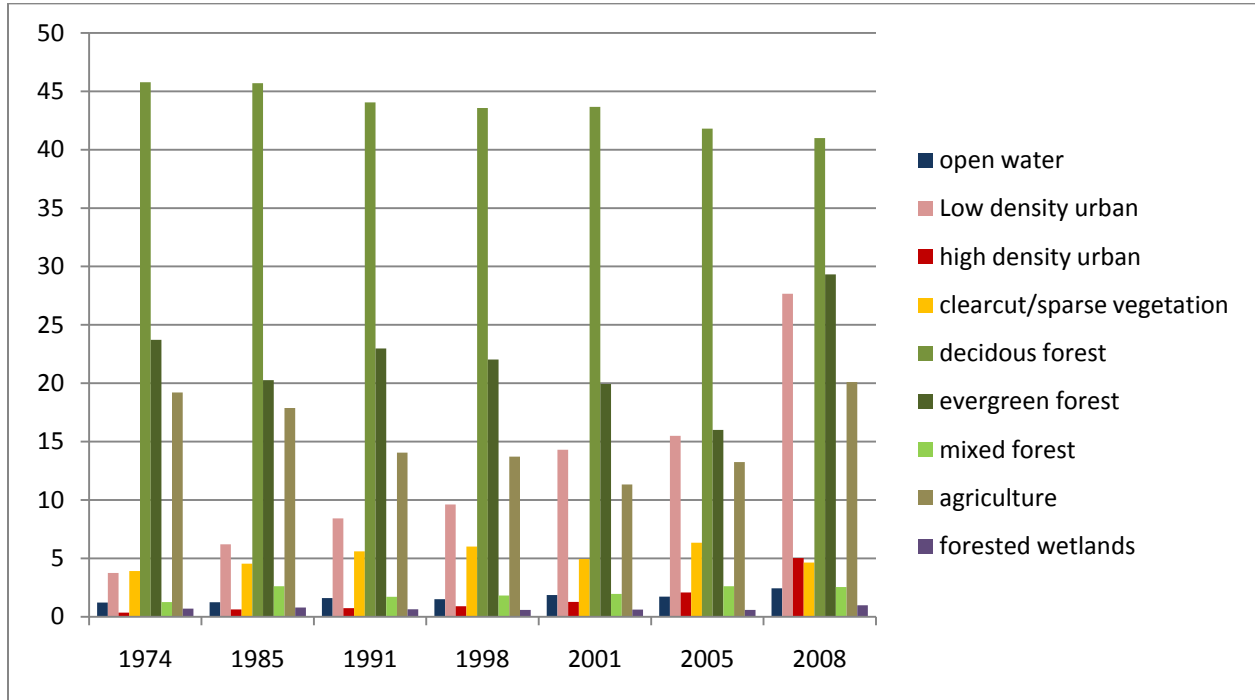
## A resource assessment of the Etowah Watershed

The Upper Etowah watershed drains a region dominated by rolling Piedmont topography with interspersed forest cover, agricultural and urban land uses. With the exception of protected National Forest and state lands in the uppermost Blue Ridge headwater areas, the watershed is a patchwork of private lands that “produce” water. Degradation of this important surface water resource is evident by excessive nutrients transported from non-point sources originating on private lands into Lake Allatoona, a U.S. Army Corps of Engineers (USACOE) reservoir that impounds the Etowah River below Canton. The Georgia Environmental Protection Division (GAEPD) has issued a draft nutrient TMDL for Lake Allatoona and has listed 125 stream miles in the watershed above Canton that not meeting beneficial uses, due to nonpoint source pollutions.

The Etowah River watershed in Georgia is a headwater area which yields water supplies for greater than 600,000 consumers within the watershed, and which has increasing significance for regional water supply. The watershed is the dominant source for water supply to populations served by utilities in the northwestern portion of the Atlanta metropolitan area. The majority of the area is in private land ownership. Public lands include Chattahoochee National Forest, Dawson forest, Paulding Forest and a number of DNR managed Wildlife Management Areas. The figure below depicts the distribution of public lands throughout the watershed.

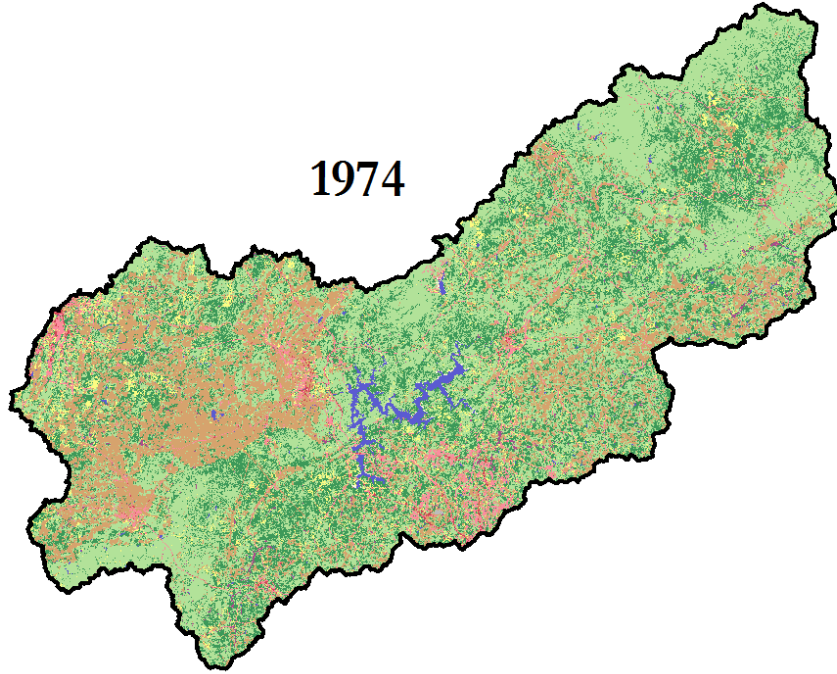















The watershed is experiencing rapid development that is reflected in the land cover data. The bars represent the percent of the area in each land cover category for each year. Notice the steady decrease in deciduous forest and the steady and rapid increase in low density urban land uses. Low density urban went from 45 of the area in 1974 to 28% of the area in 2008.

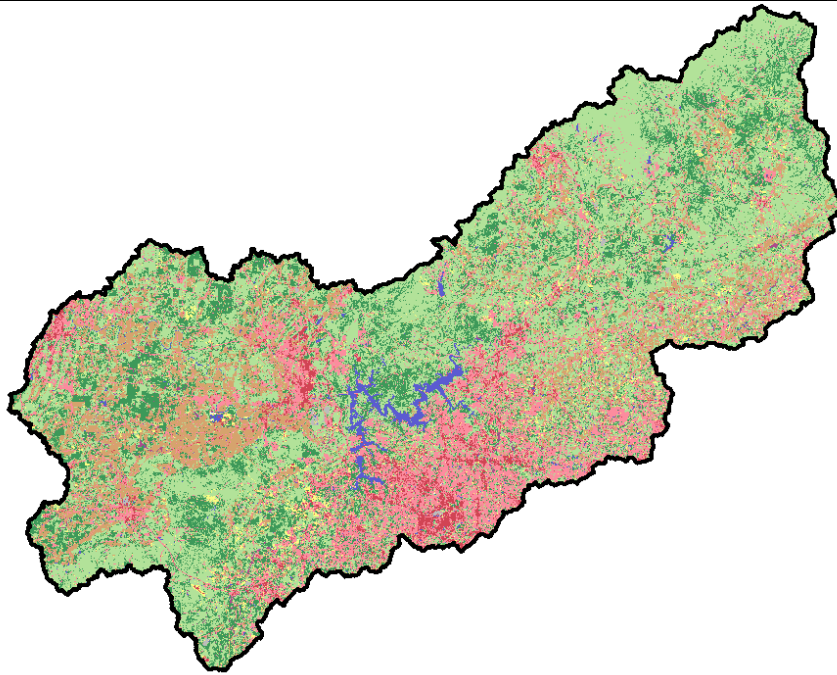


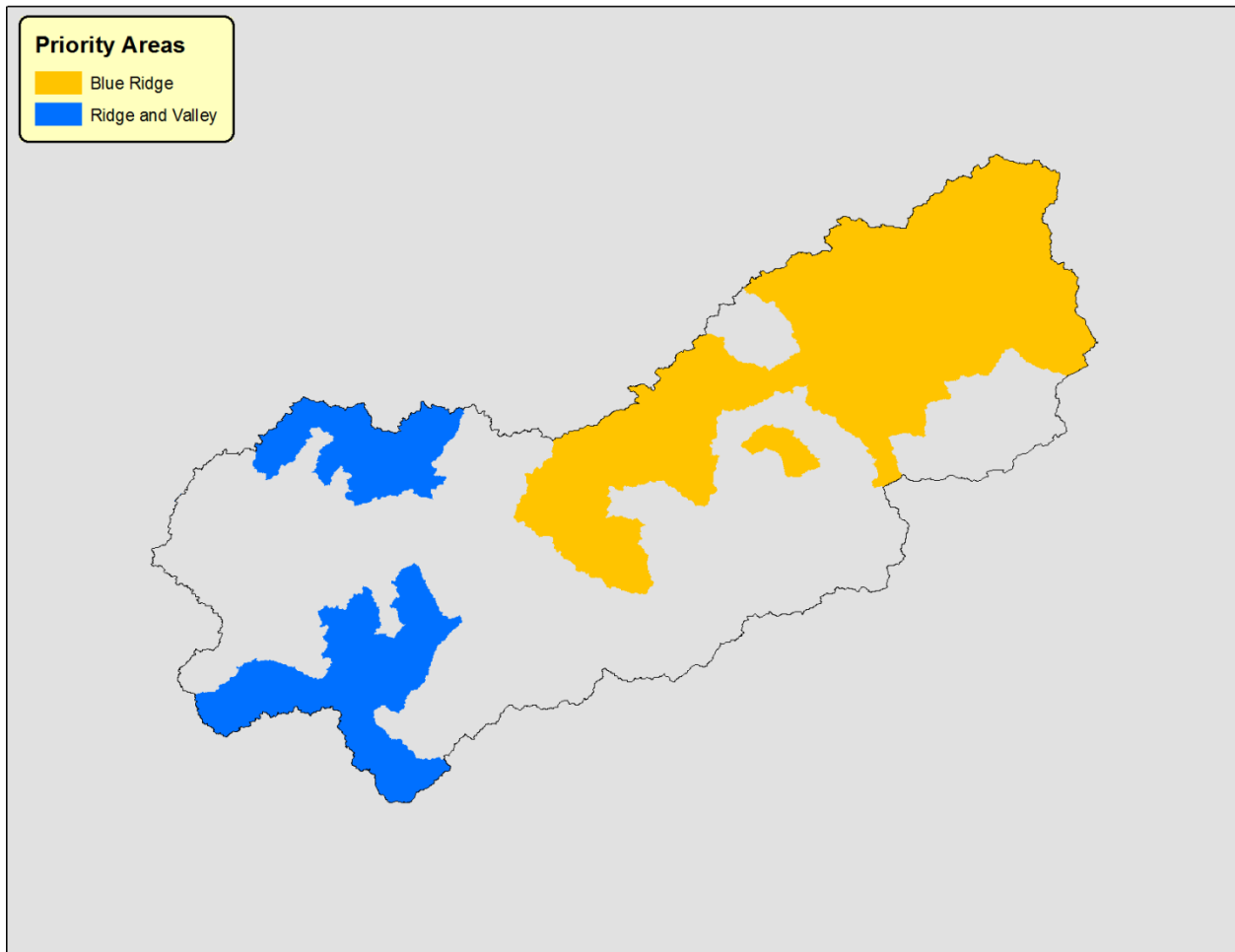
The map below shows the changes in land cover between 1974 and 2008. Most of the change has occurred in the lower part of the Etowah watershed and around Lake Allatoona. Much of the area that was previously agriculture has been replaced by low density urban (residential) development.

1974



Land Cover Classes					
	Beach/Sand/Mud		Mine/Outcrops/Quarries		Forested Wetlands
	Open Water		Deciduous Forests		Brackish Wetlands
	Low Intensity Urban		Evergreen Forests		Freshwater Wetlands
	High Intensity Urban		Mixed Forest		
	Clearcut/Sparse Vegetation		Agriculture		



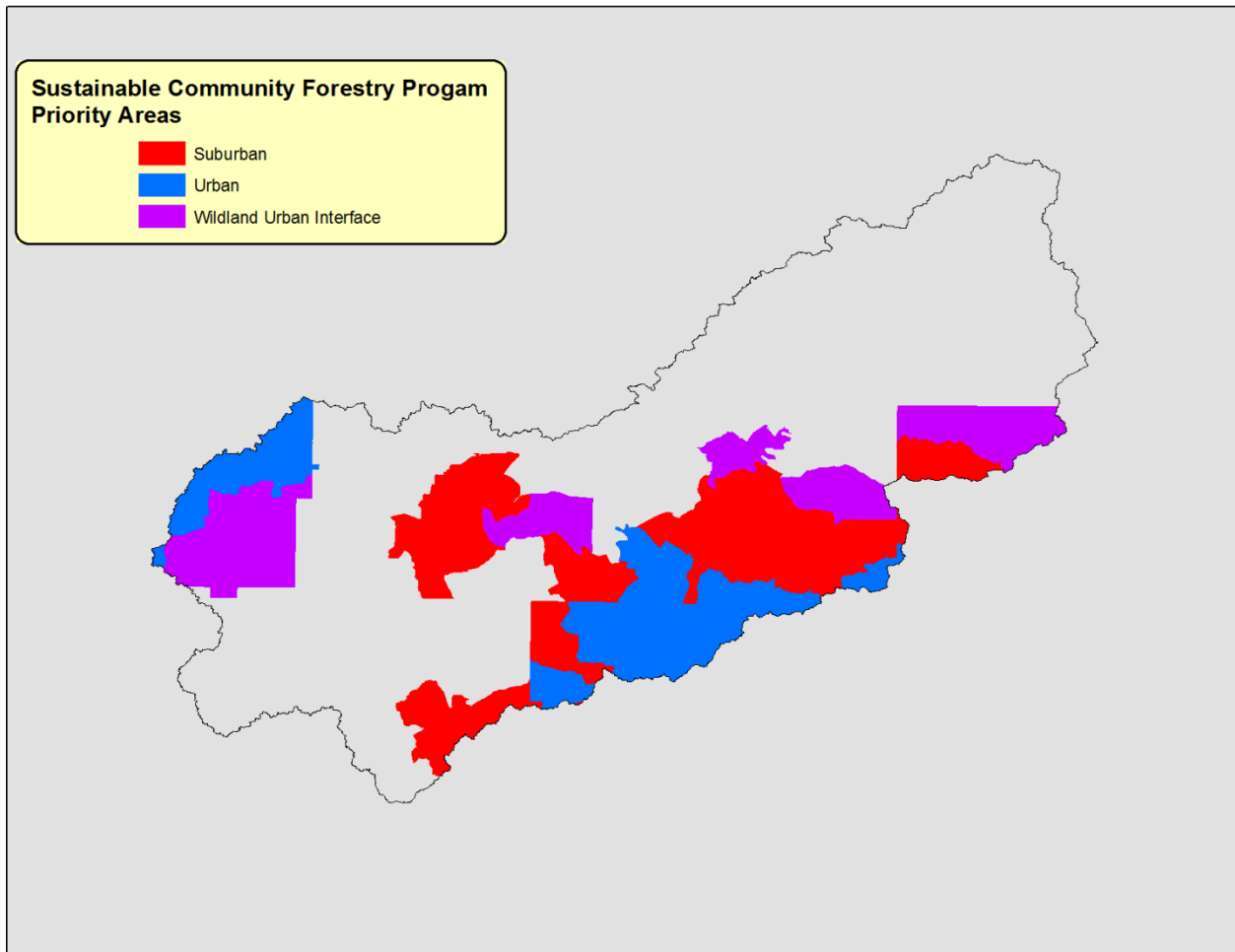


The map above illustrates the location of the forest resource priority areas found in the Etowah watershed. These areas represent areas which are still at least 30% forested. Two of the priority areas are represented in the watershed the Blue Ridge and the Ridge and Valley ecoregions. Large tracts of the priority area in the Blue Ridge is owned and managed by the US Forest Service or Georgia Department of Natural Resources.

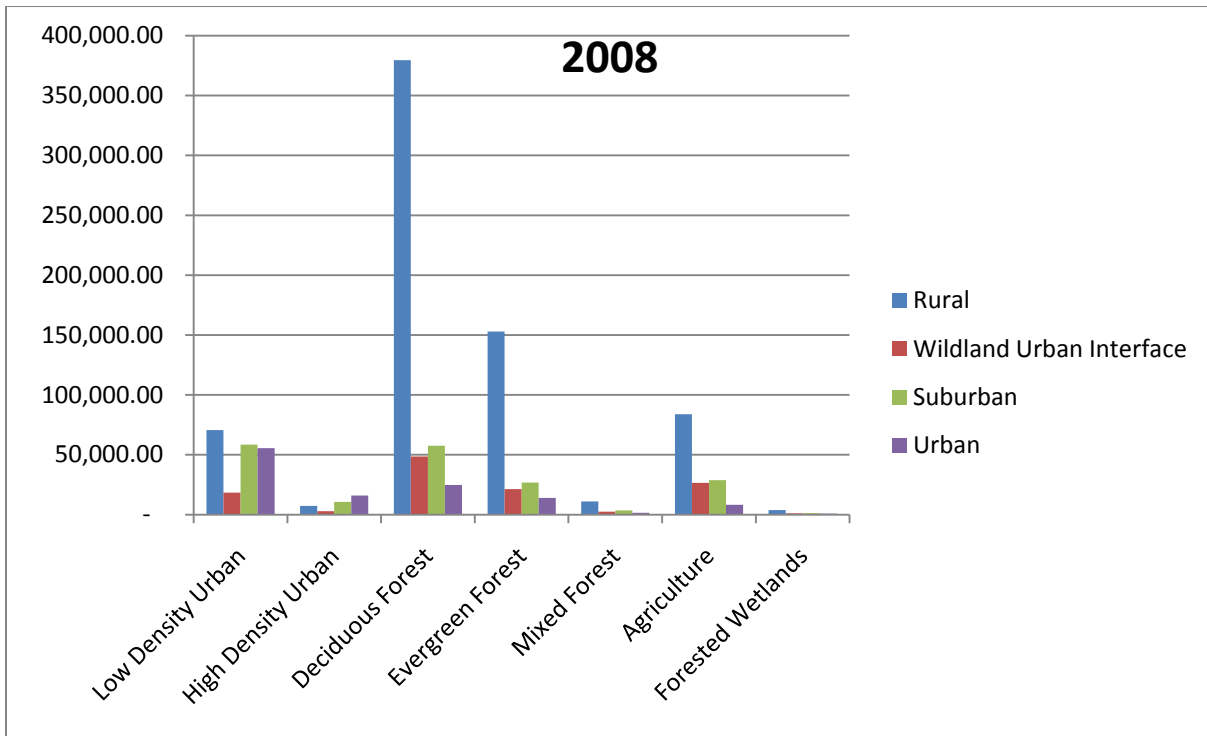
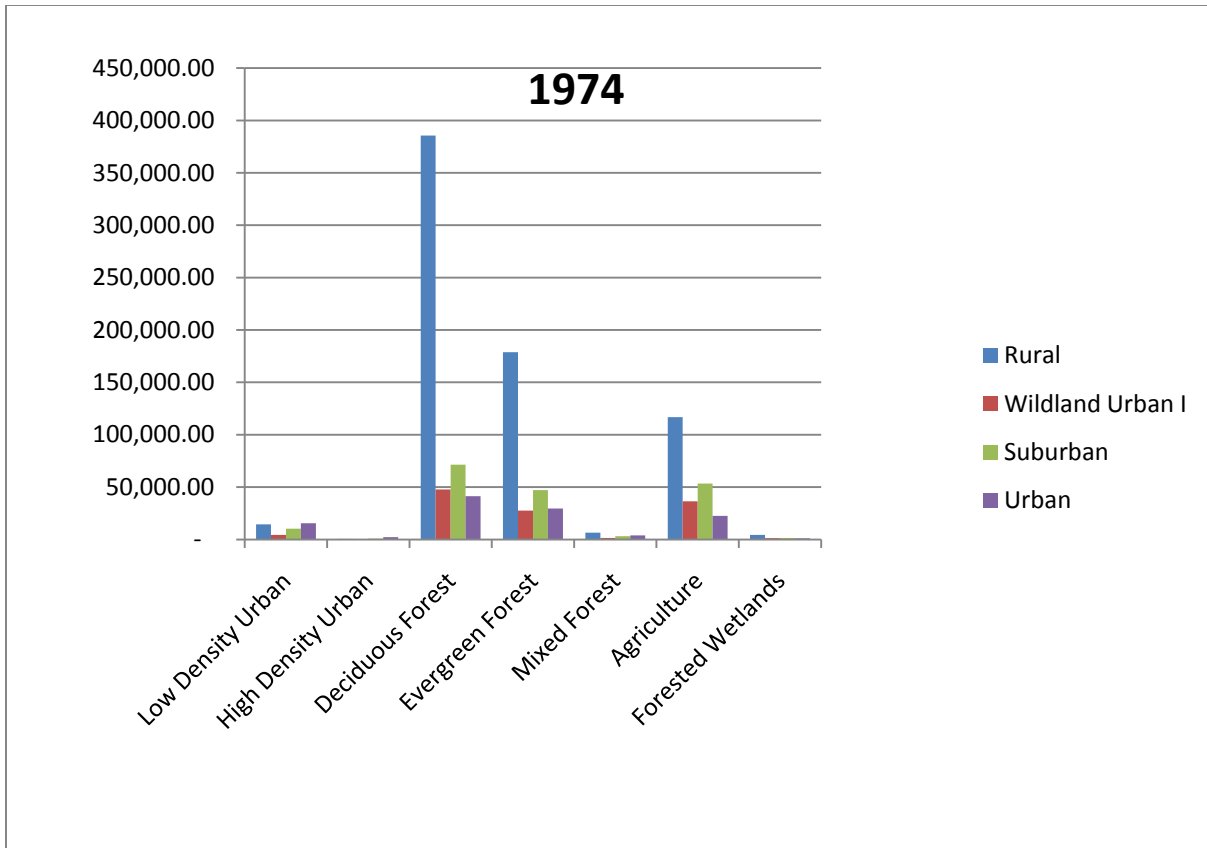
2008 (Acres)								
NAMES	Low Intensity Urban	High Intensity Urban	Clearcut/Sparse Vegetation	Dediduous Forest	Evergreen Forest	Mixed Forest	Agriculture	Forested Wetlands
Ridge and Valley	11,485	773	4,702	76,366	38,474	2,494	19,265	930
Blue Ridge	33,369	2,179	7,379	227,059	75,649	5,267	21,774	1,234
1974 (Acres)								
Ridge and Valley	2,042	101	6,595	81,430	34,740	484	28,389	1,116
Blue Ridge	7,168	137	10,557	226,773	98,122	4,735	25,652	1,662

The table above reports the acres of each land cover categories in 2008 and 1974 found in priority areas. The forest cover in these areas showed only small losses compared with the changes in the rest of the watershed. There was a dramatic increase in urban low intensity urban area over the 34 year period. These changes reflect the areas of public land that has remained forested while privately owned forests have been experiencing a dramatic transformation to suburban and exurban housing development.

The figure below depicts the priority areas for the Sustainable Community Forest Program. The areas are identified based upon population density data calculated from the US Census Bureau's census tract information. Areas with high population densities (above 1000 people/sq mi) are urban, suburban populations are 700 - 1000 people/sq mile, and Wildland Urban Interface is from 300 - 700 people/sq mile.

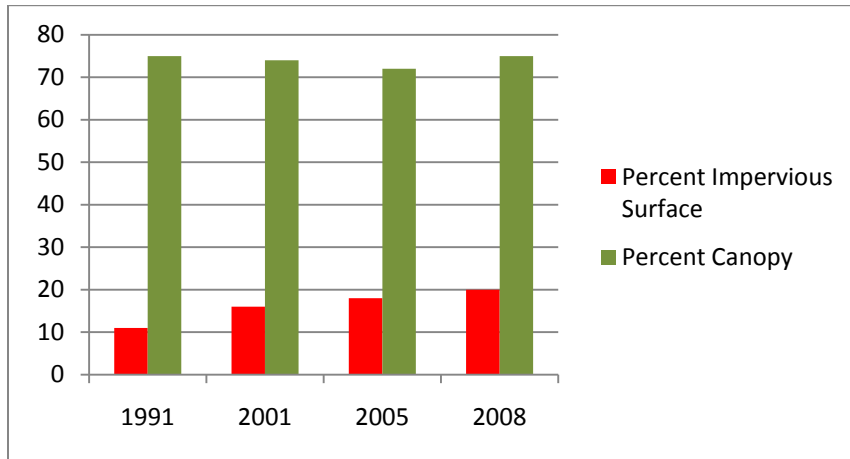


In the period between 1991 and 2008 tree canopy cover remained fairly stable in the watershed. However there was a large increase in the percent of impervious surface throughout the watershed. Impervious surface was at 11% in 1991 and increased to 20% in 2008.

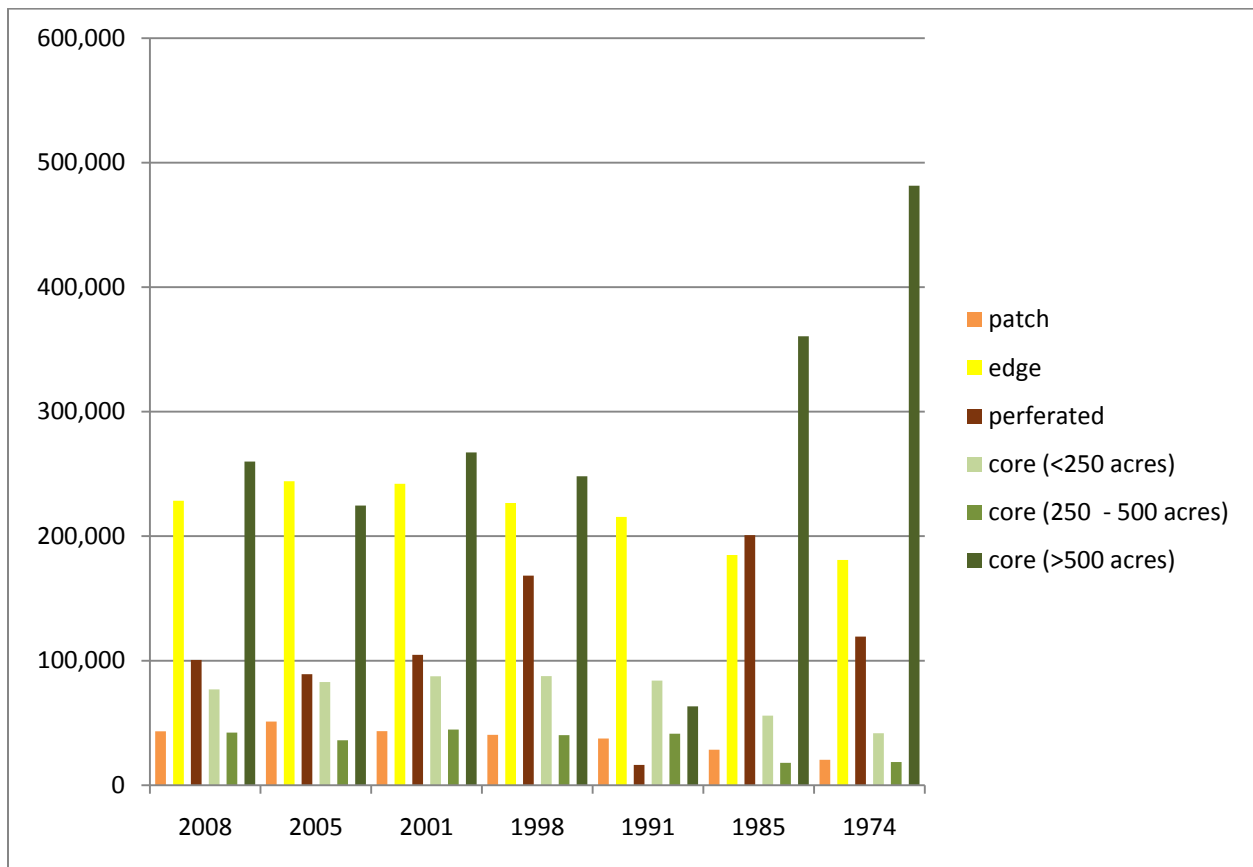


The two charts above represent land use change in each of the Sustainable Community Priority areas. There was a slight loss of forest within all of the forest classes in all of the areas between 1974 - 2008.

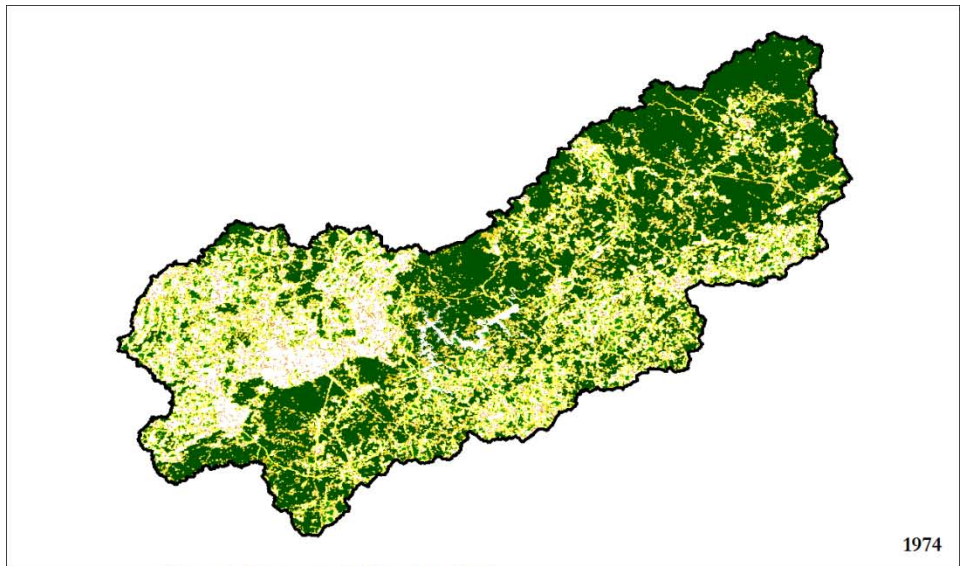
The biggest change that occurred was the increase in how density urban land use and the loss of agriculture in the area. Therefore, most of the development is taking place at the expense of agriculture in the basin with the potential for increases in forest cover over time.



In 1974 almost 500,000 hectares of forest was found to be in large patches of greater than 250 acres. over the course of the next 34 years there was a considerable loss of forest patch connectivity. By 2008 on 260,000 were still in larger patches. The fragmentation resulted in a continuous increase in edge and isolated patches of forest.








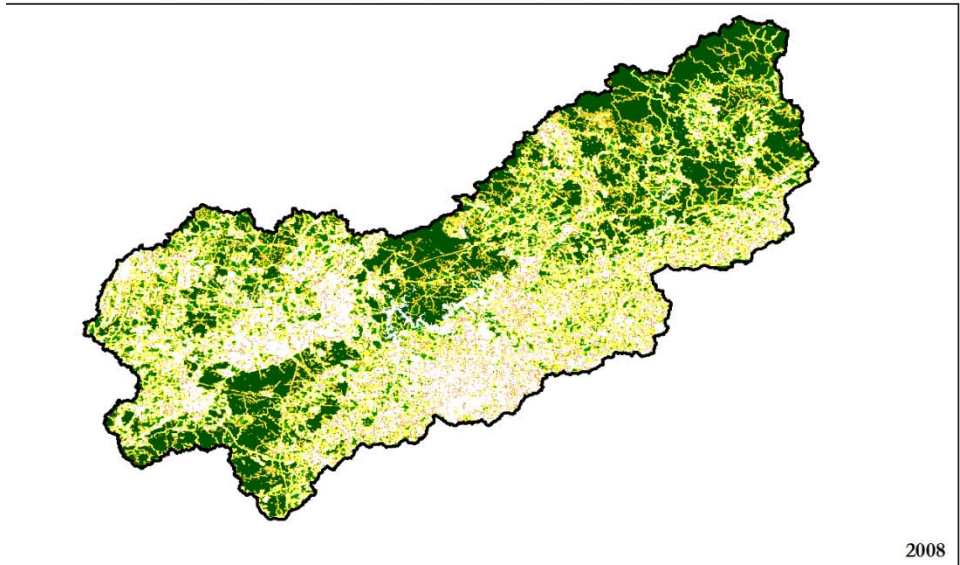
Maps of forest fragmentation for the watershed are seen below. Large forest core areas are still seen in the northern part of the watershed. These lands are predominantly public lands that are either owned or managed by the US Forest Service or Georgia DNR. Much of the fragmentation has occurred in the lower part of the watershed and corresponds to urban growth which has moved up from metro Atlanta in Cobb, Cherokee and Forsyth counties. This increase in fragmentation threatens water quality, and biodiversity protection. (See the data layers available for viewing at <http://narsal.uga.edu/glut/maps/interactivemap.html>)



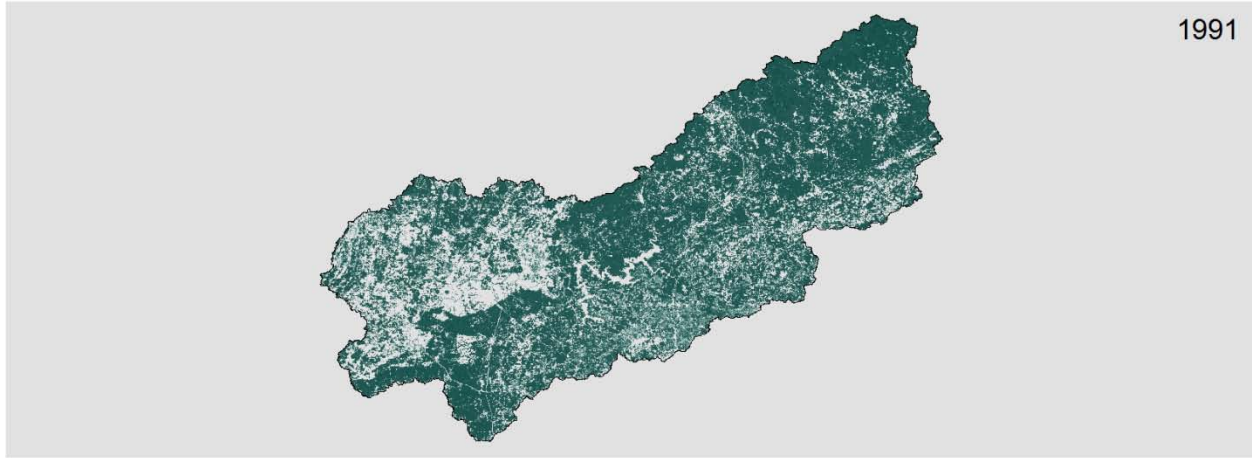
1974

**Forest Fragmentation Analysis**

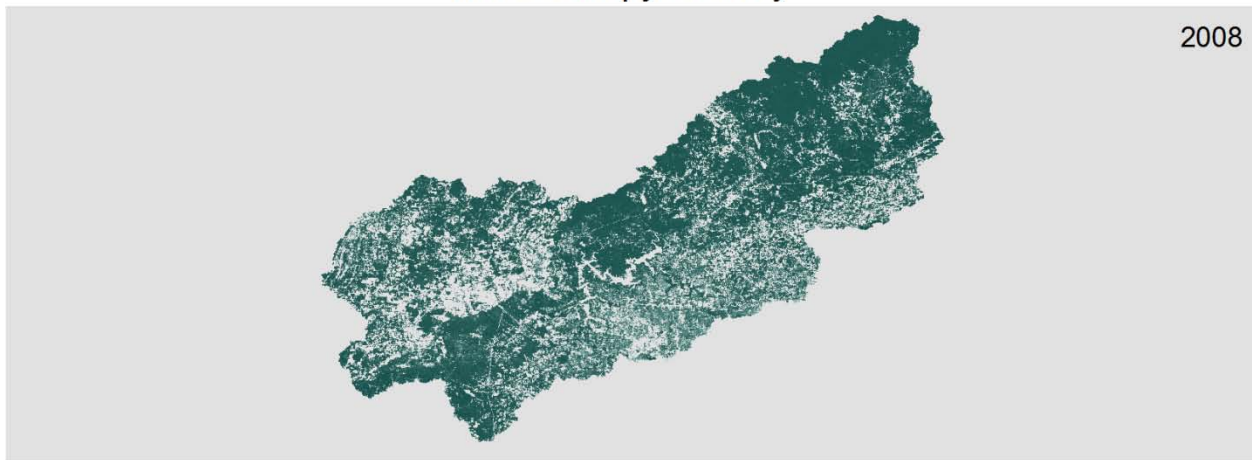
- |   |  |  |
|---|--|--|
|  patch |  perforated         |  core (250-500 acres) |
|  edge  |  core (< 250 acres) |  core (> 500 acres)   |



2008

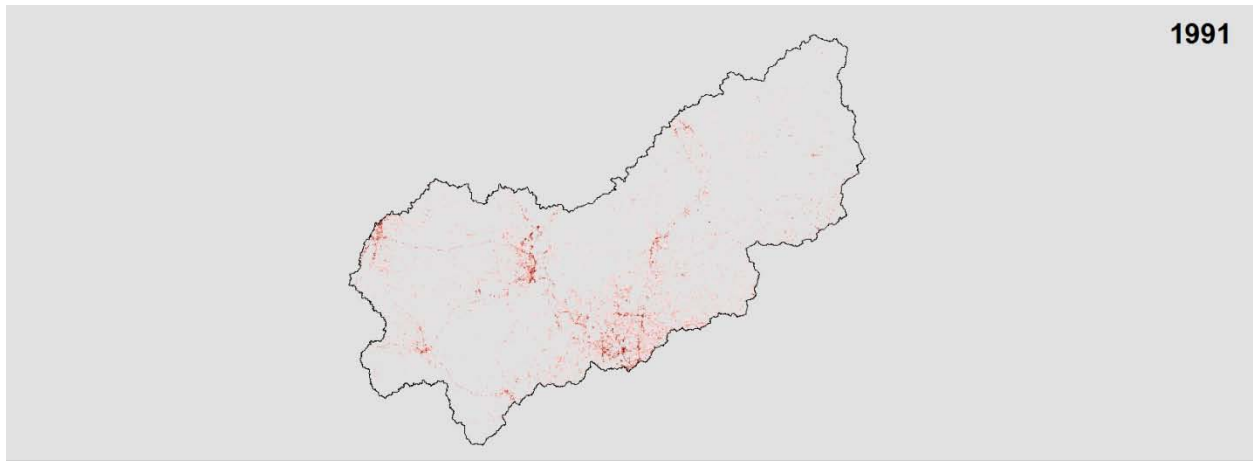


Tree Canopy Density

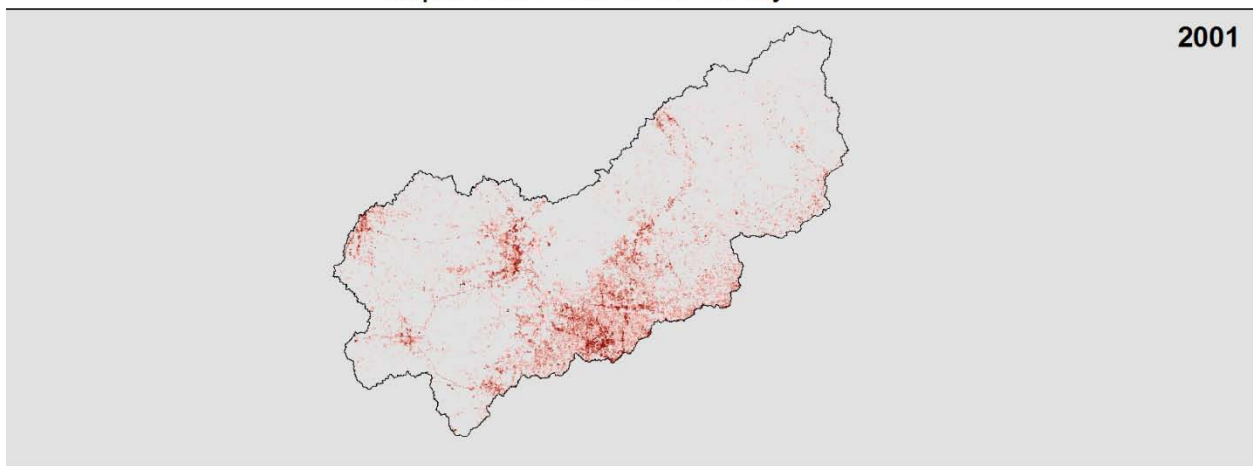


Tree canopy density maps indicate a modest loss of tree canopy cover in areas of high urban growth this includes Cobb, Cherokee, north Fulton and Forsyth Counties, all in the southern part of the watershed. In addition canopy loss occurred along the Georgia 400 corridor through Dawson county.

Impervious surface density maps show increases in impervious surfaces and heavy development in the southern part of the watershed and along the GA 400 Corridor and around Cartersville in Bartow County. Much of the growth is restricted from the northern part of the watershed because it is mostly part of the Chattahoochee National Forest.

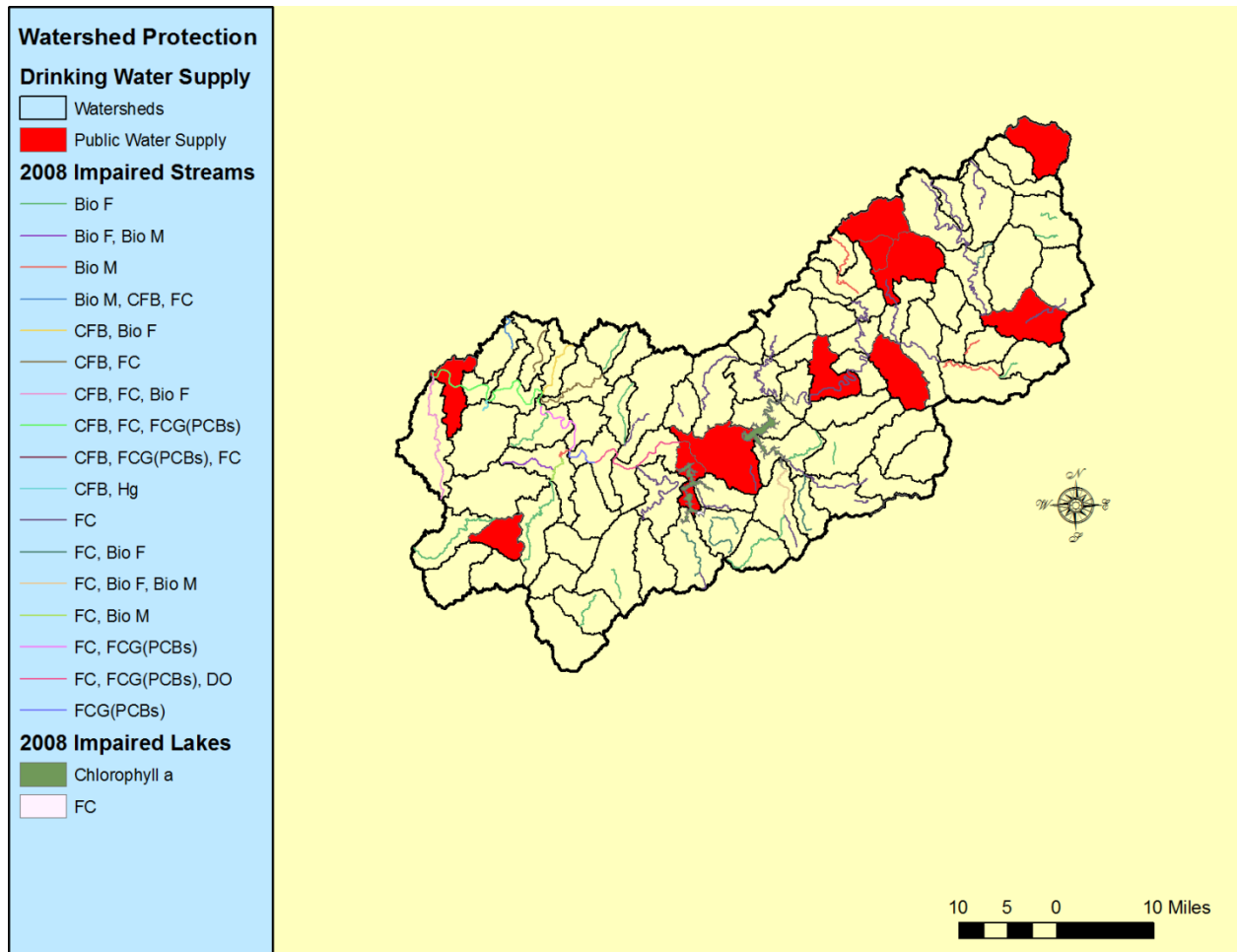


Impervious Surface Density

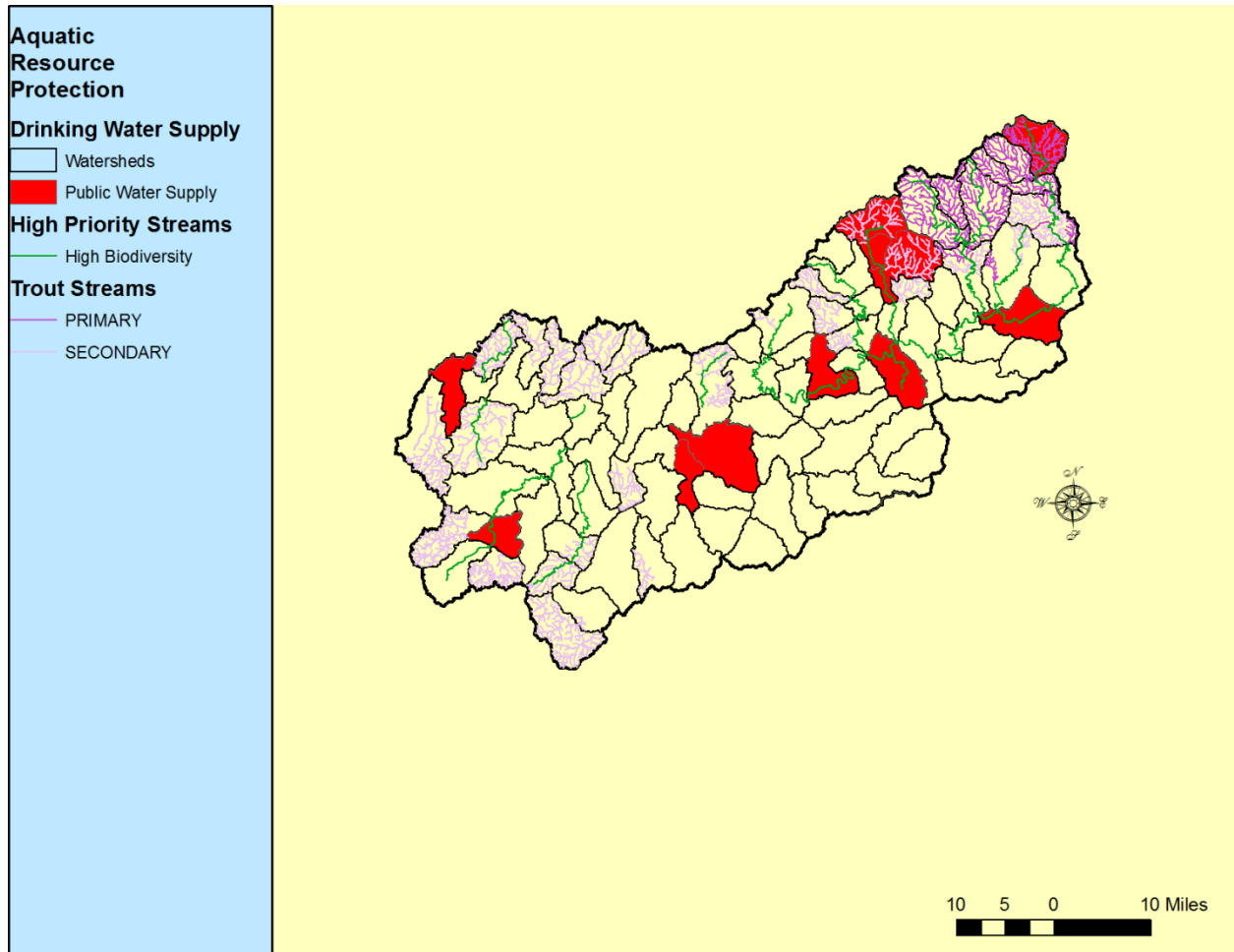


The interactive map server, provides users with the ability to view changes in land cover, impervious surface and canopy cover over the course of 34 years in the Etowah watershed and the entire state of Georgia. Other data available includes information on water resources such as listed impaired water bodies, locations of drinking water supply watersheds, wildfire and forest health threats, floodplains, wetlands, and high biodiversity areas. All of this information can be used for planning activities.

Below is a map showing water quality information and the location of watersheds that protect drinking water supply. Forest restoration programs can help local communities better protect their drinking water supply by reducing the non point source pollution that causes much of the impairment in the Etowah watershed. These stream impairments are from urban and agricultural runoff. Reforestation programs that are supported by farm bill programs such as EQIP and other programs sponsored by the Georgia Forestry Commission can help land owners and communities better protect these resources. The information in this map can be used to help prioritize programs across the watershed.



In addition to drinking water concerns, the streams and rivers in the Etowah Watershed are important for trout and other rare fishes. The map below shows where watershed restoration efforts might be prioritized for the protection of both drinking water supply as well as key recreational opportunities such as trout fishing and the protection of rare species.



There is an opportunity to work with these data to develop watershed protection and other green space plans. Consultation with local stakeholders indicated that it is critical to begin to develop better estimates of BMP efficiencies for these forested areas or potential restoration sites, before they would want to utilize the information. Stakeholders will not invest in planning until they can see hard numbers which show both economic and environmental benefits of forest management beyond traditional forestry applications.