Cobbs Creek Reservoir Study Area Site Analysis

Prepared by the Community Design Assistance Center
Fall 2008

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College of Architecture and Urban Studies
Virginia Polytechnic Institute and State University

Acknowledgements

The CDAC Design Team would like to thank the following individuals for their support and guidance on the preparation of this site analysis:

Michael Cooper, Assistant County Administrator, Cumberland County
Ben Johnson, Professor, Landscape Architecture, Virginia Tech
John Provo, Senior Economic Development Specialist, Virginia Tech Office of Economic Development
Andrew Sorrell, Planning and Zoning Administrator, Cumberland County


CDAC design team meeting with John Provo and Marc Oliphant


CDAC design team and Professor Ben Johnson

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Project Description

The Community Design Assistance Center (CDAC) was charged, as a part of the Virginia Tech/Virginia Commonwealth University project team, to prepare a site analysis for a study area of approximately 1000 feet around the Cobbs Creek Reservoir. The CDAC team began by obtaining base information, through the help of the Cumberland County Planning Department, related to current recreational sites/activities within the county, as well as cultural and physiological information related to the project study area. A site visit was made in May 2008 to tour the study area and visit other portions of the County.

Information gathered by the CDAC team has been organized and is presented in this document as 11x17 maps with accompanying text descriptions. This information is intended to serve as a guide for future conceptual design development of the area.


Oakwood United Methodist Church, lcoated off Columbia Road


Tree-lined views offered on parts of Columbia Road


Open grass fields in the project study area

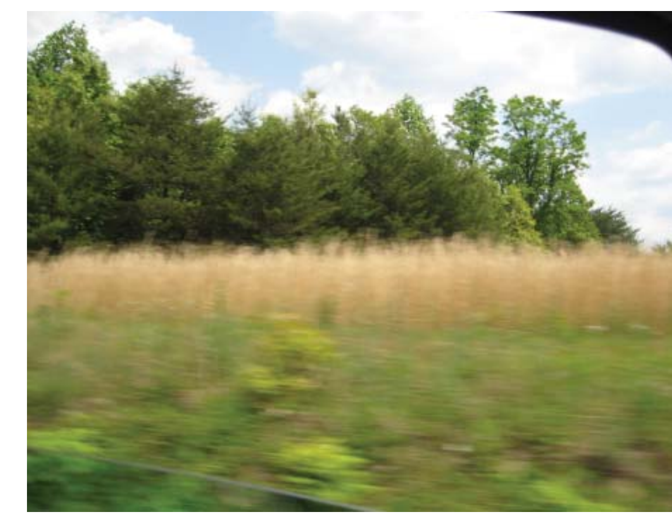
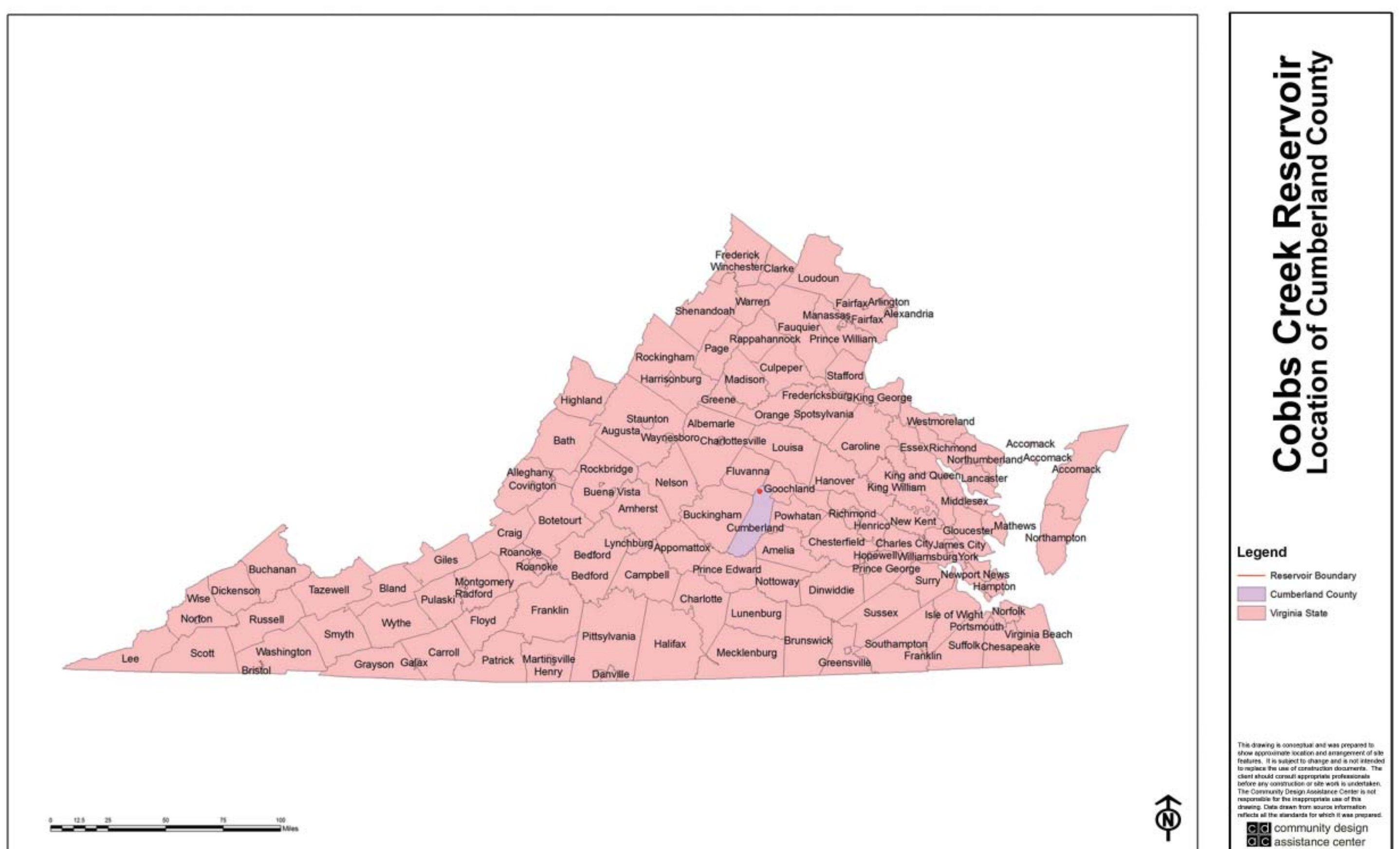

Planted field in the study area


Image of the James River from the bridge leading into the town of Columbia


Forested track in the project study area

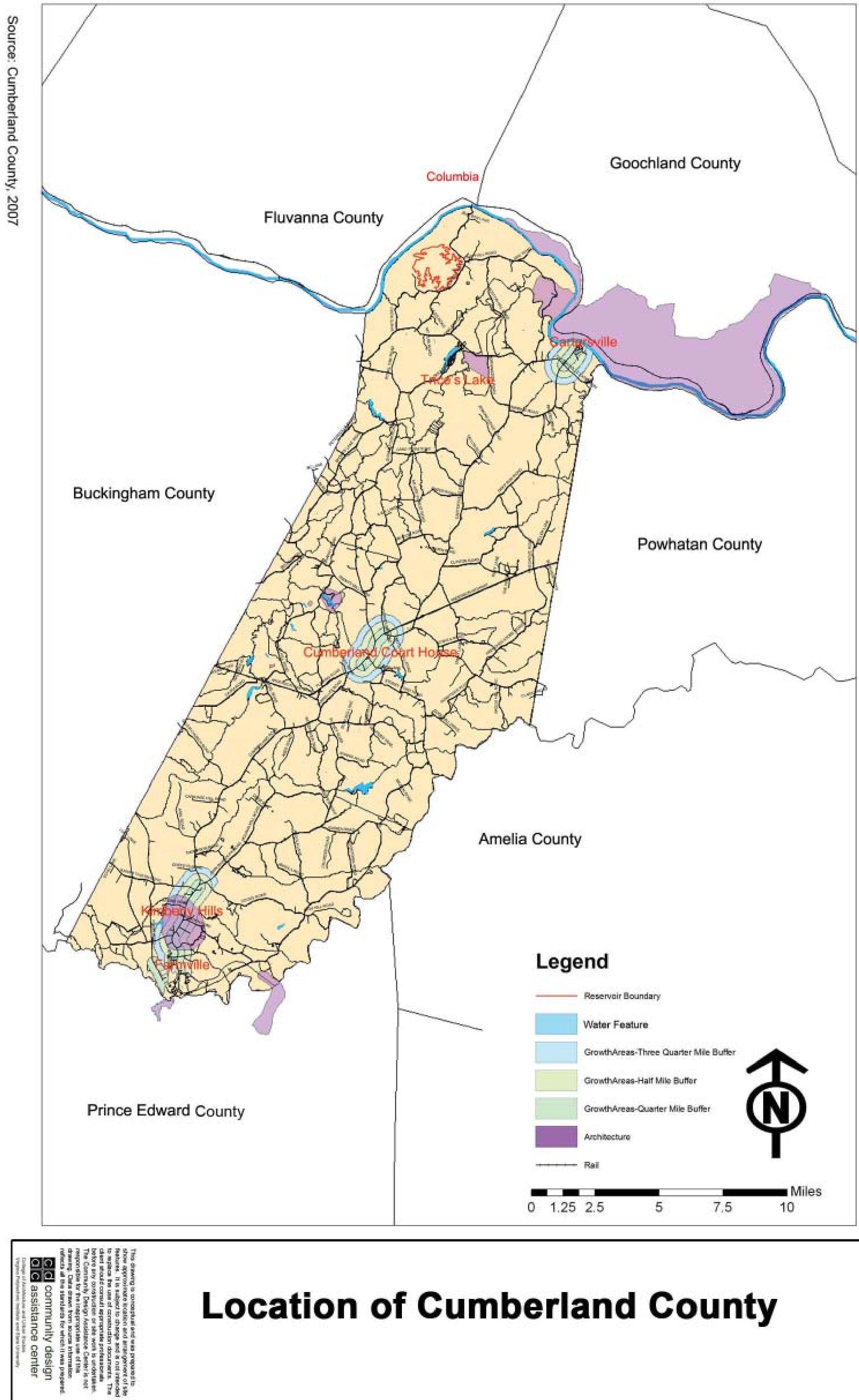
Project Context

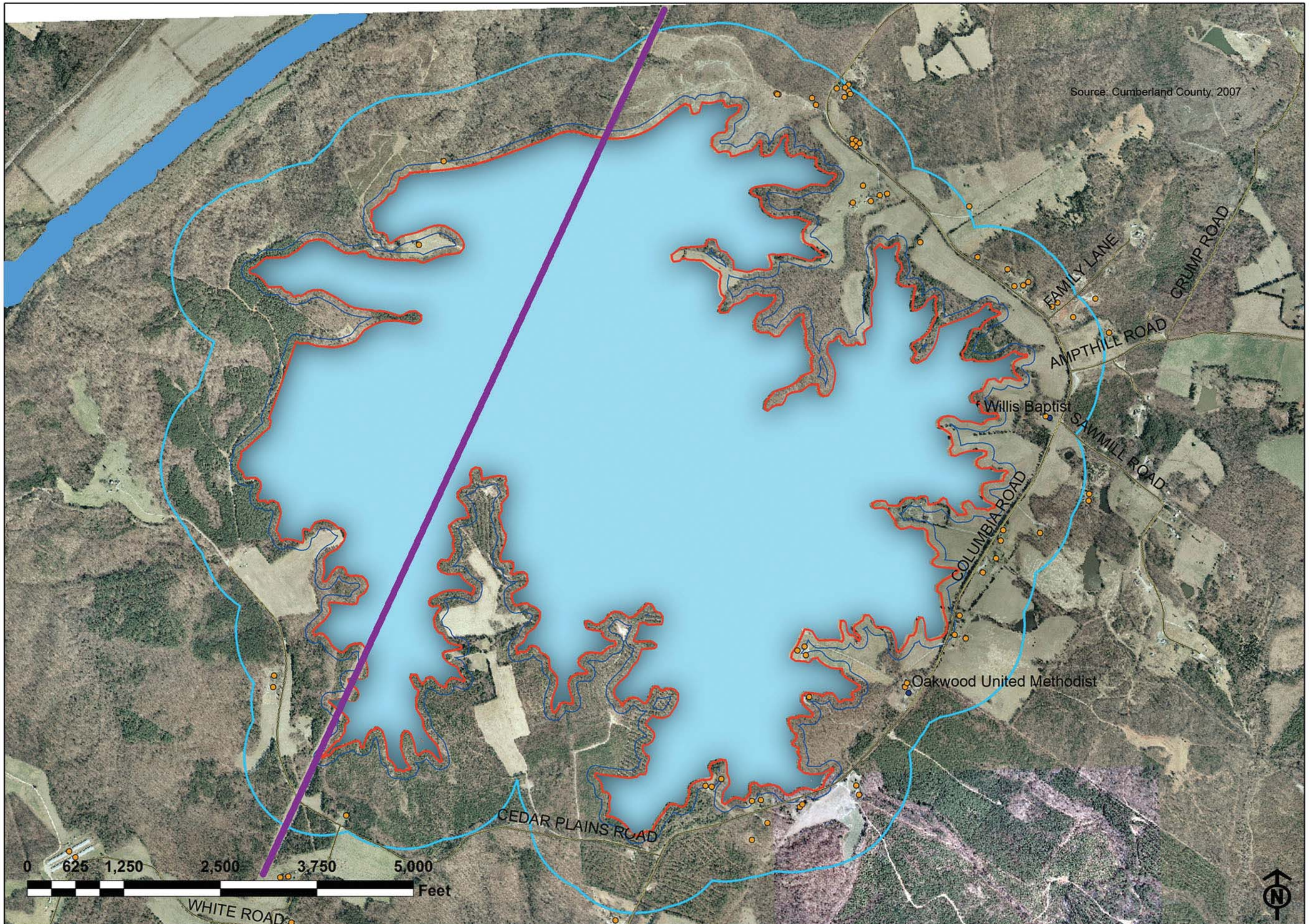
The proposed Cobbs Creek Reservoir is located in the northwest corner of Cumberland County, in close proximity to the James River as well as Fluvanna and Goochland Counties. The area can be described as rural residential with both seasonal and full time residents in the immediate area. A gas pipeline passes through the site and will need to be rerouted upon the construction of the reservoir. An overhead power line runs adjacent to the gas pipeline.



Source: US Census Bureau, 2000

Source: Cumberland County, 2007





Cobbs Creek Reservoir
Location Analysis

Legend

- Reservoir Boundary
- 1000 Foot Study Area
- 100 Foot Study Area
- Buildings
- Major Roads
- Utility Line Current Alignment
- James River

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Existing Recreational Opportunities

Cumberland County is home to a range of recreational opportunities for its residents, including Bear Creek Lake State Park and Cumberland State Forest. A network of trail systems are also developing. There are opportunities to expand the trail network to connect the northern portion of the county, including the proposed Cobbs Creek Reservoir. There are two public access points to the James River on the northern edge of the county and several smaller lakes that offer limited forms of public use/access. The Cobbs Creek Reservoir would be the largest water body within the county for potential recreational use.

The following is a description of Bear Creek Lake State Park and Cumberland State Forest and the recreational opportunities found there:

Bear Creek Lake State Park is located 4.5 miles northwest of the town of Cumberland. Bear Creek Lake features overnight cabins, a lodge, permanent camp sites, and picnic shelters. Swimming and boating are allowed at the lake, and boat rentals are available. The park also has trails for hiking and running.

The 16,233-acre Cumberland State Forest is north of State Route 60, west of State Route 45 and bordered on the west by the Willis River. The Forest has multiple purposes, including watershed protection, recreation, timber production, hunting, fishing, and applied forest research. There are two self-guided trails at Cumberland State Forest that are open for walking, hiking, horses, and mountain bikes. These are the Cumberland Multi-Use Trail (14 miles) and the Willis River Hiking Trail (16-miles). White-tailed deer, wild turkey and bobcats are common residents of this natural area. The State forest also features five lakes which may be fished from with a Virginia State fishing license, including: Oak Hill Lake, Bear Creek Lake, Winston Lake, Arrowhead Lake, and Bonbrook Lake.

Cumberland Multi-Use Trail is 14-mile loop trail weaves through the State Forest and Bear Creek Lake State Park. Trailheads are located at the Cumberland Forestry Center and Bear Creek Lake State Park. The trail is marked by blue blazes painted on trees approximately every 150-200 yards. Foot travel, non-motorized bikes, and horses are permitted.

Willis River Hiking Trail is a 16-mile loop trail follows the Willis River that borders the Forest. The trail is marked by white blazes painted on trees every 150-200 yards. While traveling through the forest, you will observe several different and unique environments. Oak-hickory forests, stands of Loblolly Pine, and harvested areas attract many different forms of wildlife. White-tailed deer, wild turkey and bobcats are common residents of this productive and well managed natural resource.

The following is a summary of recreational opportunities, by category, found in Cumberland County:

Hiking:

Cumberland Multi-Use Trail, Willis River Hiking Trail

All Terrain Vehicles (ATVs):

ATVs are not permitted on any of the state forests.

Camping:

Camping is only allowed in the Bear Creek Lake State Park.

Canoeing:

Canoeing is permitted on Bear Creek Lake.

Fishing:

A Virginia fishing license is required to use the five lakes located within the forest:

- Bear Creek Lake located at Bear Creek Lake State Park
- Oak Hill Lake located off of Route 629
- Winston Lake located off of Route 629
- Arrowhead Lake located off of Route 629
- Bonbrook Lake located off of Route 626

Horseback Riding:

Coggins Test Certificates must be available for each horse on State lands.

Hunting:

Hunting is permitted on the Cumberland State Forest. All persons, except those legally exempt under Virginia law, must carry a valid Virginia hunting license and a State Forest Permit ($16 per year) to hunt or trap on the forest.

Picnicking:

One shelter is available on the forest at Winston Lake on Route 629.

Permanent structures are set up with Bear Creek Lake State Park.

Swimming:

Swimming is permitted in Bear Creek Lake.

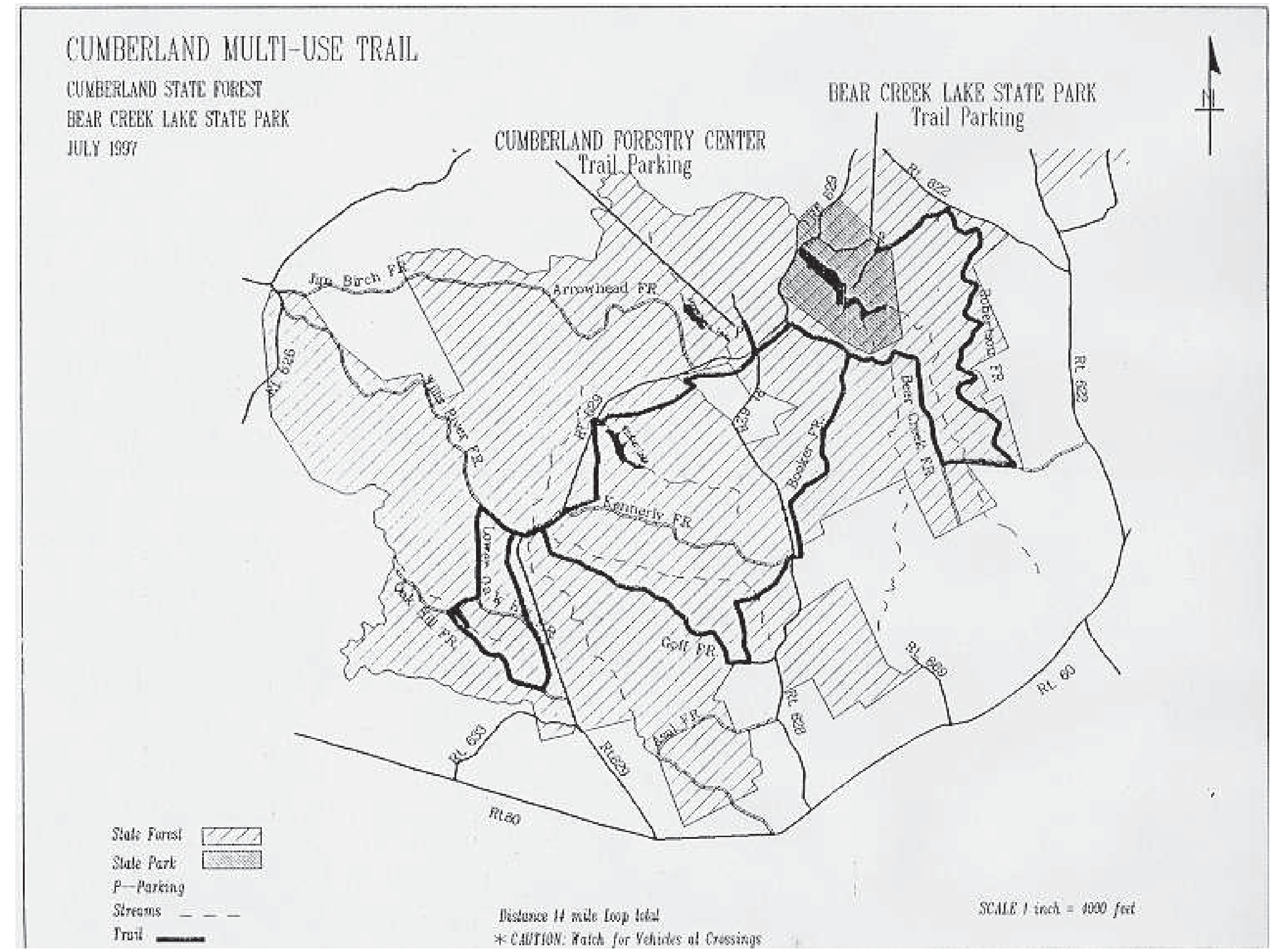
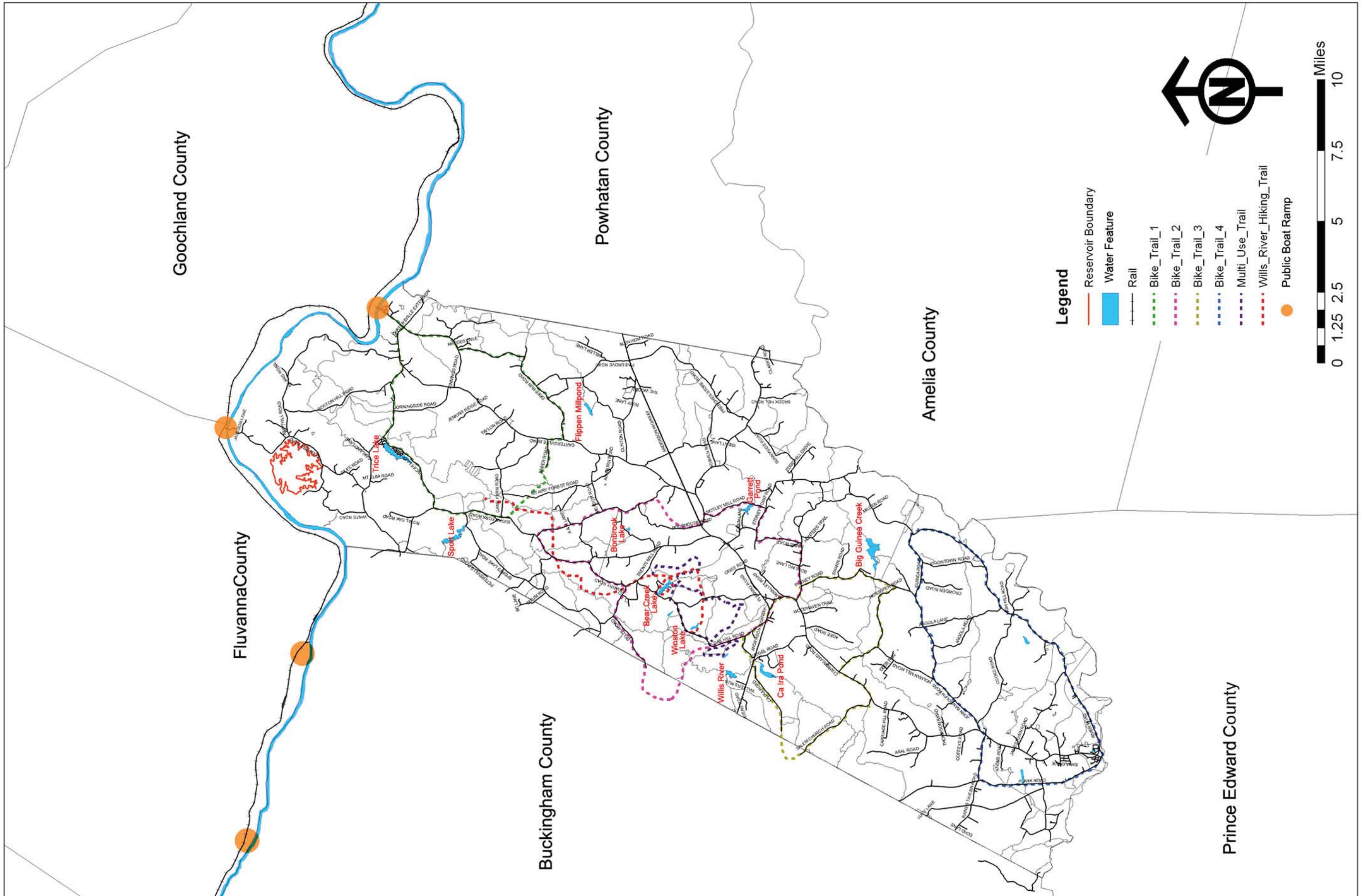


Image taken from http://www.dof.virginia.gov/stforest/images/csf-map-trail.jpg

Recreation of Cumberland County



Source: Cumberland County, 2007

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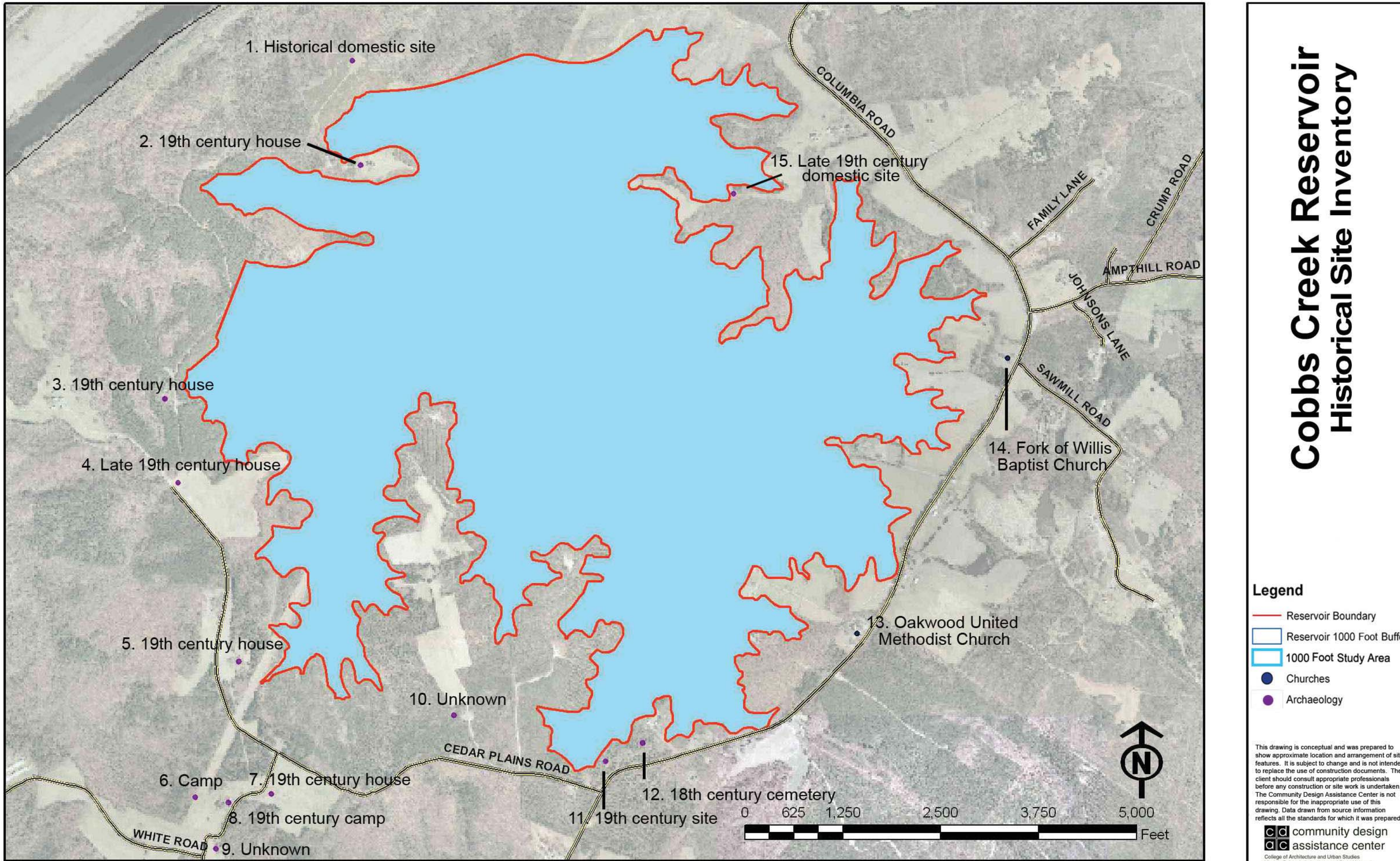
Cultural Inventory & Analysis

The CDAC design team looked at historical site information, area views and landscapes, and potential public access points to the reservoir. The following maps and text describe information gathered and presented.

Historical Site Inventory

Archeological data obtained by the County from the Department of Historic Resources is documented in the map to the right. Some additional text information was taken from the Cobbs Creek Reservoir Project Joint Permit Application prepared by Malcolm Pirnie. The map highlights known structures or locations where artifacts have been found around the proposed reservoir. More detailed information about each structure or location may possibly be obtained through the Richmond office of the Department of Historic Resources.

Additional examinations should be made prior to development around specific structures listed on the map to the right.



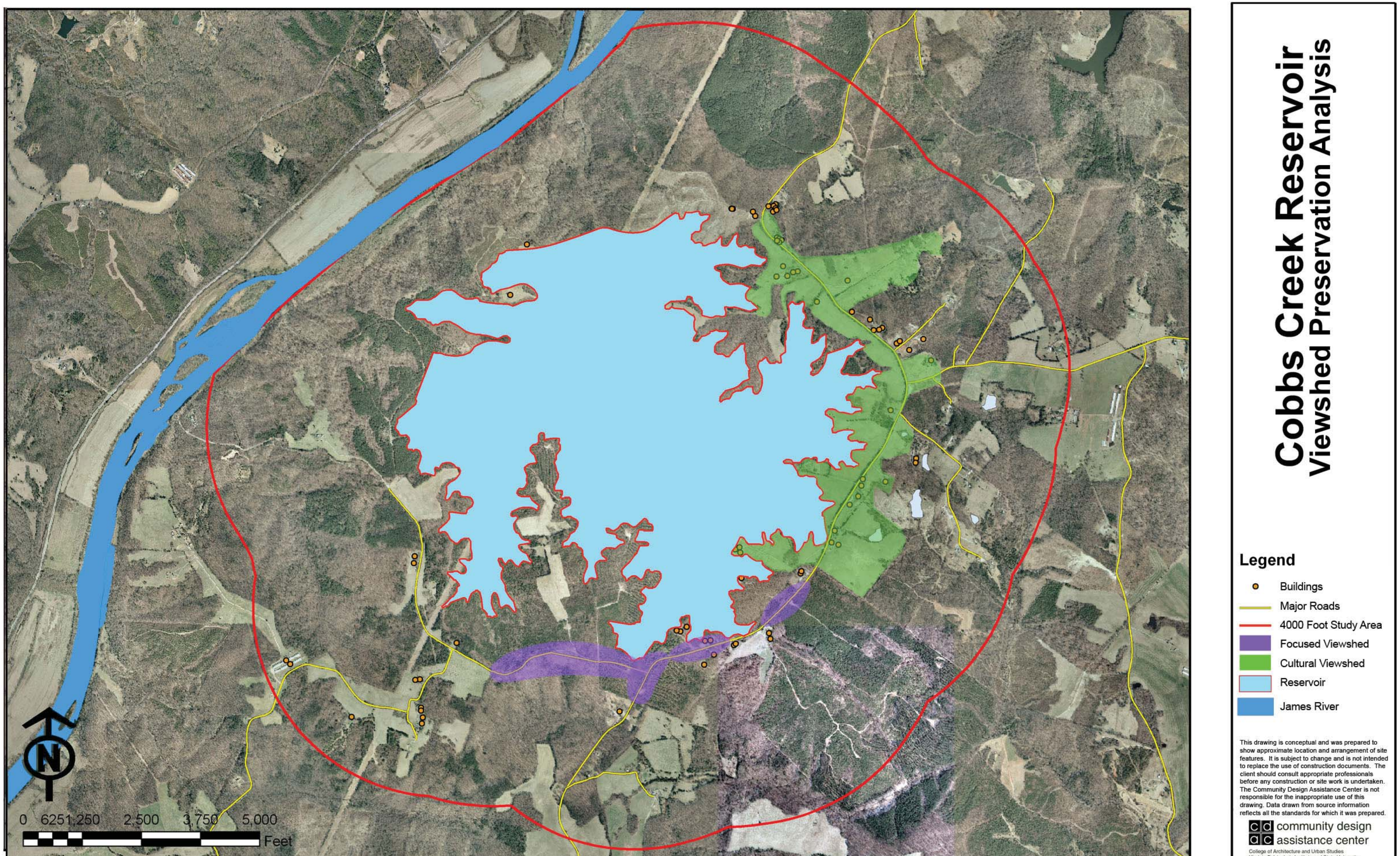
Source: Cumberland County, 2007

Viewshed Preservation Study

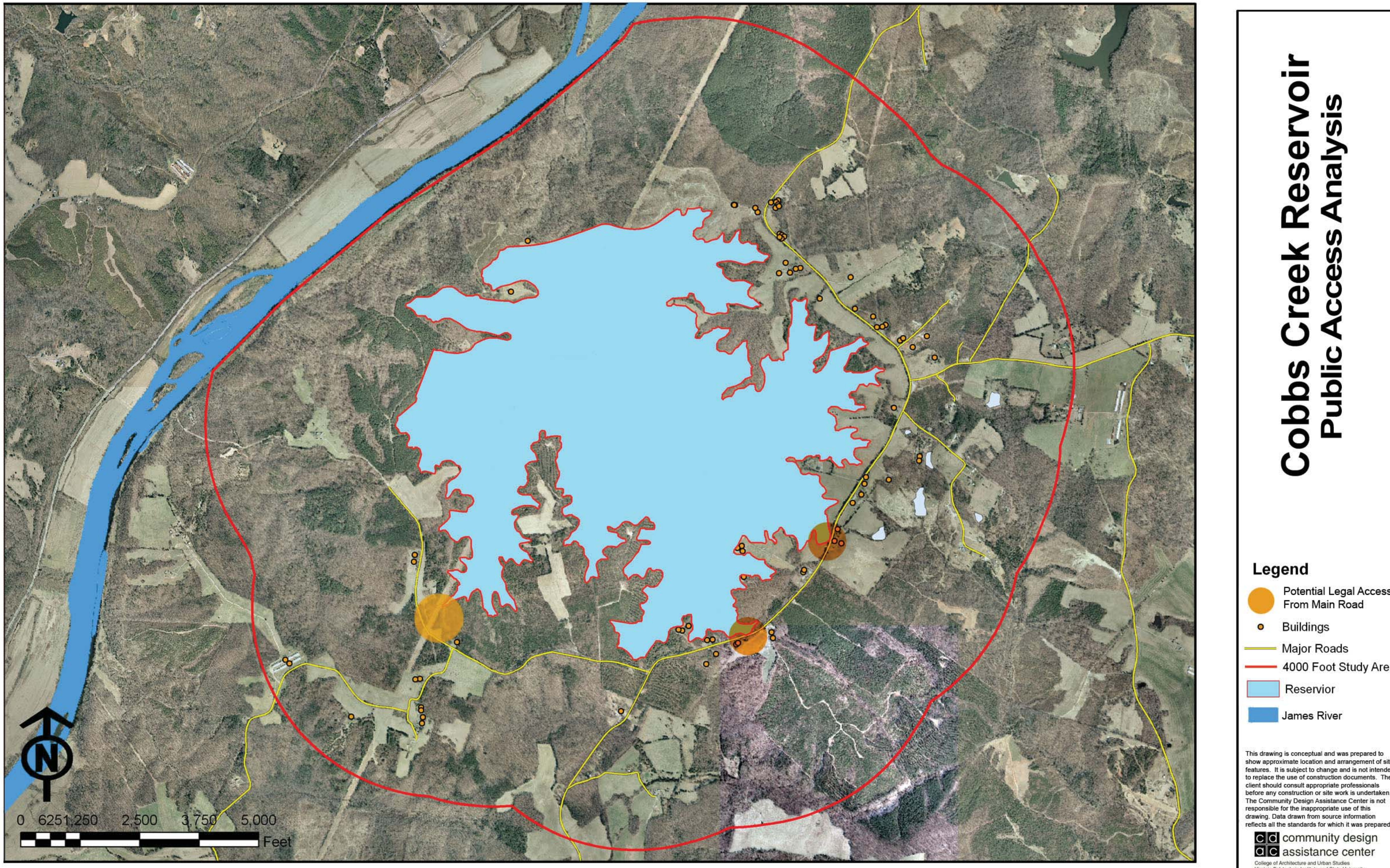
Through a site visit and conversations with Cumberland County staff, the CDAC team discovered the charming rural character that should be retained, if possible, as future development occurs. Several wooded corridors and open areas have been identified. These areas should be preserved, in terms of their viewsheds from the adjacent roads. Cultural viewsheds, as identified on the map on page 13 are open, grassed or agricultural lands. Focused viewsheds, as identified on the map on page 13, describe the tunnel-like views that are offered to those traveling along Columbia Road.

Public Access Analysis

Three areas have been identified as potential legal access points to the reservoir by the CDAC team based on the proximity of existing public roads to these places. A range of factors, including community feedback and environmental suitability should influence the final site selection for public access points. A map documenting identified potential legal access points can be found on page 14.



Aerial imagery copyright 2006-2007 Commonwealth of Virginia



Aerial imagery copyright 2006-2007 Commonwealth of Virginia

Site Hydrology

Water circulates throughout the environment through precipitation, overland flow, infiltration, storage, and evapotranspiration. Groundwater moves by capillary action through the porous spaces between unconsolidated sand, gravel, and rock, and between the fractures and faults in the underlying bedrock. The surface of saturated area, the water table, generally mirrors the surface terrain. The surface of saturated groundwater is the source of local municipal wells; ground water pumping can have substantial impacts on the depth of the water table.

Topographic relief creates drainage patterns, which in turn influence vegetation associations and distributions. The spatial correlation between vegetation associations and site drainage patterns is particularly strong in arid and semi-arid landscapes. Although the groundwater vegetation linkage is more subtle in less arid environments, the continuous, or seasonal, saturation of soils creates suitable conditions for wetland vegetation. Other hydrological conditions may also influence vegetation patterns in other landscapes as well.

Water quality may also be affected by land uses and by associated land cover changes. Pollution of both groundwater and surface water is a common problem in urbanizing landscapes. Contamination may result from erosion and sedimentation, from chemicals, or microorganisms. Surface water pollution associated with storm water runoff in built landscapes can negatively impact ecosystems and reduce aesthetic and recreational values of rivers, lakes, and other water bodies. Groundwater pollution from septic tank effluent can also limit areas suitability for wells.

Text information for site hydrology was gathered from the following sources:

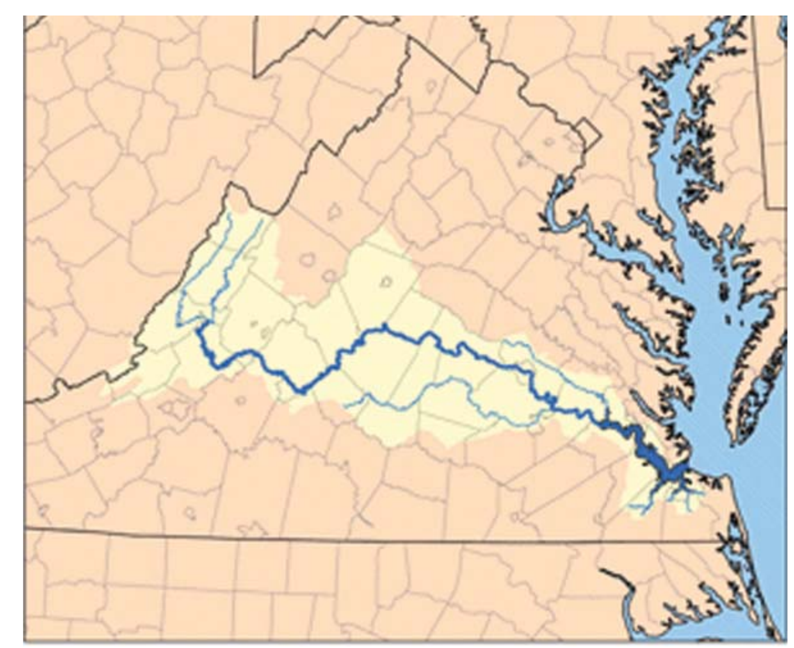
La Gro, James A. Site Analysis: Linking Program and Concept in Land Planning and Design. New York: John Wiley, copyright 2001.

http://addison.vt.edu/search~S1?/tSite+Analysis%3A+Linking+Program+and+Concept+in+Land+Planning+and+Design/tsite+analysis+linking+program+and+concept+in+land+planning+and+design/1%2C1%2C2%2CB/frameset&FF=tsite+analysis+linking+program+and+concept+in+land+planning+and+design&1%2C%2C2

http://www.amazon.com/Site-Analysis-Linking-Program-Planning/dp/0471344125/ref=pd_bbs_sr_2?ie=UTF8&s=books&qid=1229093159&sr=8-2

Watershed Analysis

The map on page 17 was generated based on elevation information and flow direction. Each colored area delineates a watershed of sorts - retaining water within the colored boundary.



Map of the James River.

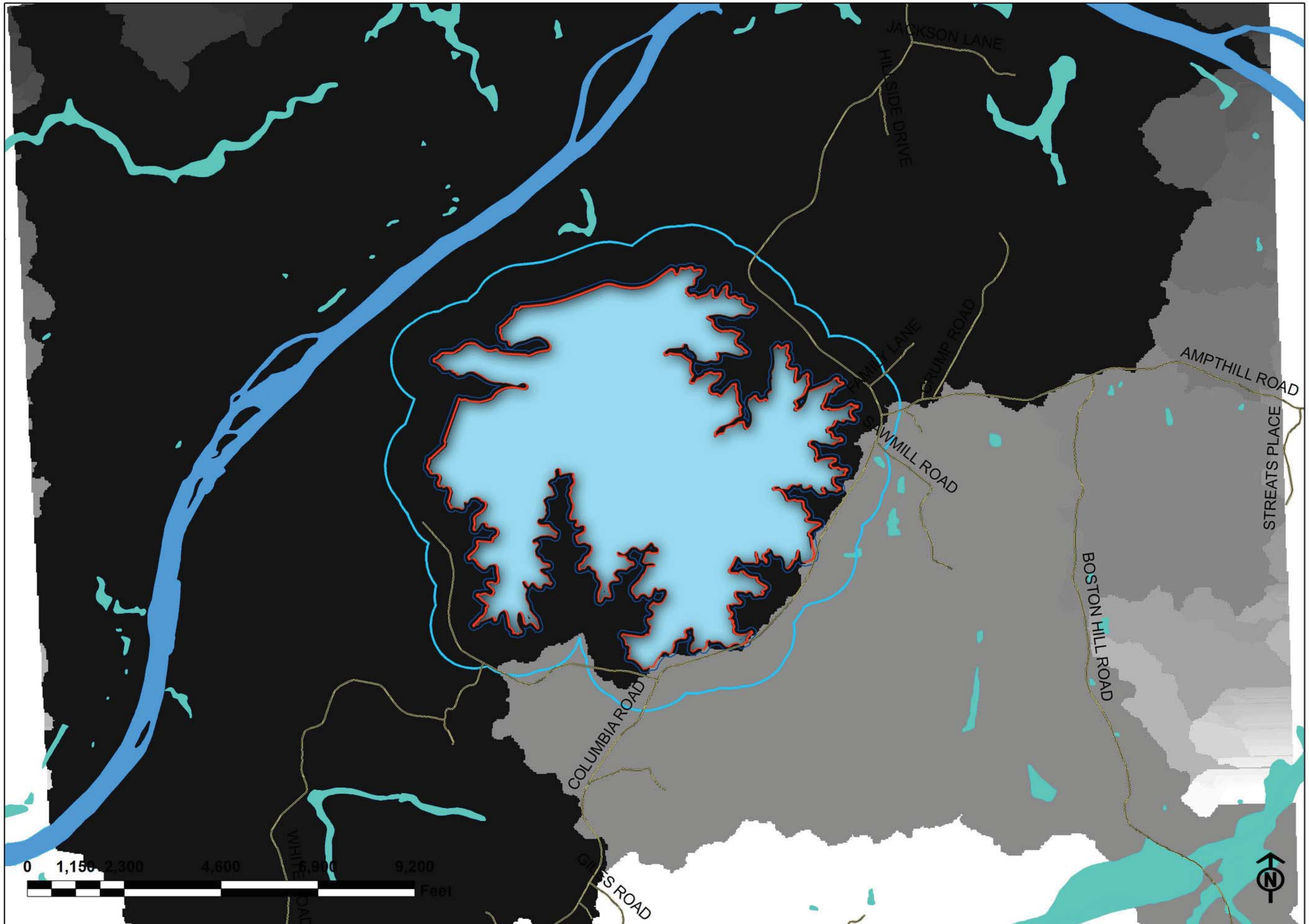
Floodplain Analysis

CDAC purchased flood zone mapping from the Federal Emergency Management Agency (FEMA). The mapping was overlaid on the project study area and shows the relationships of the James River flood zones to the reservoir and the project study area.

Wetland Analysis

Wetlands play an important role in the natural environment and should be given high value when considering potential future development. The information presented in the wetland analysis map on page 19 draws from both the National Wetland Inventory data, as well as data obtained from Cumberland County that was prepared as part of the Cobbs Creek Reservoir permit application.

Cobbs Creek Reservoir Watershed Analysis



Legend

- Reservoir Boundary
- 1000 Foot Study Area
- Reservoir 100 Foot Buffer
- Major Roads
- NWI Wetland
- Flood Plain #1
- Flood Plain #2
- James River

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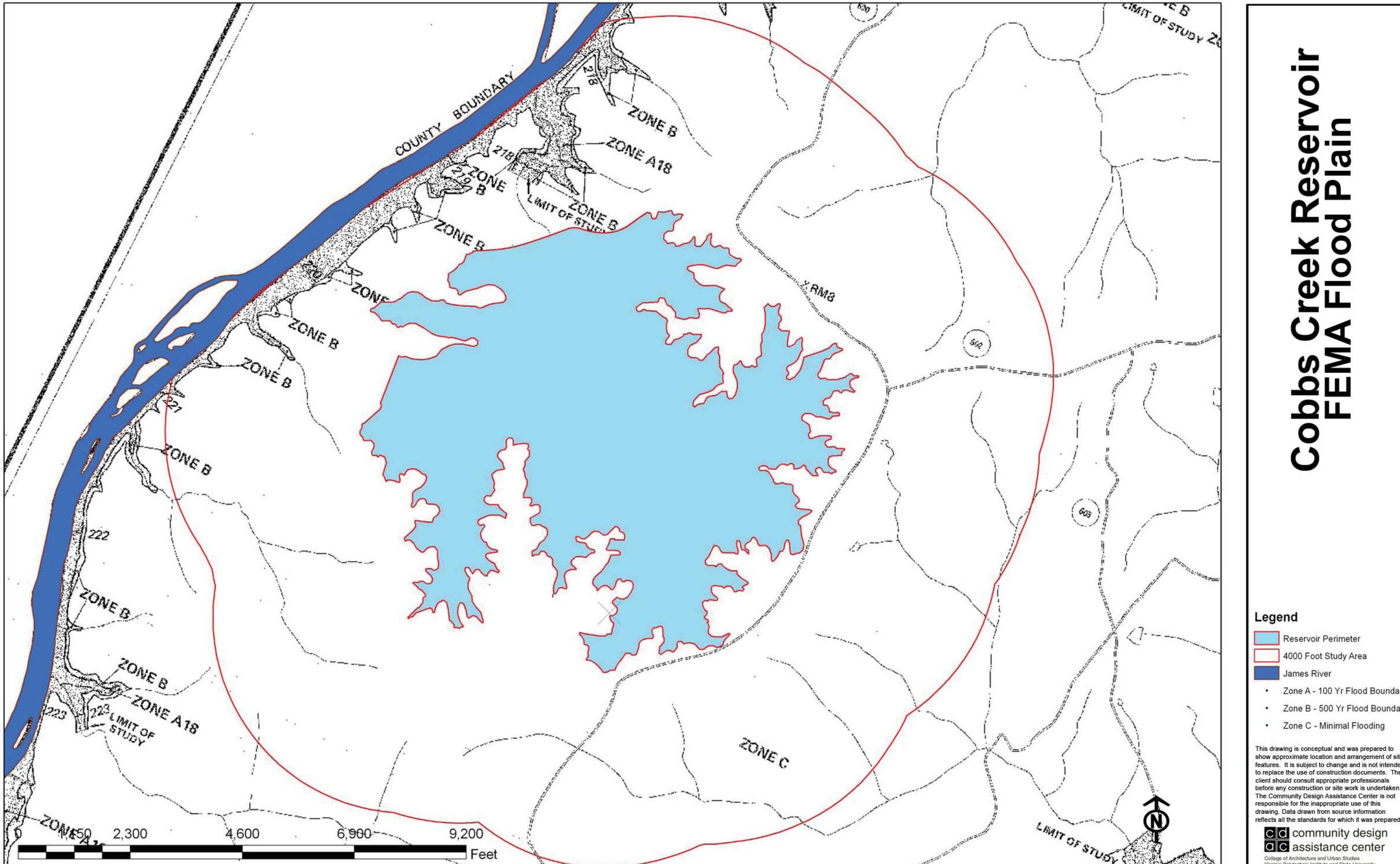
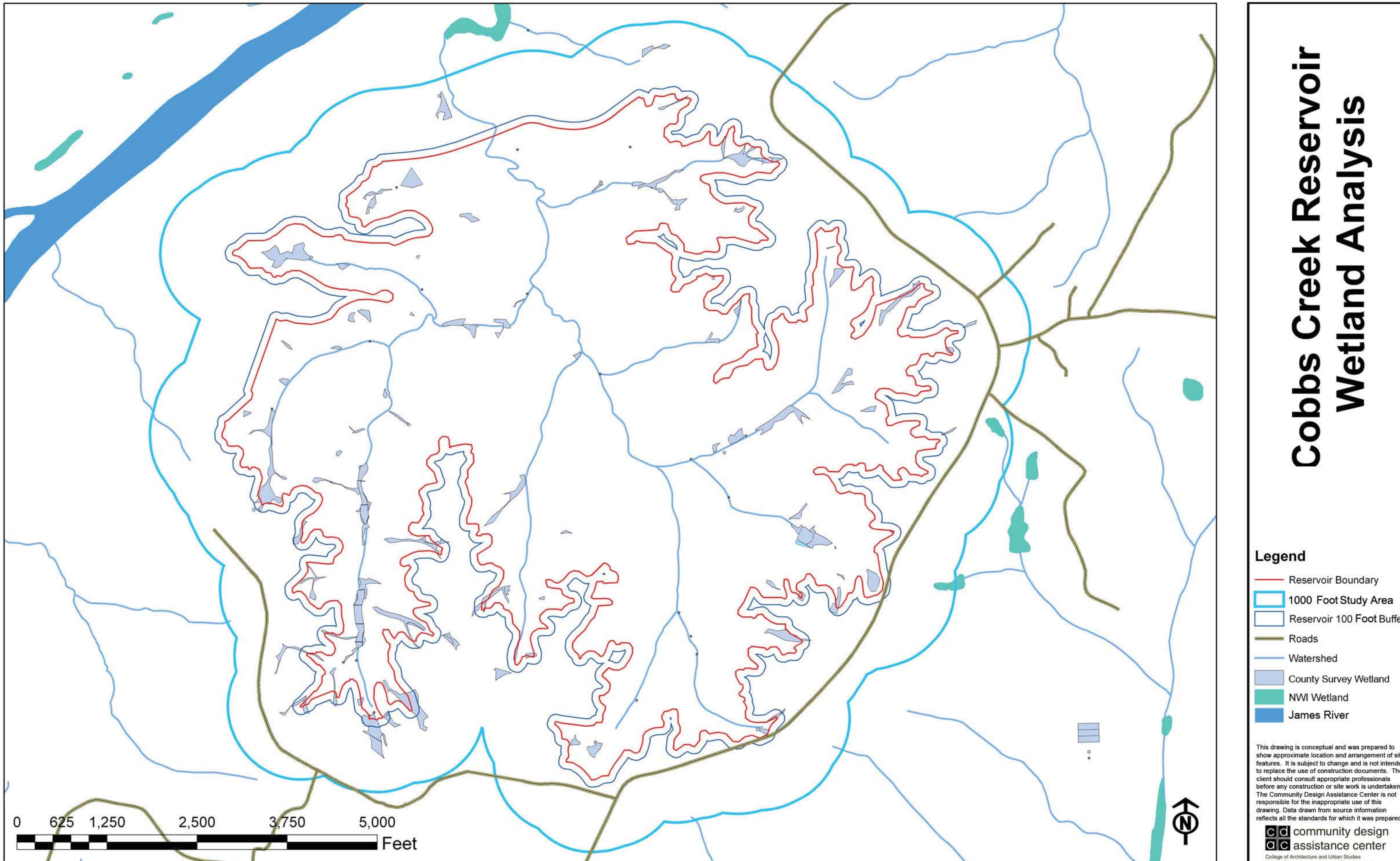
Source: Generated by spatial analyst from 10 meter United States Geological Survey Digital Elevation Model; National Wetland Inventory



Source: FEMA 1979



Source: National Hydrography Dataset ; National Wetland Inventory; County Wetland Survey by Draper Aden Association

Site Physiography

Land Cover Analysis

The land cover analysis was manually digitized using 2007 aerial imagery as base information. The land within the study area was place in one of the follow categories: deciduous forest, evergreen forest, mixed forest, pasture or grass, old field, or water.

Topography

Topography is an important factor in most land planning decisions. Consequently, having a topographic survey of the site is essential. The United States Geological Survey (USGS) makes topographic maps at several scales. These maps provide information on biophysical and cultural context of a community or region. Site topography surveys, in contrast, are much larger in scale, and are usually completed by a license land surveyor in accordance with specifications tailored to the program and the site. There are three key attribute maps that can be derived from a topographic survey. These maps geographically depict three fundamental landform components: elevation, slope, and aspect.

Text information for topography and slope analysis was gathered from the following sources:

La Gro, James A. Site Analysis: Linking Program and Concept in Land Planning and Design. New York: John Wiley, copyright 2001.

http://addison.vt.edu/search~S1?/tSite+Analysis%3A+Linking+Program+and+Concept+in+Land+Planning+and+Design/tsite+analysis+linking+program+and+concept+in+land+planning+and+design/1%2C1%2C2%2CB/frameset&FF=tsite+analysis+linking+program+and+concept+in+land+planning+and+design&1%2C%2C2

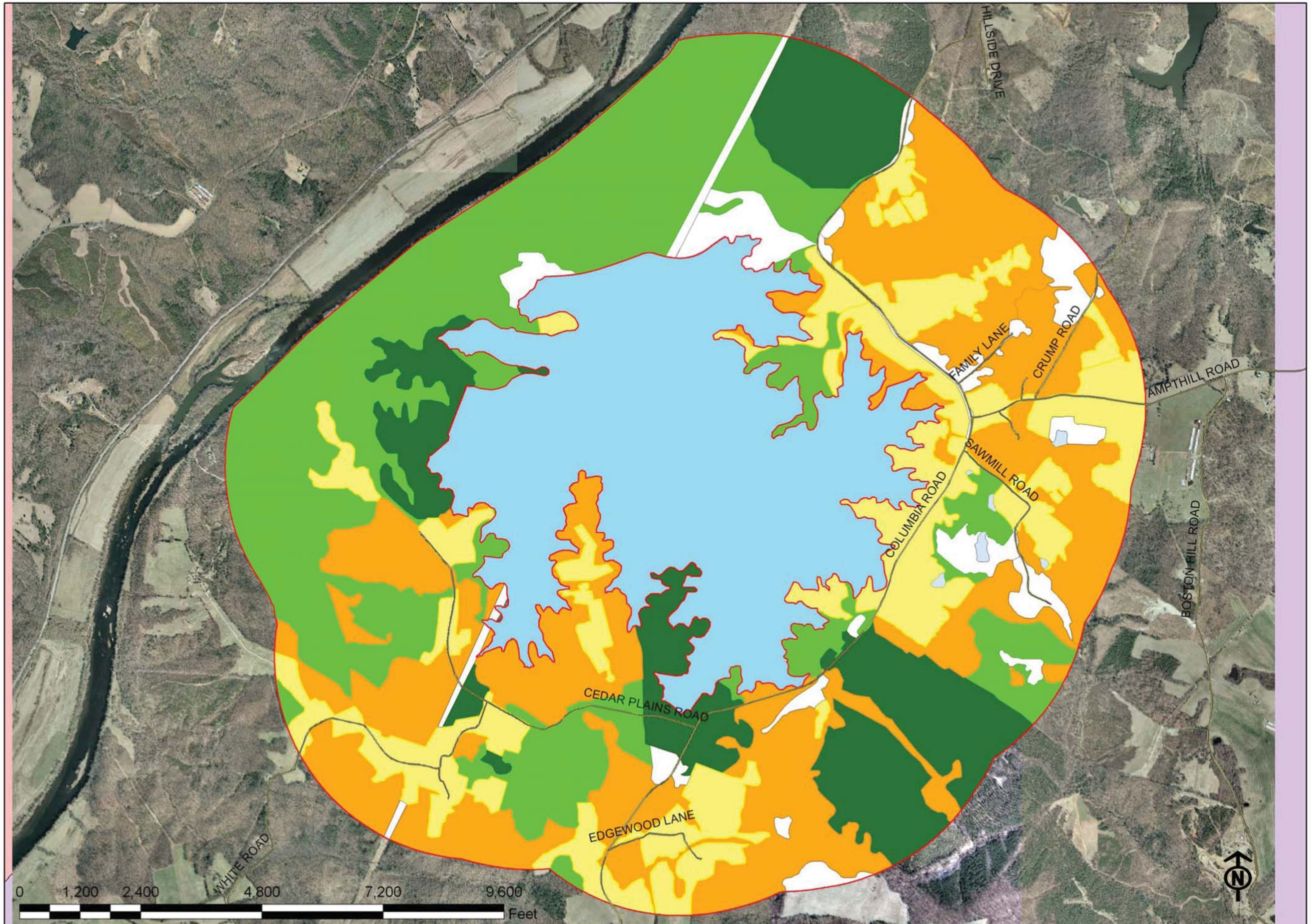
http://www.amazon.com/Site-Analysis-Linking-Program-Planning/dp/0471344125/ref=pd_bbs_sr_2?ie=UTF8&s=books&qid=1229093159&sr=8-2

Slope Analysis

The slopes of the undeveloped site reflect the local area's surface geology, climate, and soils. Differences such as parent materials and weathering account for different landforms, or landscape "signatures." Landforms, and therefore slopes, are the result of constructural processes (i.e. deposition) and destructional processes (i.e. erosion) acting on geological structures.

A site's suitability for roads, walkways, buildings, and other structures is, in part, a function of existing slopes on site. In a location with freezing temperatures, steep slopes are a significant safety concern when designing vehicle and pedestrian circulation systems. Gradients should be relatively low to prevent accidents such as slipping on icy surfaces.

Aspect:
A slope's orientation, or aspect, is simply the direction the slope faces. Aspect is typically identified by compass direction (i.e. north, and northeast). Variation in slope and aspect influence the amount of solar radiation received by the site on a daily and seasonal basis. As with other site attributes, the importance of aspect to project depends on the proposed uses. Aspect influences microclimate by affecting the level of solar radiation that strikes the site.



Cobbs Creek Reservoir Landcover Analysis

Legend

- Roads
- Deciduous Forest
- Evergreen Forest
- Mixed Forest
- Pasture or Grass
- Water
- Old Field
- Reservoir Perimeter
- 4000 Foot Study Area

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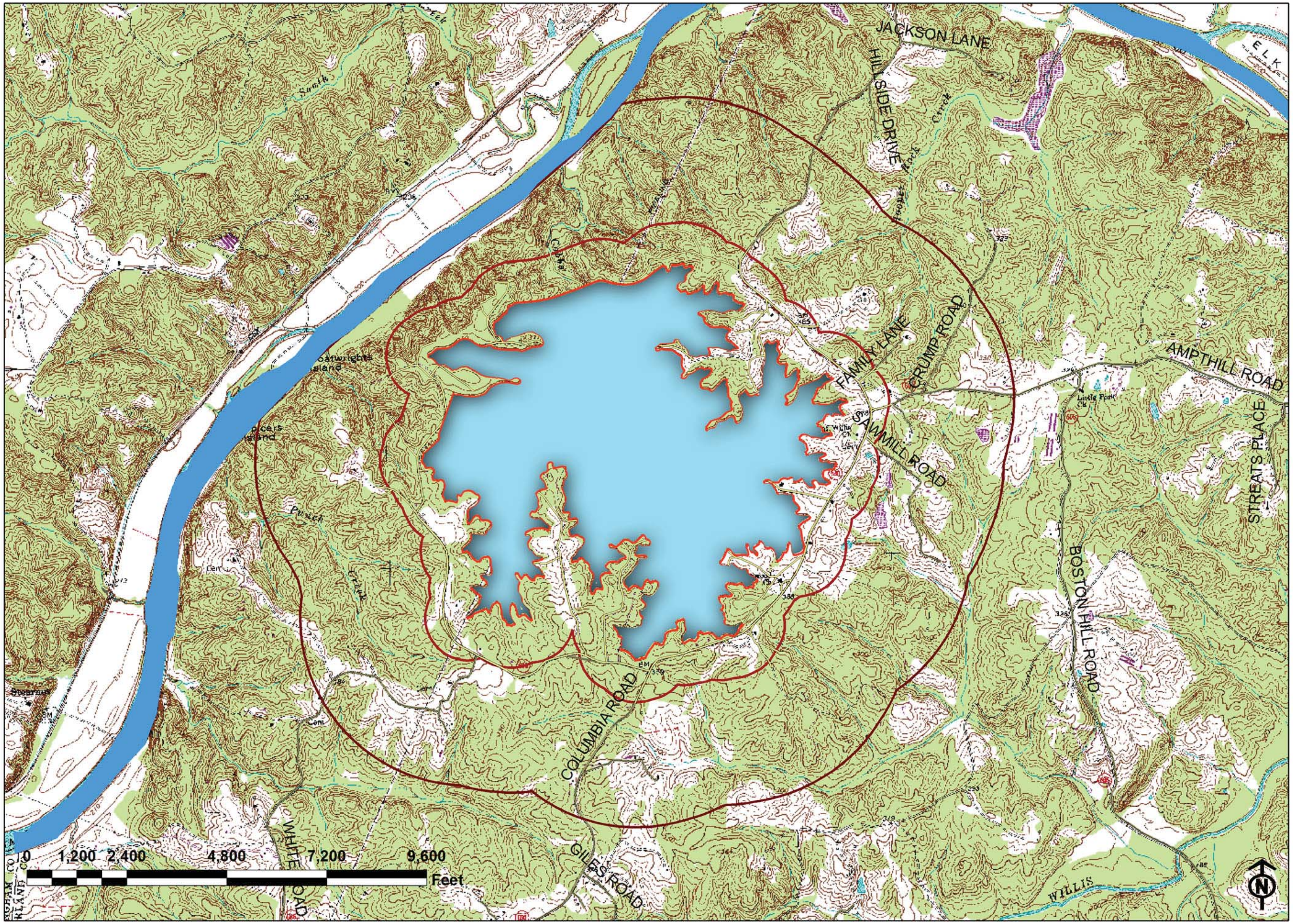

Source: United States Geological Survey

Cobbs Creek Reservoir
Topography Analysis

Legend

- Reservoir Boundary
- 1000 Foot Study Area
- 4000 Foot Study Area
- Major Roads
- James River

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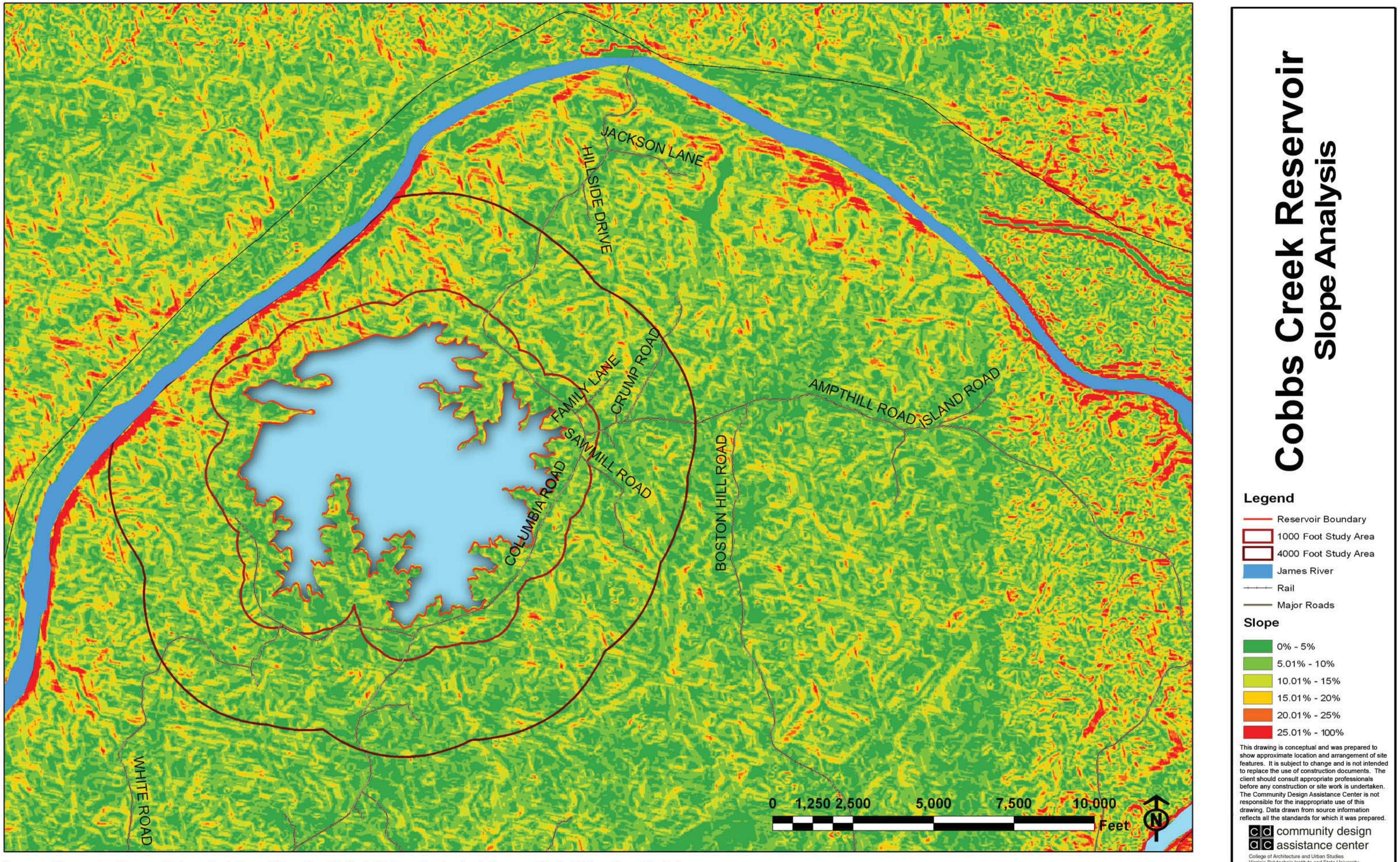


Source: Generated by spatial analyst from 10 meter United States Geological Survey Digital Elevation Model

Area Soils

Soils Inventory

Soils within the study area were documented and mapped using information provided by the Natural Resources Conservation Service. The following table of information and key provide descriptions of the soils portrayed in the maps on pages 26-27.

Legend

soils

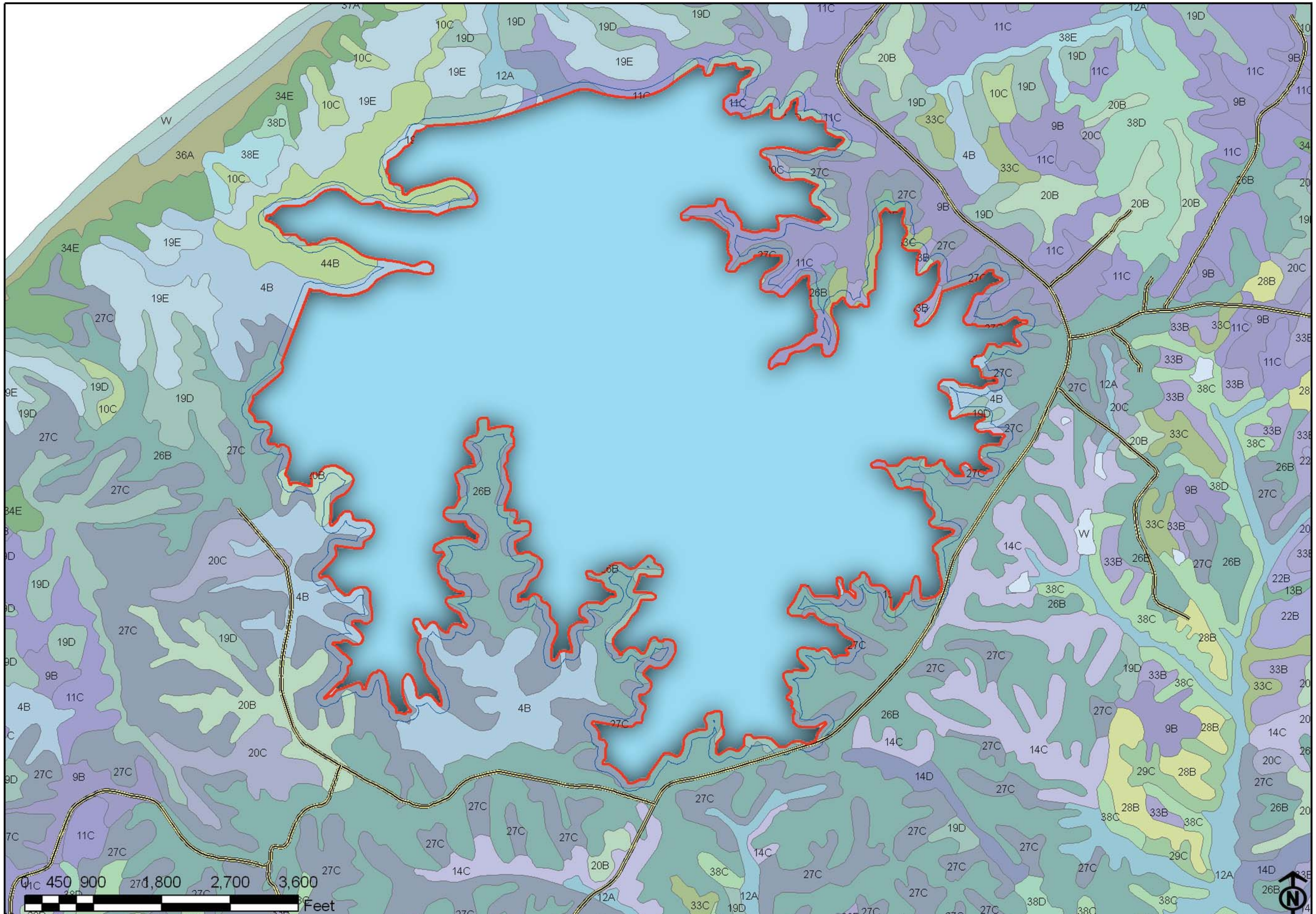
- W Water
- 1B Appling sandy loam
- 2C Appling-Helena complex
- 3B Banister fine sandy loam
- 4B Bentley-Nathalie complex
- 5B Brickhaven-Creedmoor complex
- 5C Brickhaven-Creedmoor complex
- 6B Cecil sandy loam
- 7C Cecil sandy clay loam
- 8A Chewacla and Monacan soils
- 9B Clifford sandy loam
- 10C Clifford sandy loam
- 11C Clifford clay loam
- 12A Codorus loam
- 13B Delila fine sandy loam
- 14C Devotion sandy loam
- 14D Devotion sandy loam
- 15A Dogue fine sandy loam
- 15B Dogue fine sandy loam
- 16B Enon-Helena complex
- 16C Enon-Helena complex
- 16D Enon-Helena complex
- 17B Enon-Helena complex
- 17C Enon-Helena complex
- 18D Enon-Poindexter complex
- 19D Fairview-Devotion complex
- 19E Fairview-Devotion complex
- 20B Halifax sandy loam
- 20C Halifax sandy loam
- 21B Helena sandy loam
- 21C Helena sandy loam
- 22B Jackland-Mirerock complex
- 23B Mattaponi-Appling complex
- 24B Mayodan-Exway complex
- 24C Mayodan-Exway complex
- 25B Mecklenburg loam
- 25C Mecklenburg loam
- 26B Nathalie sandy loam
- 27C Nathalie-Halifax complex
- 28B Oak Level-Diana Mills complex
- 29C Oak Level-Siloam complex
- 29D Oak Level-Siloam complex
- 30D Pacolet-Wateree complex
- 30E Pacolet-Wateree complex
- 31B Pinoka-Carbonton complex
- 31C Pinoka-Carbonton complex
- 31D Pinoka-Carbonton complex
- 32B Poindexter-Wedowee complex
- 32C Poindexter-Wedowee complex
- 32D Poindexter-Wedowee complex
- 32E Poindexter-Wedowee complex
- 33B Rasalo-Halifax complex
- 33C Rasalo-Halifax complex
- 34E Rasalo-Spriggs complex
- 35A Riverview and Tuckahoe soils
- 36A Sindion silt loam
- 37A Speedwell loam
- 38B Spriggs-Toast complex
- 38C Spriggs-Toast complex
- 38D Spriggs-Toast complex
- 38E Spriggs-Toast complex
- 39B Wintergreen loam
- 40A Toccoa fine sandy loam
- 41B Trenholm sandy loam
- 42C Wateree sandy loam
- 42D Wateree sandy loam
- 43A Wehadkee sandy loam
- 44B Wintergreen loam
- 45B Worsham loam

	Depth of Soils	Erosive Degree	Issues
3B	More than 80 inches	ML	HW,
4B	More than 80 inches	ML	HW,
9B	More than 80 inches	M	LW,
10C	More than 80 inches	MH	LW,
11C	More than 80 inches	ML	LW,
12A	More than 80 inches	ML	WS, HW, FF
13B	More than 80 inches	ML	WS, HW,
14C	20 to 40 inches to paralithic bedrock, 40 to 60 inches to lithic bedrock	M	WS, LW
14D	20 to 40 inches to paralithic bedrock, 40 to 60 inches to lithic bedrock	M	SS, LW,
19D	More than 80 inches	MH	SS, LW,
19E	More than 80 inches	MH	SS, LW,
20B	More than 80 inches	ML	HW,
20C	More than 80 inches	MH	HW,
22B	More than 80 inches of Jackland	M	HW,
	20 to 40 inches of Mirerock to paralithic bedrock		LW,
26B	More than 80 inches	ML	LW,
27C	More than 80 inches of Nathalie	ML	WS, LW
	More than 80 inches of Halifax		HW,
28B	More than 80 inches of Oak Level	M	LW,
	40 to 60 inches of Diana Mills to paralithic bedrock		LW,
29C	More than 80 inches of Oak Level	M	LW,
	10 to 20 inches to paralithic bedrock; 20 to 40 inches to lithic rock of Siloam		LW,
33B	More than 80 inches of Rasalo	ML	LW,
	More than 80 inches of of Halifax		HW,
33C	More than 80 inches of Rasalo	MH	LW,
	More than 80 inches of of Halifax		HW,
34E	More than 80 inches of Rasalo	MH	SS, LW,
	20 to 40 inches to paralithic baedrock of Spriggs		SS, LW,
36A	More than 80 inches	GC	HW, FF
37A	More than 80 inches	GC	WS, LW, FF
38B	20 to 40 inches to paralithic bedrock of Spriggs	GC	LW,
	More than 80 inches of Toast		LW,
38C	20 to 40 inches to paralithic bedrock of Spriggs	M	LW,
	More than 80 inches of Toast		LW,
38D	20 to 40 inches to paralithic bedrock of Spriggs	M to MH	SS, LW,
	More than 80 inches of Toast		SS, LW,
38E	20 to 40 inches to paralithic bedrock of Spriggs	MH	SS, LW,
	More than 80 inches of Toast		SS, LW,
44B	More than 80 inches	MH	LW,
Water			

Source: Natural Resources Conservation Service

Key:
M=Moderate
ML= Moderately Low
MH=Moderately High
GC=Good for Construction
WS=Wetland Soil
ES=Erosive Soil
HW=High Water Table
LW=Low Water Table
BS=Bad for Septic
FF=Subject to Flash Floods
SS=Steep Slopes

Cobbs Creek Reservoir Soil Analysis



Source: Natural Resources Conservation Service

Legend

- 1000 Foot Study Area
- Reservoir 100 Foot Buffer
- Reservoir Boundary
- Roads

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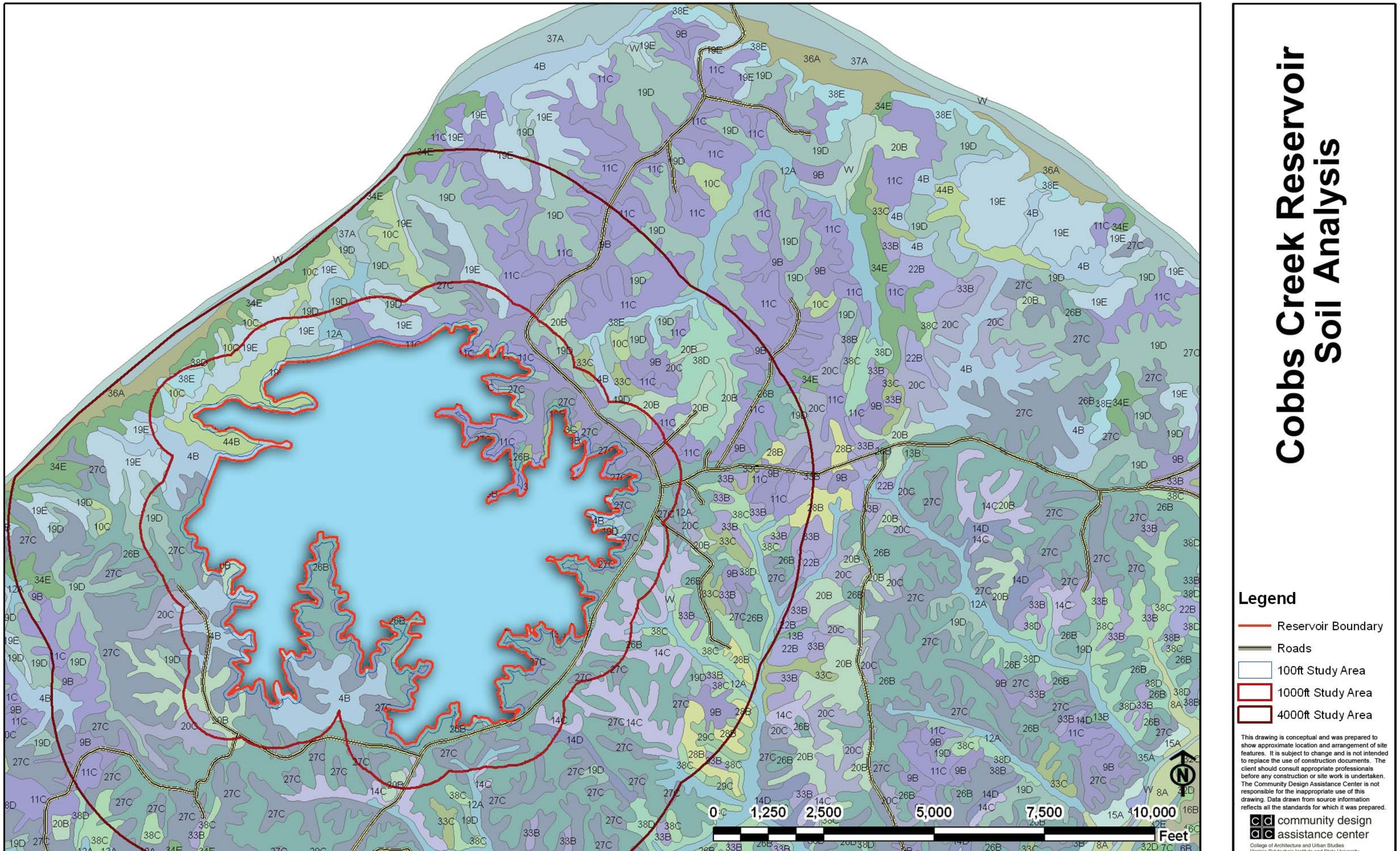


Source: Natural Resources Conservation Service

Soil Suitability Analysis

Soils surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of soils in the survey areas.

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The information on the following maps as well as the following text descriptions were created by the National Cooperative Soil Survey, which is a joint effort of the United States Department of Agriculture and other Federal agencies, state agencies including Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

The ratings shown on the maps on the following pages indicate the extent to which the soils are limited by all of the soil features that affect building site development.

> **Not limited** (green) indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected.
>
> **Somewhat limited** (yellow) indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected.
>
> **Very limited** (red) indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

The information is not site specific and does not eliminate the need for on-site investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Detailed tables and additional descriptions for each map category can be found in the full soils report that accompanies this site analysis document.

Text information for soil suitability analysis was taken from the soil report created by the National Cooperative Soil Survey.

Building and Site Development

Soil properties influence the development of building sites, including the selection of the site, the design of the structure, construction, performance after construction, and maintenance.

Information provided in the soils mapping and associated tables (see appendix a) is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil between the surface and a depth of 5 to 7 feet. Because of the map scale, small areas of different soils may be included within the mapped areas because of a specific soil.

Shallow Excavations

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for graves, utility lines, open ditches, or other purposes. The ratings are based on the soil properties that influence the ease of digging and the resistance to sloughing. Depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, the amount of large stones, and dense layers influence the ease of digging, filling, and compacting. Depth to the seasonal high water table, flooding, and ponding may restrict the period when excavations can be made. Slope influences the ease of using machinery. Soil texture, depth to the water table, and linear extensibility (shrink-swell potential) influence the resistance to sloughing.

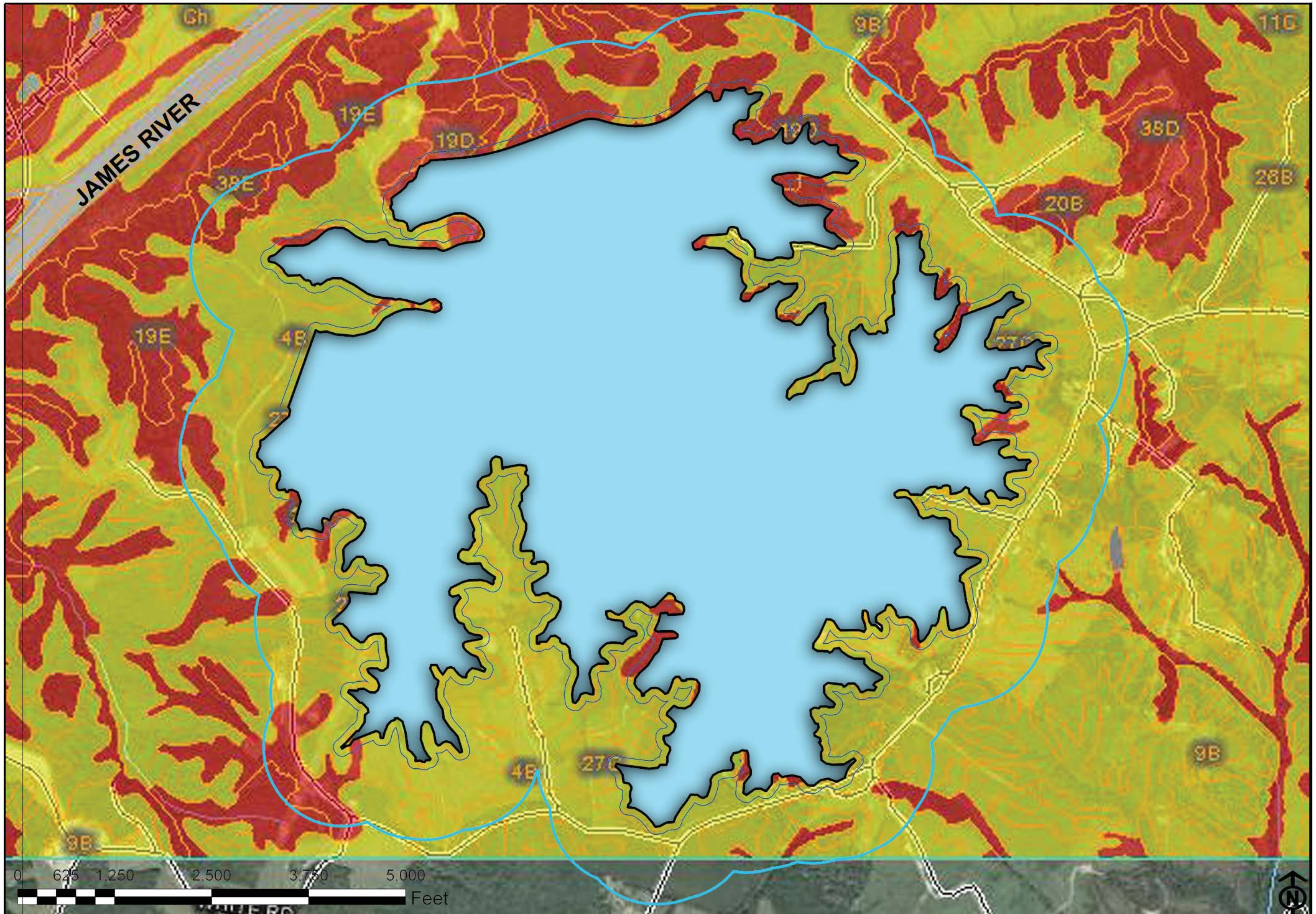
Lawns and Landscaping

Lawns and landscaping require soils on which turf and ornamental trees and shrubs can be established and maintained. Irrigation is not considered in the ratings. The ratings are based on soil properties that affect plant growth and trafficability after vegetation is established. The properties that affect plant growth are reaction; depth to water table; ponding; depth to bedrock or a cemented pan; the available water capacity in the upper 40 inches; the content of salts, sodium, or calcium carbonate; and sulfidic materials. The properties that affect trafficability are flooding, depth to a water table, ponding, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer.

Dwellings

Dwellings are single-family houses of three stories or less. For dwellings without basements, the foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of 2 feet or at the depth of maximum frost penetration, whichever is deeper. For dwellings with basements, the foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of about 7 feet.

The ratings for dwellings are based on the soil properties that affect the capacity of the soil to support a load without movement and on the properties that affect excavation and construction costs. The properties that affect the load-supporting capacity include depth to a water table, ponding, flooding, subsidence, linear extensibility (shrink-swell potential), and compressibility. Compressibility is inferred from the Unified classification of the soil. The properties that affect the ease and amount of excavation include depth to a water table, ponding, flooding, slope, depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, and the amount and size of rock fragments.



Cobbs Creek Reservoir
Soil Analysis for Shallow Excavations

Legend

- Reservoir Boundry
- Reservoir 100 Foot Buffer
- 1000 Foot Study Area
- Most Limiting
- Some Limitation
- Most Suitable

This drawing is conceptual and was prepared to show approximate location and arrangement of site features. It is subject to change and is not intended to replace the use of construction documents. The client should consult appropriate professionals before any construction or site work is undertaken. The Community Design Assistance Center is not responsible for the inappropriate use of this drawing. Data drawn from source information reflects all the standards for which it was prepared.

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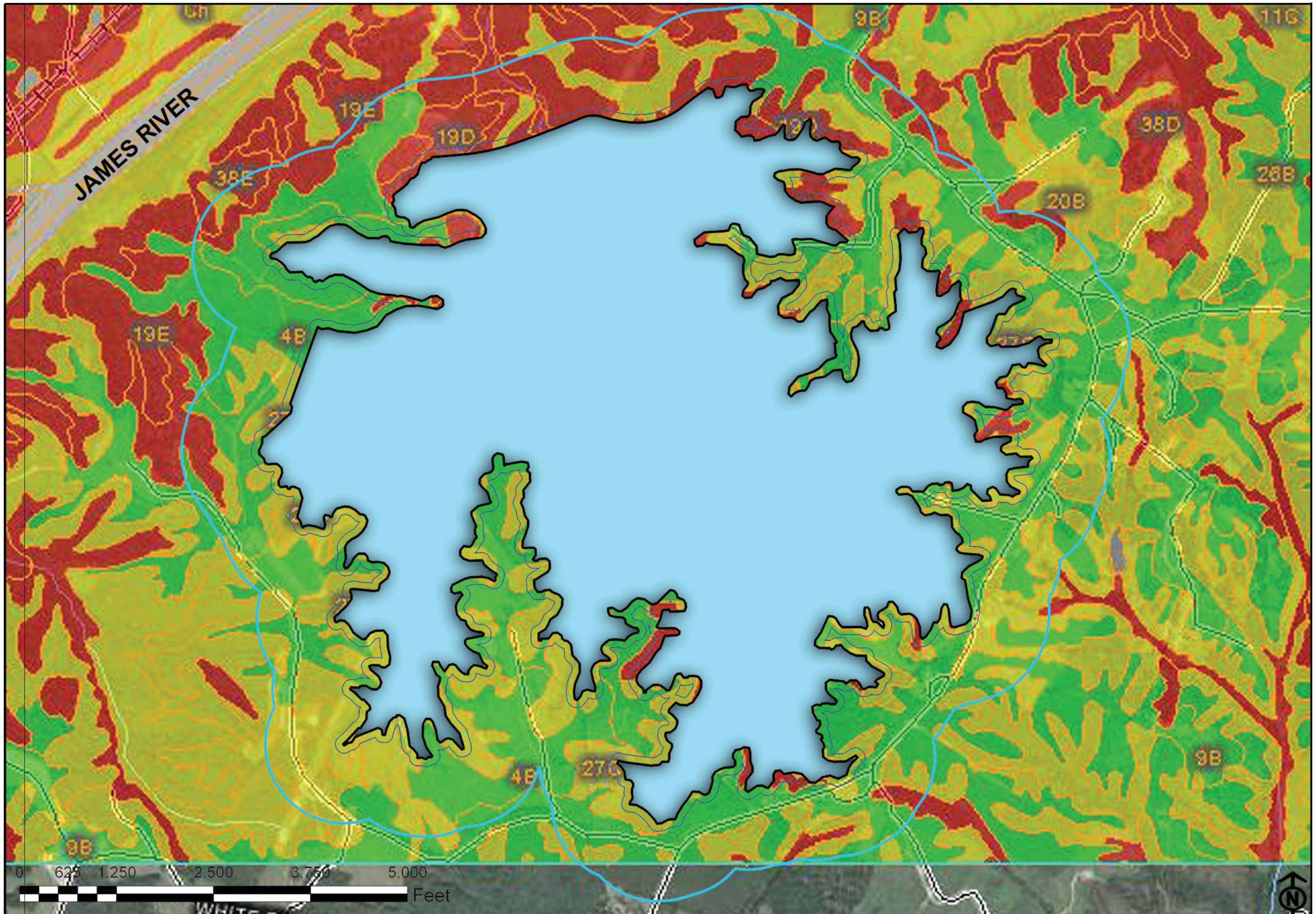
Source: Natural Resources Conservation Service



Cobbs Creek Reservoir
Soil Analysis for Lawns & Fairways

Legend

- Reservoir Boundry
- Reservoir 100 Foot Buffer
- 1000 Foot Study Area
- Most Limiting
- Some Limitation
- Most Suitable

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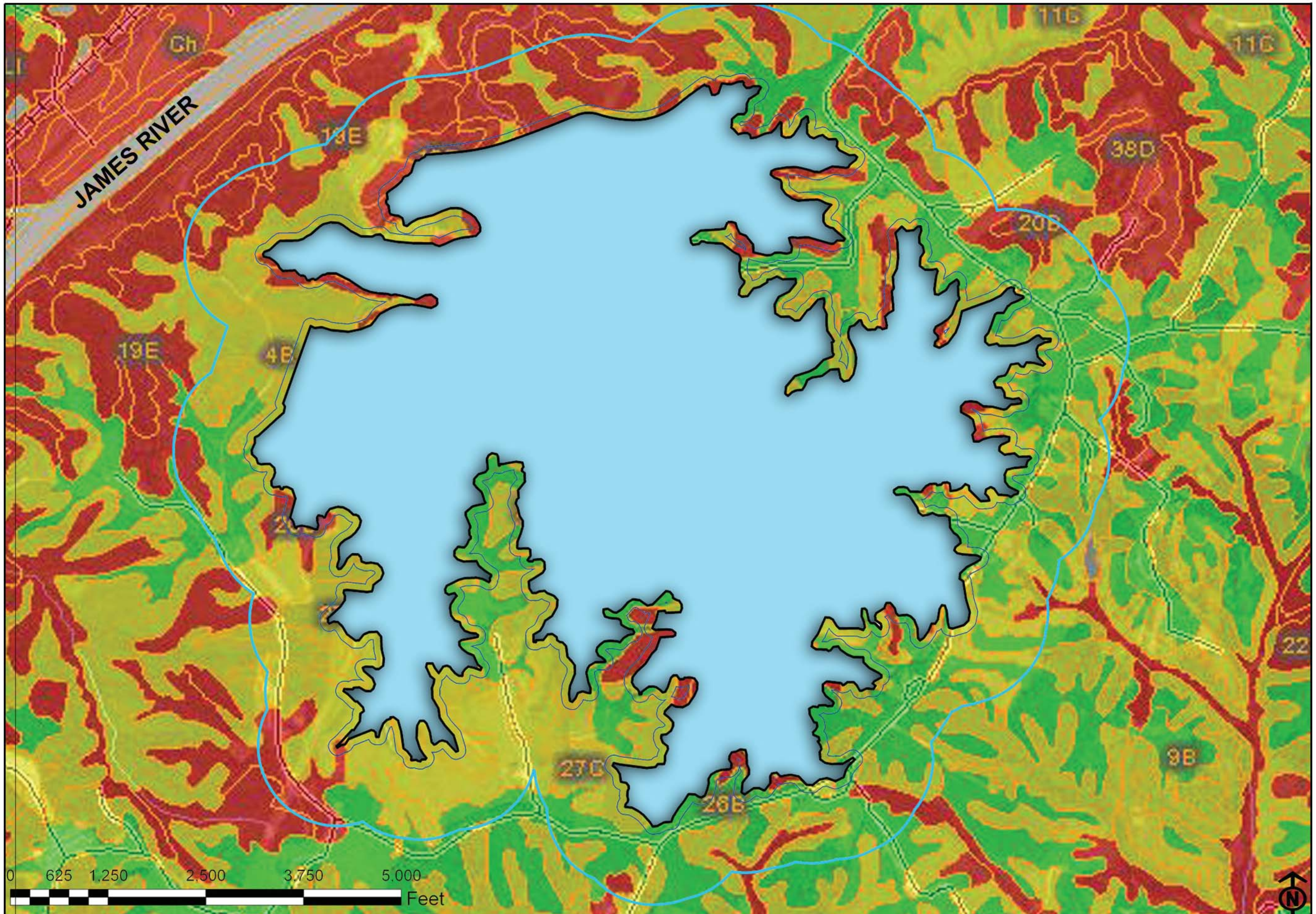
Source: Natural Resources Conservation Service



Cobbs Creek Reservoir
Soil Analysis for Dwellings

Legend

- Reservoir Boundry
- Reservoir 100 Foot Buffer
- 1000 Foot Study Area
- Most Limiting
- Some Limitation
- Most Suitable

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Source: Natural Resources Conservation Service

Recreational Development

The ratings for camp areas, picnic areas, playgrounds are based on the soil properties that affect the ease of development of each proposed use and that influence the trafficability and the growth of vegetation after development. The soil properties that influence trafficability are texture of the surface layer, depth to a water table, ponding, flooding, saturated hydraulic conductivity (Ksat), and large stones. For good trafficability, the surface of camp areas, picnic areas, playgrounds, and trails should absorb rainfall readily, remain firm under heavy foot traffic, and not by dusty when dry.

The soil properties that affect the growth of plants are depth to bedrock or a cemented pan, Ksat, and toxic substances in the soil.

Camp Areas

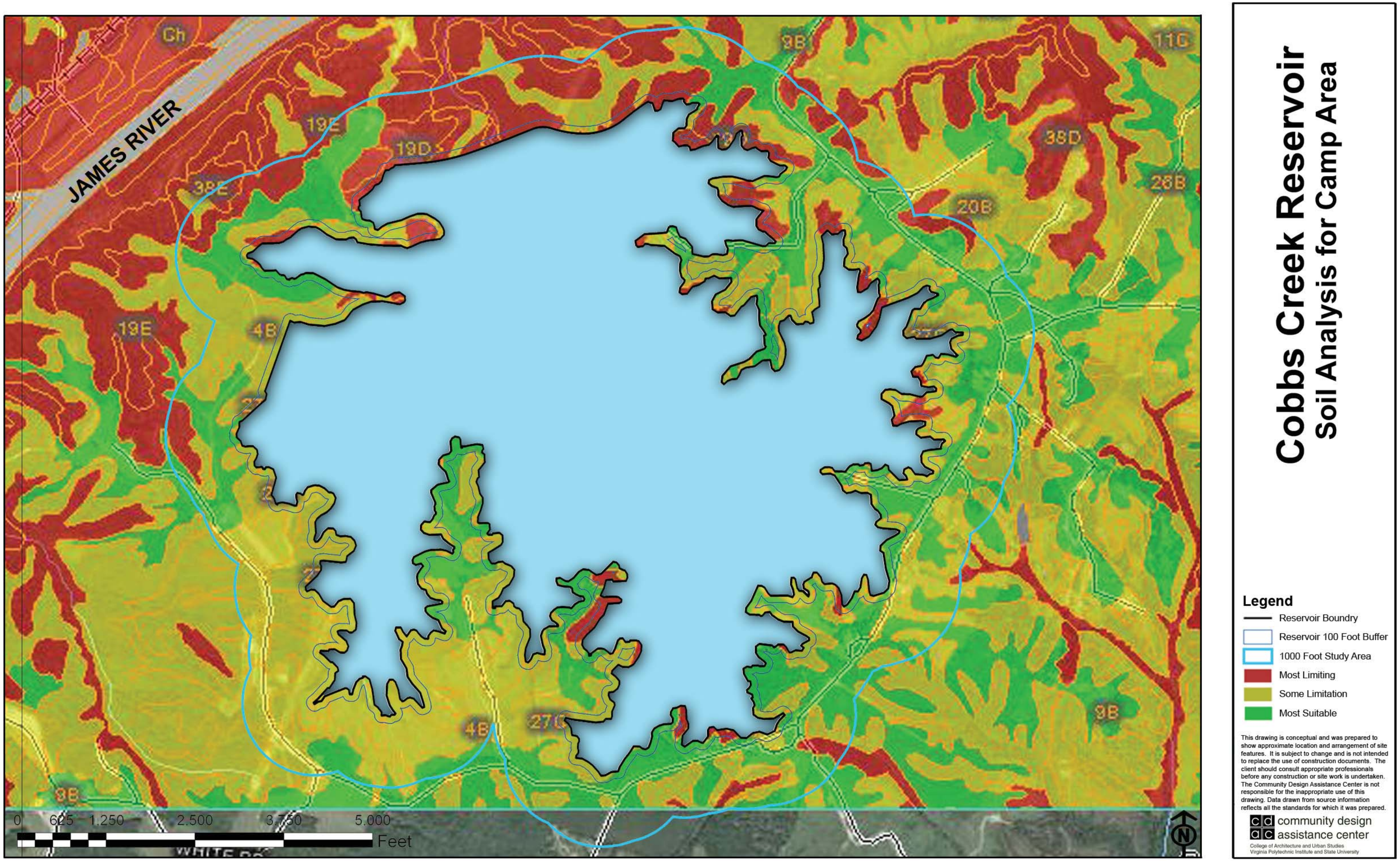
Camp areas require site preparation, such as shaping and leveling the tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary vehicular traffic. Slope, stoniness, and depth to bedrock or a cemented pan are the main concerns affecting development of camp areas.

Playgrounds

Playgrounds require soils that are nearly level, are free of stones, and can withstand intensive foot traffic. Slope and stoniness are the main concerns affecting the development of playgrounds.

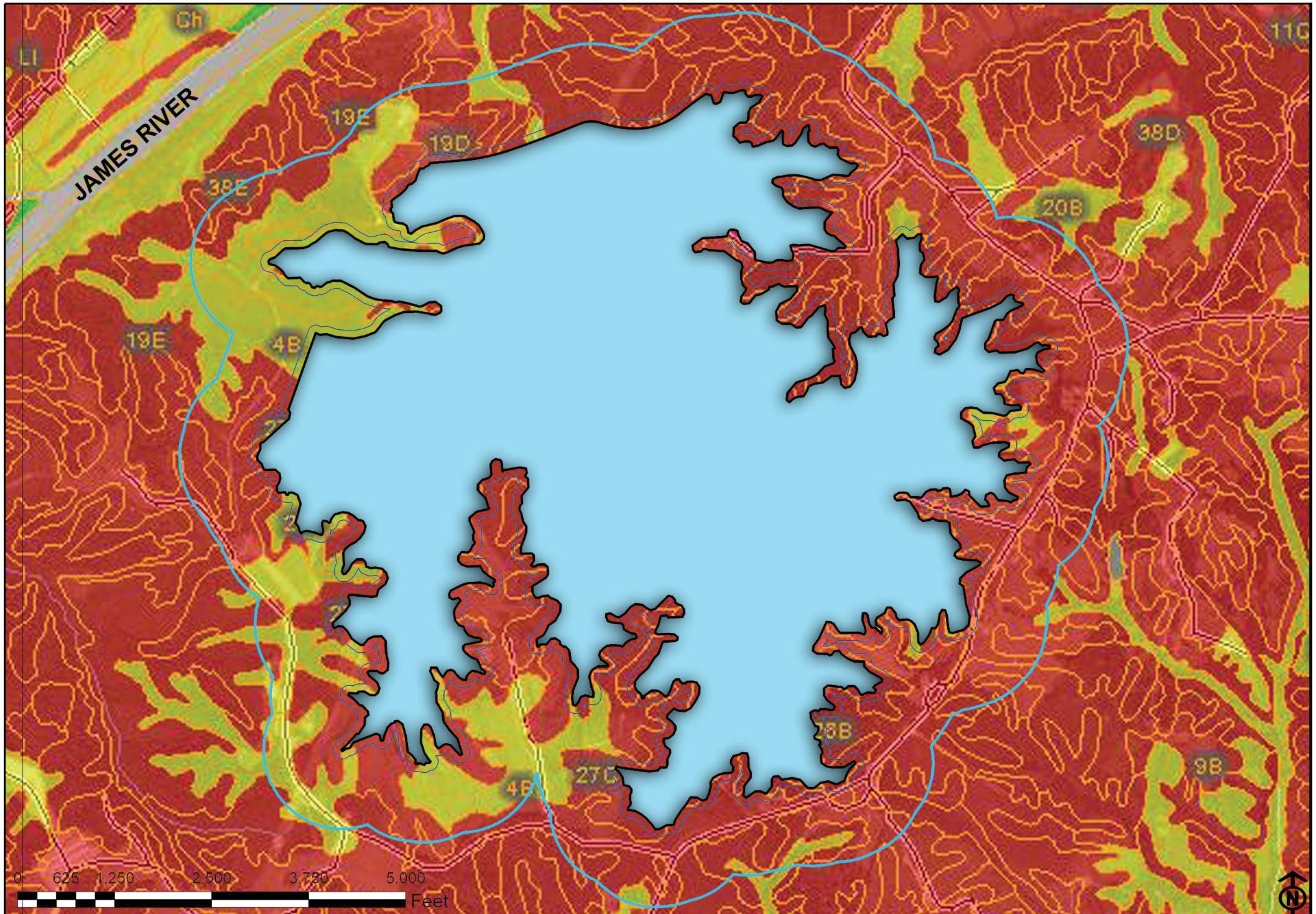
Paths and Trails

The ratings for paths and trails are based on soil properties that affect trafficability and erodibility. These properties include stoniness, depth to a water table, ponding, flooding, slope, and texture of the surface layer. Not considered in the ratings for paths and trails, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewer lines (public restrooms). Soils that are subject to flooding are limited for recreational uses by the duration and intensity of flooding and the season when flooding occurs. In planning recreational facilities, on-site assessment of height, duration, intensity, and frequency of flooding is essential. Paths and trails for hiking and horseback riding should require little or not slope modification through cutting and filling.



Source: Natural Resources Conservation Service

Cobbs Creek Reservoir
Soil Analysis for Playgrounds



Legend

- Reservoir Boundry
- Reservoir 100 Foot Buffer
- 1000 Foot Study Area
- Most Limiting
- Some Limitation
- Most Suitable

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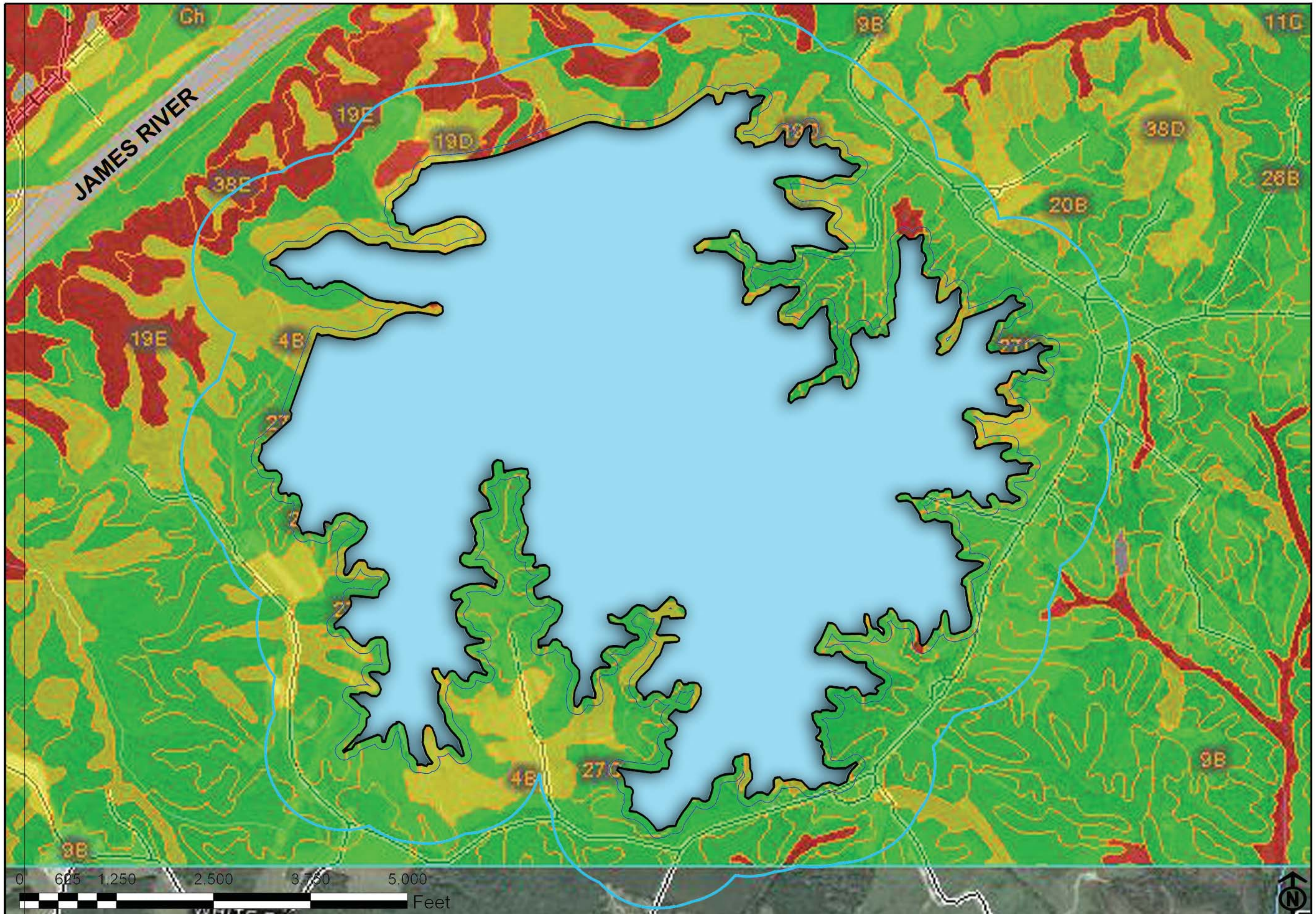
Source: Natural Resources Conservation Service



Cobbs Creek Reservoir
Soil Analysis for Paths & Trails

Legend

- Reservoir Boundry
- Reservoir 100 Foot Buffer
- 1000 Foot Study Area
- Most Limiting
- Some Limitation
- Most Suitable

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Source: Natural Resources Conservation Service

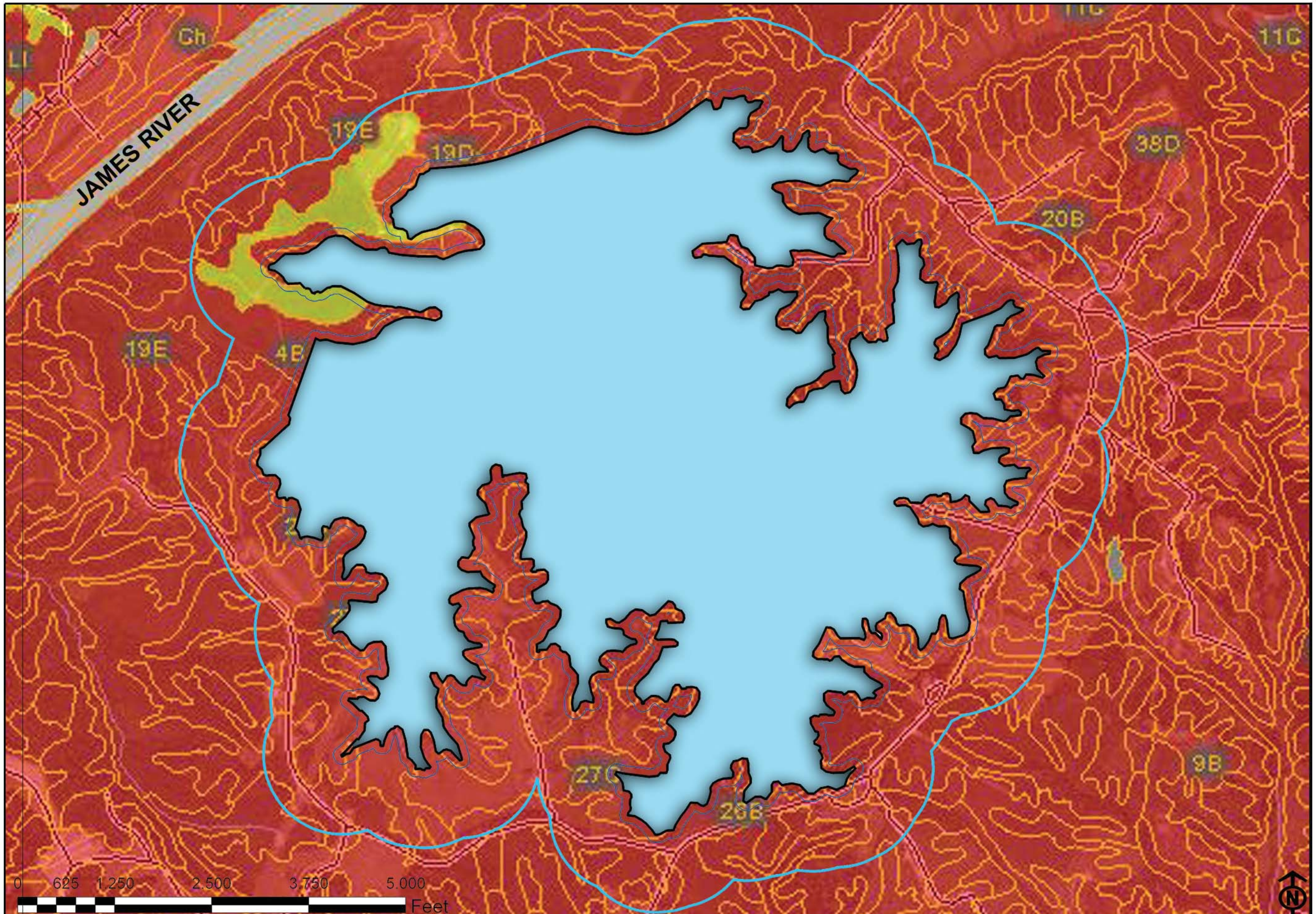
Sewage Disposal

Septic Tank Absorption Fields

Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 72 inches or between a depth of 24 inches and a restrictive layer is evaluated. The ratings are based on the soil properties that affect absorption of the effluent, construction and maintenance of the system, and public health. Saturated hydraulic conductivity (Ksat), depth to a water table, ponding, depth to bedrock or a cemented pan, and flooding affect absorption of the effluent. Stones and boulders, ice, and bedrock or a cemented pan interfere with installation. Subsidence interferes with installation and maintenance. Excessive slopes may cause lateral seepage and surfacing of the effluent in downslope areas.

Some soils are underlain by loose sand and gravel or fractured bedrock at a depth of less than 4 feet below the distribution lines. In these soils the absorption field may not adequately filter the effluent, particularly when the system is new. As a result, the ground water may become contaminated.

Cobbs Creek Reservoir
Soil Analysis for Septic



Legend

- Reservoir Boundry
- Reservoir 100 Foot Buffer
- 1000 Foot Study Area
- Most Limiting
- Some Limitation
- Most Suitable

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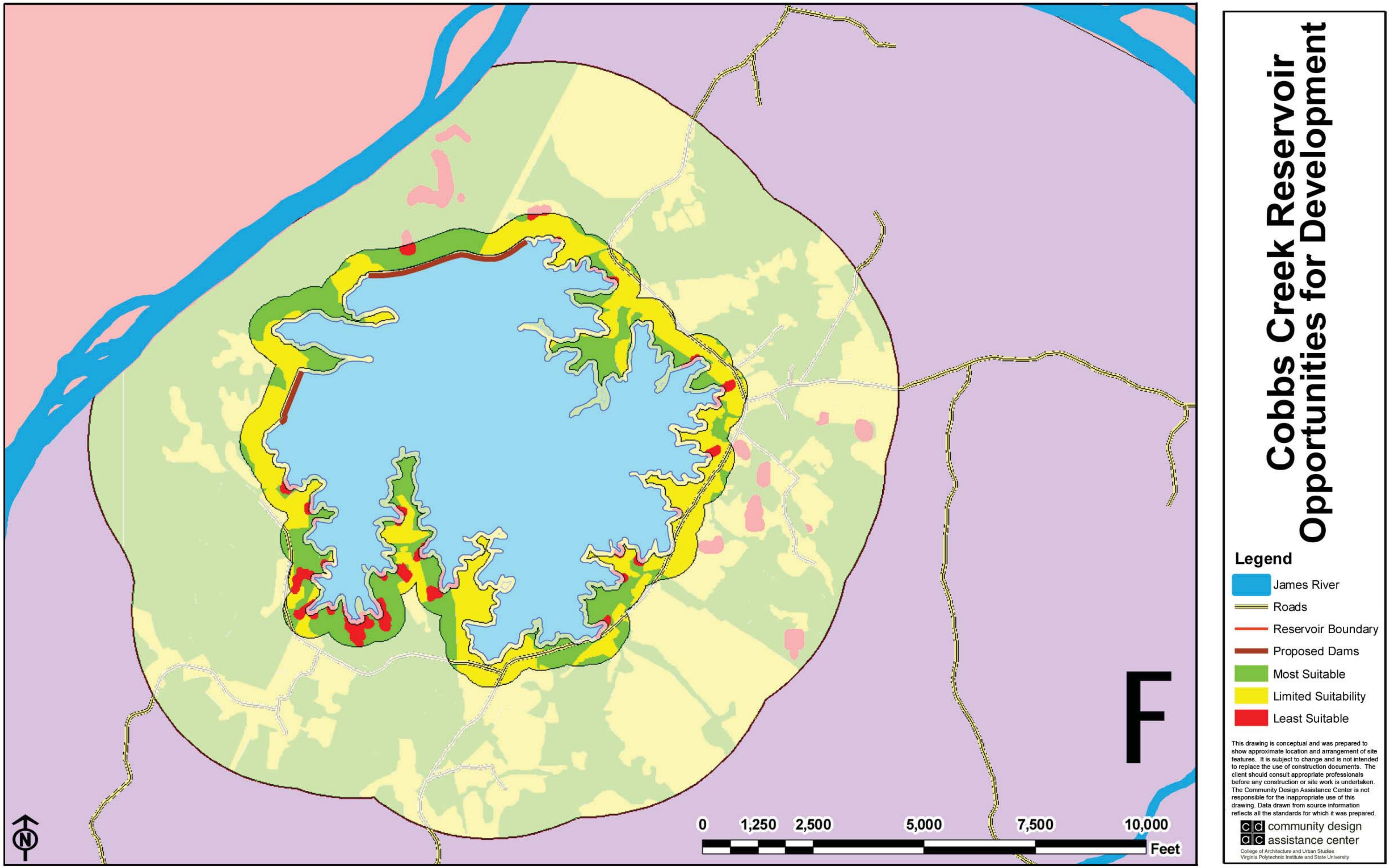
Source: Natural Resources Conservation Service

Summary of Findings

Using the land cover and wetland data, the CDAC team developed a model to highlight areas of opportunities and constraints as it relates to future potential development. The map presented on page 40 summaries these findings in graphic form. The primary area of interest was a 500 foot zone from the edge of the buffer zone outward. Areas colored in green represent areas favorable for development. Areas colored in yellow represent less favorable development areas. Areas colored in red are those places that should likely not be developed. Red areas are within 50 feet of wetlands.

This map was created with 1.5 acre lots with dwellings primarily in mind. Within this category there are a number of areas that could also be investigated on-site for potential commercial development. Commercial development envisioned is cluster, multi-family development. There may be archeological sites that have not been investigated or included in this model. Additional site-specific assessment may be necessary.

Pipeline realignment should be at least 1500 feet from the reservoir. A thorough economic impact study of the realignment should be conducted. The utility easement corridor created by the realignment should be appropriately screened.



Source: Manual Digitization of Land Cover from Aerial Imagery, Wetland Location from Cumberland County