

## Lakes Conditions 101

October 25, 2018

This document provides an overview of key facts and existing conditions on Lakes Tuscaloosa, Nicol and Harris, and the land surrounding these water bodies. It is intended to provide a base of facts for the Lakes subcommittee to consider.

### CONTEXT AND HISTORY

The City of Tuscaloosa owns and operates Lake Tuscaloosa, Lake Nicol, and Harris Lake for the purpose of drinking water and industrial raw water supply. Protection of these valuable natural resources is critical to the public health and welfare of the community and continued economic growth of the region.

Lake Tuscaloosa was completed in 1970 and is the primary source of drinking water for the Tuscaloosa metropolitan area. The lake was created by damming the North River and is 5,885 acres in size. Forty billion gallons of water provides the area with a valuable recreation, industrial and human needs resource. Lake Tuscaloosa is renowned in the area for its year-round fishing and boating culture (City of Tuscaloosa, 2018).

Lake Nicol was completed in 1956 and now serves as a backup for Lake Tuscaloosa. It is 384 acres in size and holds approximately 3.3 billion gallons of water. In addition to canoeing and swimming, Lake Nicol boasts a well-maintained park (City of Tuscaloosa, 2018). Harris Lake was completed in 1929 and serves the Tuscaloosa area as a source for industrial water use and hydroelectric power generation. The lake is 220 acres in size and holds approximately 1 billion gallons of water.

### Jurisdictions and authority

While the city owns the three lakes, its jurisdiction over the land surrounding these lakes varies. The land immediately surrounding lakes Nicol and Harris is within Tuscaloosa's city limits and is subject to city zoning regulations. Surrounding Lake Tuscaloosa, the city owns all land within the 50-year floodplain of the lake, which is defined approximately as the 230-foot elevation line. This line of city property is also known as the Acquisition Line. However, much of the land adjacent to Lake Tuscaloosa beyond the 230-foot elevation line is outside of city limits in unincorporated portions of Tuscaloosa County. There is no zoning in the unincorporated areas, but the area within the "planning jurisdiction" (shown on Map 1) is subject to the city's subdivision review.

## LAND USE AND PHYSICAL CONDITIONS

### Watersheds

A watershed is an area of land that drains all the streams and rainfall to a common outlet such as the outflow of a reservoir, mouth of a bay, or any point along a stream channel. The watershed consists of surface water—lakes, streams, reservoirs, and wetlands—and all the underlying ground water (USGS, 2016). Map 2 depicts the watersheds of Lake Tuscaloosa (North River) and Lake Nicol and Harris Lake (Yellow Creek). Surface and ground water within these areas eventually flows into the lakes before draining into the Black Warrior River. Land use conditions in the watersheds have a direct impact on the water quality of the lakes.

### Flood Hazards

Flood-prone land surrounding the lakes is limited to areas very near the shorelines or adjacent to streams that flow into the lakes. Map 3 depicts areas with a 1% annual chance of flooding (sometimes referred to as the 100-year or base flood). Development is not prohibited within flood hazard areas but is often more costly due to increased engineering permit requirements. Buildings constructed in these areas are required to have their ground floor at least two (2) feet above the base flood elevation within the city and one foot elsewhere in the county.

### Slopes

The topography of the lakes watersheds is fairly gentle, with the exception of some moderately steep areas along the edges of the lakes. Map 4 indicates areas with potentially steep slopes. These slopes are typically wooded and offer scenic qualities that make attractive residential development sites. These areas are also important for the health of the watersheds. Disturbing steep slopes can have negative environmental impacts including water pollution from increased erosion and surface water runoff, increased risk of downstream flooding, and loss of habitat.

Development on steep slopes is also more costly for developers, property owners and public entities due to additional building and site engineering required, greater installation and maintenance of infrastructure (roads, utilities), water treatment from pollution and sedimentation, and potential increase in public safety costs.

### Stormwater and Pollution

During heavy rain events, the rain drops flow together (creating stormwater flow) and pick up pesticides, fertilizer, oil and grease, pet waste, gravel and sediment, litter and other dissolved chemicals as it flows across grass and/or pavement. If flow is slowed, the water is absorbed into soil and can filter and replenish groundwater. In a heavy rain event, or when stormwater flow is high and not absorbed, the excess water flows into a storm drain and a network of pipes that lead to a ditch, stream, river, or lake.

*All storm drains lead to local bodies of water.*

To protect local and natural resources, the City of Tuscaloosa, construction companies, industries, and others, use stormwater controls, known as best management practices (BMPs). These BMPs filter out pollutants and/or prevent pollution by controlling it at its source.

To comply with the Federal Clean Water Act, the City of Tuscaloosa implements a stormwater management plan (SWMP) to reduce discharge of pollutants into local waterways. This program consists of:

- Promoting Low Impact Development / green infrastructure
- Educating the public about stormwater pollution
- Identifying illicit discharges through mapping and inspections
- Inspecting construction sites to ensure compliance with erosion control methods
- Continually evaluating the City's SWMP with annual reports

### Low Impact Development

Low impact development (LID) is a design approach for managing stormwater runoff. It emphasizes conservation and the use of on-site natural features to protect water quality. The City has been recognized as a leader in the state for LID implementation. The City of Tuscaloosa has permitted over 200 LID sites since April 27, 2011.

[www.tuscaloosa.com/stormwater/](http://www.tuscaloosa.com/stormwater/)

Many local governments regulate development on steep slopes through zoning and subdivision ordinances. The City of Northport's 2012 zoning ordinance restricts development on slopes of 30% or greater, while some communities impose restrictions on slopes in excess of 10% or 15%. The City of Tuscaloosa does not currently have specific steep slope restrictions, but the subdivision regulations state that "Every effort should be made to avoid the disturbance of steep wooded ravines." The city does encourage "low impact development" practices as part of its Stormwater Management Plan (see sidebar).

### **Water quality**

With current development trends changing land use around the lakes come concerns about degradation of water quality due to erosion (turbidity and sediment from construction sites); wash-off of nutrients (lawn fertilizer); and increase in E. coli bacteria from any deficient septic tank systems.

The City monitors 26 water quality parameters at 34 locations on a monthly basis within the Lake Tuscaloosa, Lake Nicol, and Harris Lake watersheds. Currently the water quality meets or exceeds standards. The 2001 Watershed Protection Plan recommended that a long-term water quality monitoring program be established, but it has not been implemented.

The Alabama Department of Environmental Management performed water quality monitoring on Lake Tuscaloosa during the following years: 1998, 2002, 2003, 2006, 2007, 2011 and 2012. Based on the 2012 results compared with previous sampling events, the water quality remains very good, and there does not appear to be a trend that would suggest a degradation of water quality. The State of Alabama Department of Public Health has Lake Tuscaloosa and Binion Creek (a tributary to Lake Tuscaloosa) on the advisory list for fish consumption due to mercury.

### **Utilities**

Much of the land within Tuscaloosa's city limits is served by public water and sewer infrastructure. Map 5 indicates the City's water utility service area, which is the area that can be served by existing infrastructure (some sites within this area may not currently utilize these utilities). The area of existing sewer service is smaller and covers major developed subdivisions within the city. Beyond this area, private well and septic systems provide drinking water and manage wastewater.

## Existing Land Use

Map 6 depicts existing land use of parcels within the area. Each parcel is classified based on the predominant land use based on data from the Tuscaloosa County Tax Assessor and limited field verification. The following points considers land shown on the map within the entire area north of the Black Warrior River.

Key observations include:

- **Undeveloped land** Approximately 21,000 acres in the area the area is classified as Undeveloped Land by the Tax Assessor's Office. Approximately 4,800 acres is within or adjacent to the city's existing water service area.
- **Working land** Approximately 12,000 acres is classified as classified either agricultural (farmland or pasture), timberland (for timber harvesting), or mining activities. As land values increase, some of these areas may become attractive to development.
- **Most developed land is residential.** There is very limited non-residential development apart from a small neighborhood retail and office node at the intersection of New Watermelon Road and Rice Mine Road. Institutional uses consist primarily of school sites.
- **Many subdivisions are only partially built-out.** There are approximately 1,000 parcels totaling 1,110 acres classified as "Residential Lot" which do not have buildings. Many off these lots are within developing subdivisions and will be utilized eventually, while a small portion of this classification represents sites that are undevelopable due to access or other physical constraints.
- **Protected land surrounds Lakes Nicol and Harris.** There is approximately 1,900 acres of protected land owned by the City of Tuscaloosa adjacent to and surrounding Lake Nicol and Harris Lake.

### Existing Land Use vs Zoning.

Existing Land use identifies how a property is currently being utilized, based on parcel data from the Tuscaloosa County Tax Assessor and limited field verification. Parcels are mapped based on their predominant land use.

Zoning regulates land use including types of structures that may be built, how they are to be built, where they are to be built and how they may be used. All properties within the City of Tuscaloosa have a zoning classification. The existing land use does not necessarily reflect current zoning. There is no zoning in unincorporated areas of the County.

## Recent Development

Map 7 depicts the location of subdivisions approved since 2016. In the area shown, there were 76 subdivisions approved with a total of 483 lots totaling 2,185 acres. The largest new subdivision contained 94 lots. Approximately 1,930 acres of thare outside of the city limits.

## EXISTING POLICY OVERVIEW

The following is a summary of existing policies and regulations pertaining to the lakes and surrounding land.

### Within the city's acquisition line of Lake Tuscaloosa

The city requires that all property owners wishing to clear any property (of trees larger than 3 inches in diameter) or install any structure (such as a dock, pier, etc) within the city's Acquisition Line (230' elevation contour) of Lake Tuscaloosa must obtain a permit from the city.



### Minor subdivisions

Minor subdivisions are not permitted on lakefront lots on Lake Tuscaloosa. A minor subdivision is defined a subdivision of land into not more than three lots; or a reduction of the number of lots in an existing subdivision in the corporate limits; or the subdivision of land into not more than six (6) lots or a reduction of the number of lots in an existing subdivision in the planning jurisdiction. A minor subdivision shall not require any public improvements, the dedication of public way, or the expenditure of any funds, and the plan for the minor subdivision shall not conflict with the master plan, official zoning map, any zoning ordinance, or any other subdivision regulations.

### Erosion Control

Within the city limits, an individual or a developer who owns or controls more than 10 acres of land within one subwatershed and who is subdividing all or part of such acreage must ensure that the existing streambed and streambank will suffer no appreciable increase in erosion as a result of the proposed development, or will take certain engineering measures to prevent erosion of the streambed.

### Open space or community use set-asides

Many communities require that new developments or major subdivisions set-aside lands for the preservation of open space, community facilities and to protect environmental quality. The following is a summary related policies currently in place.

- Permanent open space set asides are required within the city's Multifamily Residence zoning districts and Planned Unit Development districts based on number of dwelling units in a project. There is no overall open space set-aside requirement for other zoning districts or subdivisions generally.
- In areas within the planning jurisdiction, but outside of the city limits, developments of clustered houses, duplexes, and townhouses intended for individual homeowners will require sufficient permanent open space, at the discretion of the Planning Commission.
- Where the comprehensive plan indicates that an area for a new subdivision should include part or all of a site for a school, park, open space preserve, or community facility, the developer shall be requested to dedicate or attempt to sell such site to the appropriate public agency. To any extent which may be sanctioned by the Zoning Ordinance, the Planning Commission may allow lot size reductions in a subdivision in exchange for dedications of such sites.
- The Floodplain Management Plan, which the city reviews annually, recommends that the city enact regulations to 1) require the implementation of low impact development techniques to minimize the need for more traditional stormwater management controls; and 2) provide incentives to set aside flood plains as permanent open space in new developments (consider provisions for clustering and conservation subdivisions).

#### Open Space set-asides.

Open space set-asides are private lands on a development site that are set aside in perpetuity for the purpose of preserving environmentally sensitive lands, buffer areas, tree canopy, recreational lands (passive and active), meeting or gathering places, and the like. These lands can be maintained in perpetuity through a variety of tools—including, but not limited to, easements, covenants, dedication (donation of the land to a public agency for public use), conveyance of the lands to a third party beneficiary etc.

### **Septic Systems**

Within the watershed of Lake Tuscaloosa, the minimum lot size for an onsite sewage disposal system is one (1) acre. Septic tanks will be allowed only with the approval of the County Health Department. No part of any onsite sewage disposal system, including field lines, will be installed closer than 300 feet from the edge of Lake Tuscaloosa at normal pool elevation. The Subdivision Regulations also do not permit satellite septic disposal lots without a variance.

### **Annexation and Utility provision**

There are currently no annexation boundaries or defined growth areas. Any owner of a property that is contiguous to the city Limits (which includes Lake Tuscaloosa) may petition for annexation. Most petitions for annexation fill the need to "accommodate the needs and wishes of petitioners." Most people who annex along Lake Tuscaloosa do so for access to city schools. Access to city utilities is another reason to seek annexation. The city requires that a property be annexed into the city's in order to receive public water and sewer service. However, annexation does not guarantee utility service. In areas beyond the city's existing utility service area, annexation resolutions will stipulate that the site will not receive these services until such time that utilities are extended.

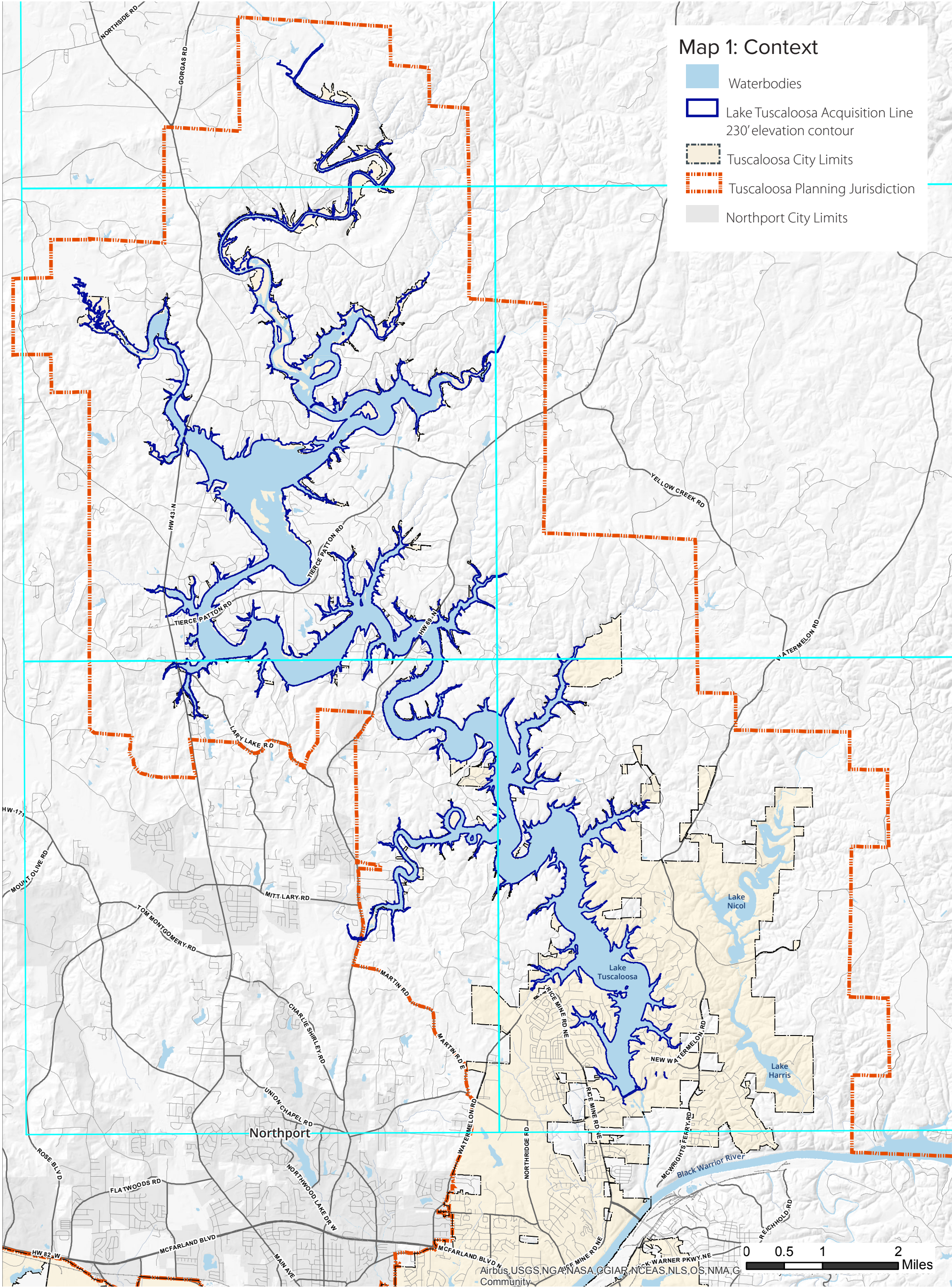
The annexation procedure entails:

- The property owner files a petition with Planning Division
- Planning and Zoning Commission votes to recommend/not recommend approval
- City Council votes to annex property

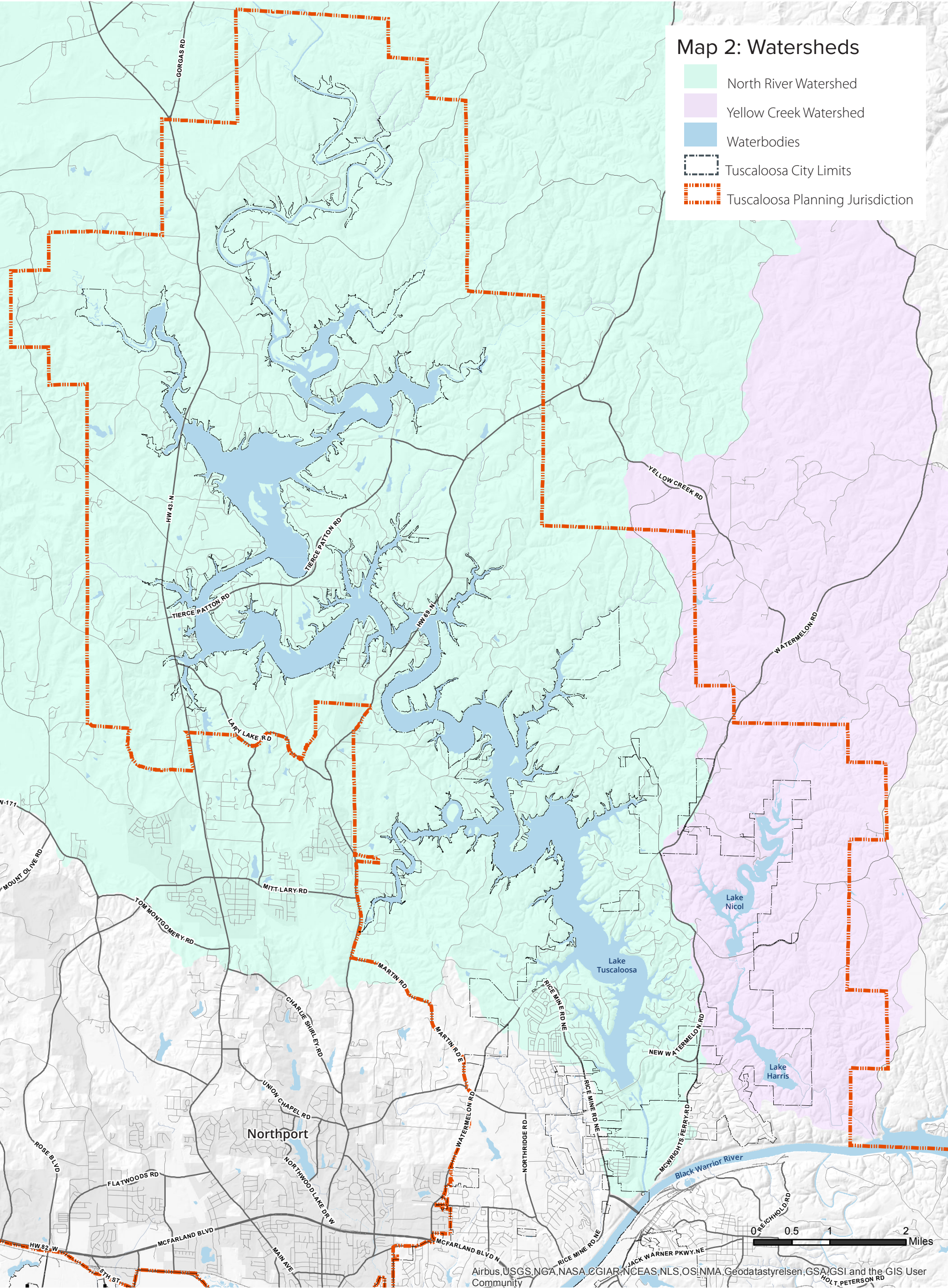
### **Recreational Activities**

Current activities that are permitted or regulated for the lakes and any city land adjacent to the lakes is shown on the attached graphics following the maps.

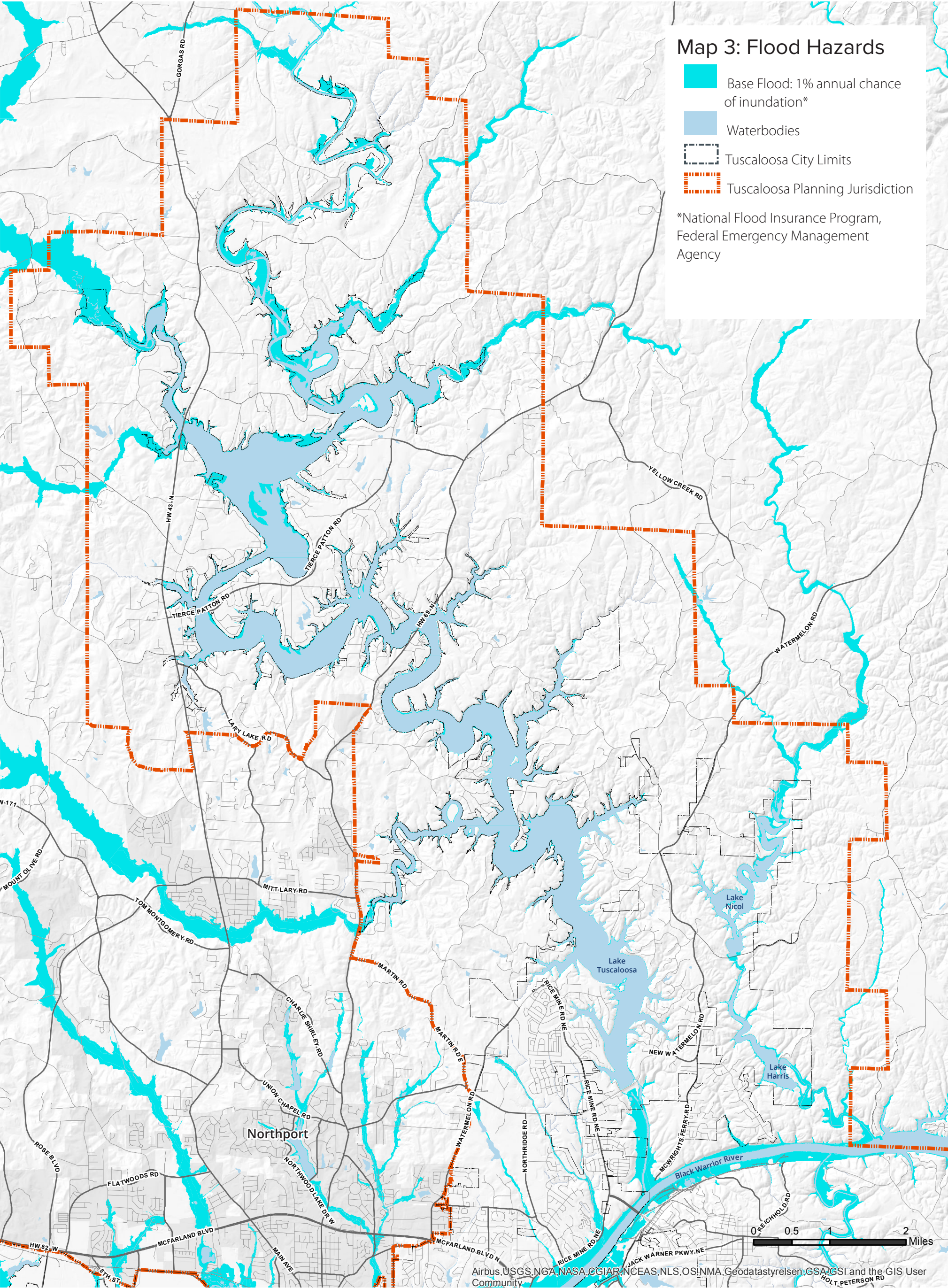




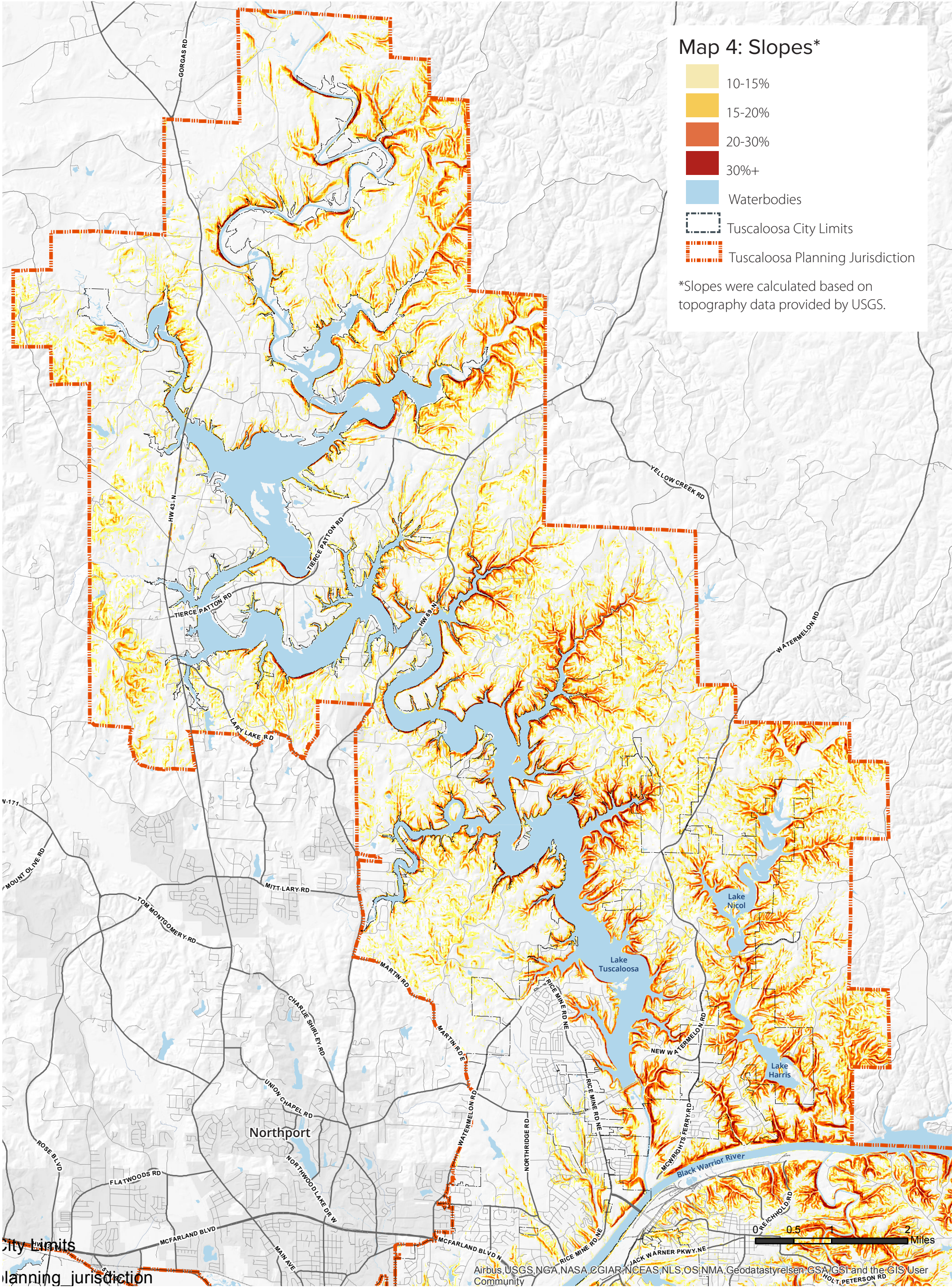




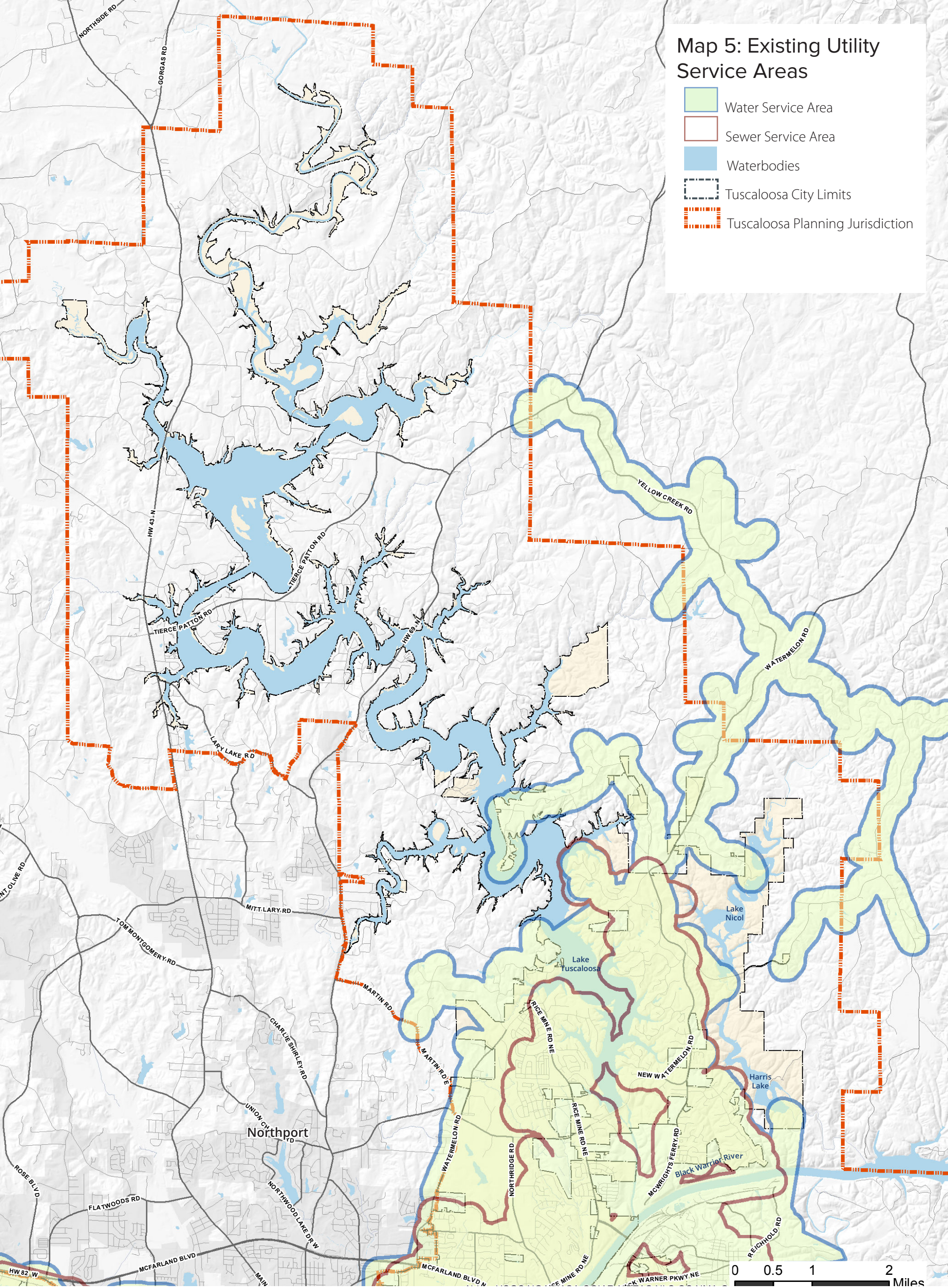




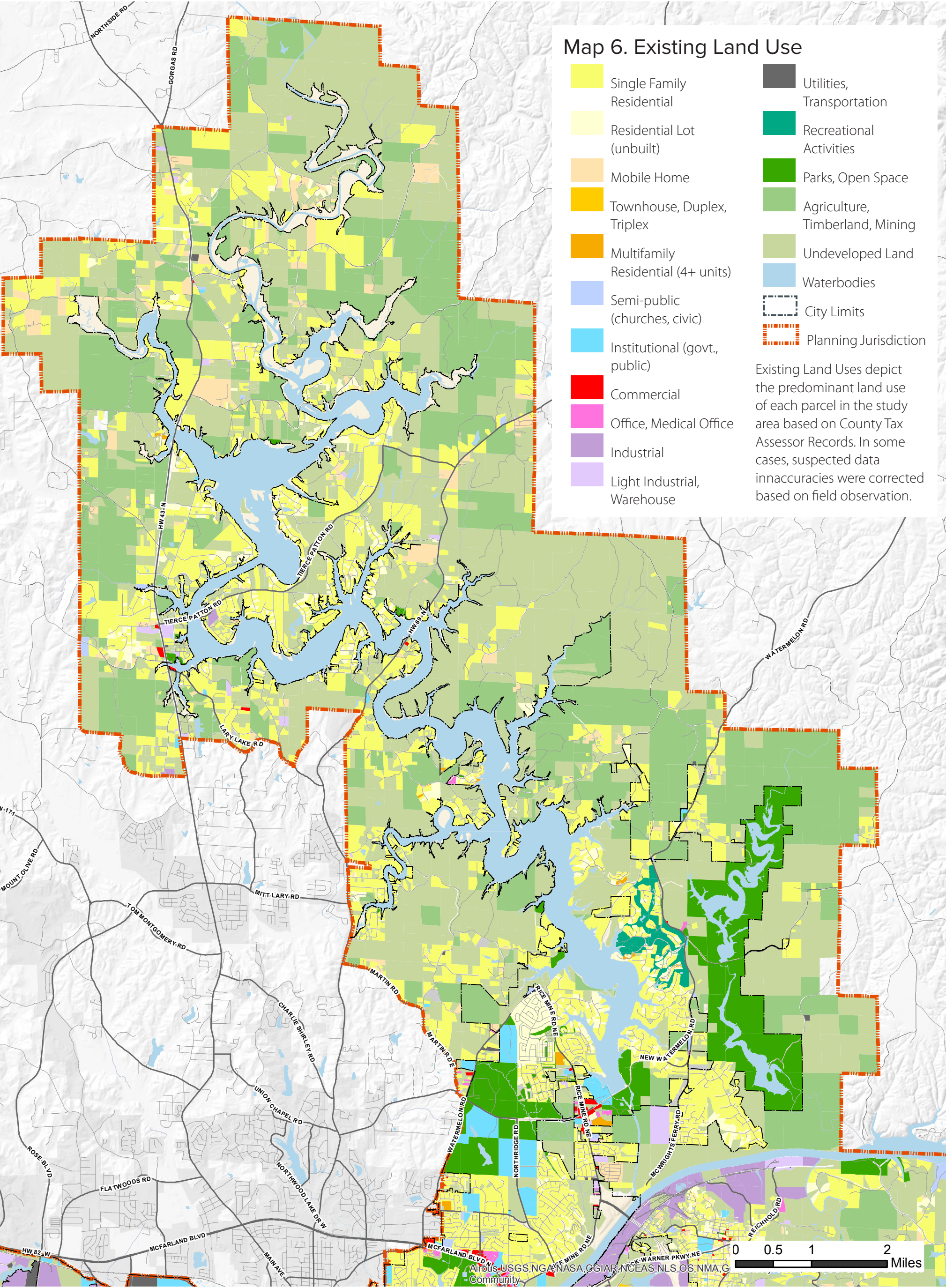








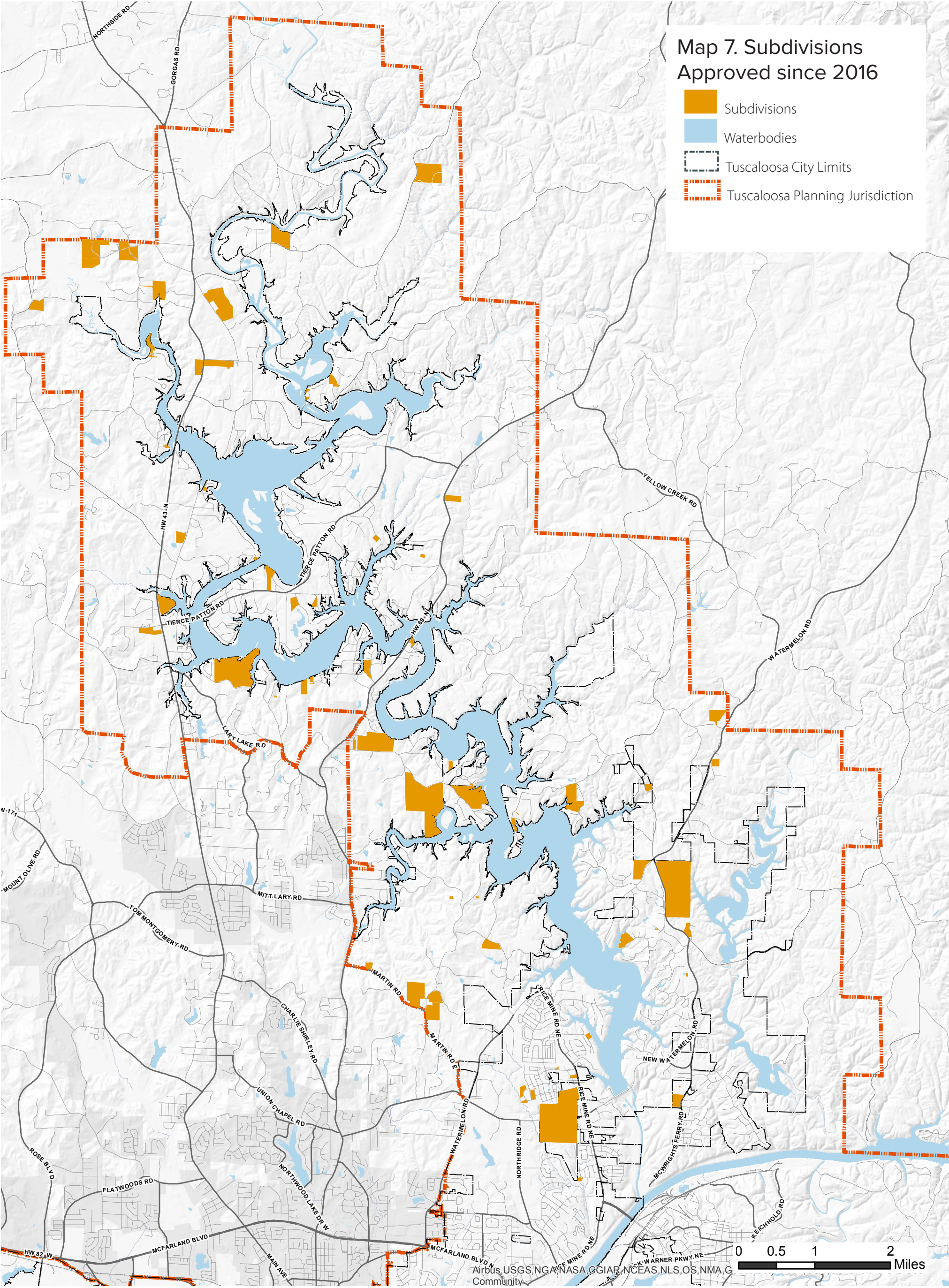






Map 7. Subdivisions  
Approved since 2016

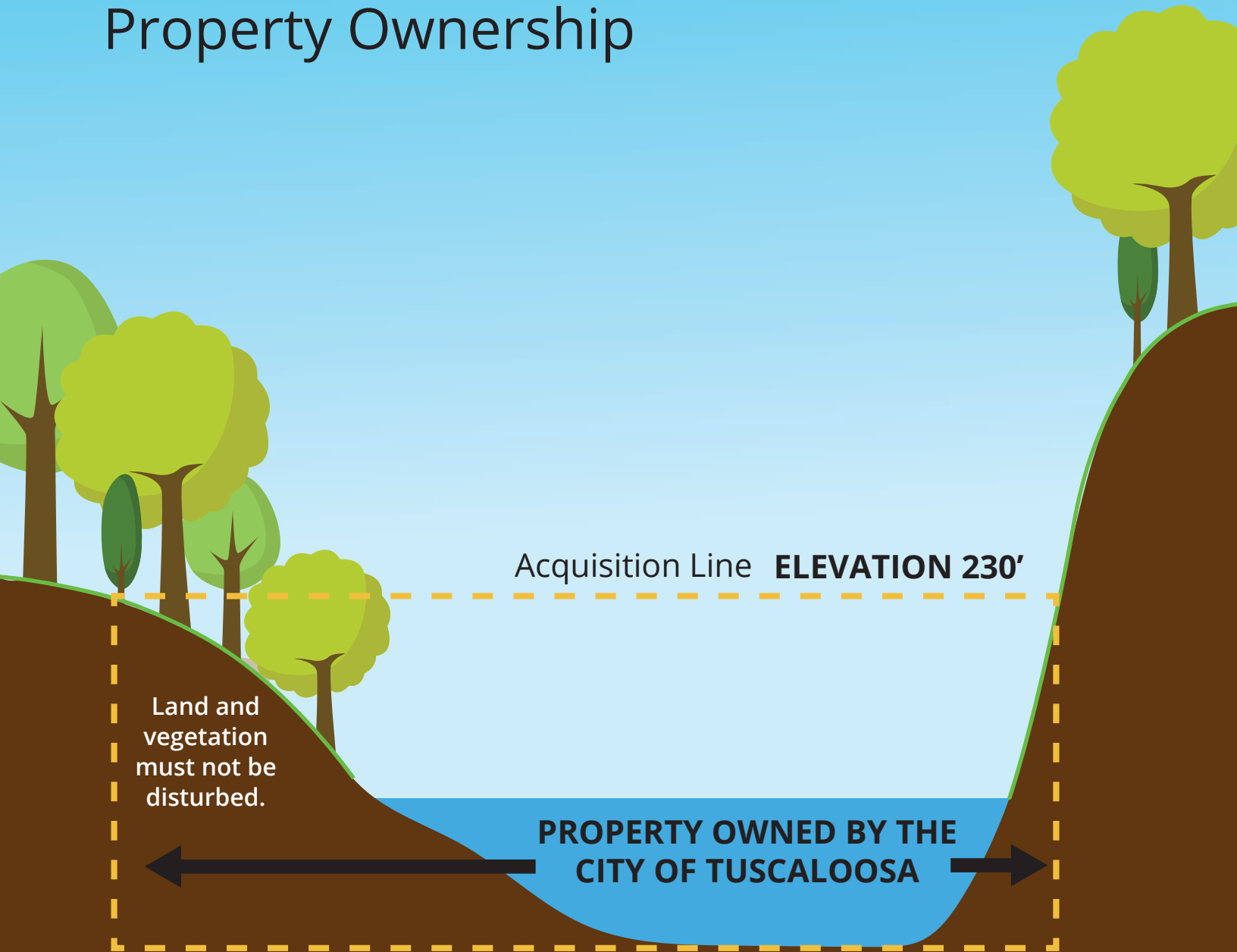
- Subdivisions
- Waterbodies
- Tuscaloosa City Limits
- Tuscaloosa Planning Jurisdiction





# LAKE TUSCALOOSA

## Property Ownership



# LAKE TUSCALOOSA

- Construction completed in 1970
- Spillway elevation of 223.2 feet
- 5,885 acres
- 177 miles of shoreline
- Contains approximately 40 billion gallons of water
- Could provide up to 200 million gallons per day of drinking water
- 3 Public Landings and Docks
- More than 1,200 Private Docks

## Activities (C.18, A.IV)

### Prohibited



Camping



Glass

### Conditional



Motorized  
Boats



Personal  
Watercraft



Water-Skiing



Open Fire

### Permitted



Fishing



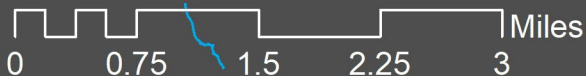
Swimming



Hiking



Bird Watching



# LAKE HARRIS

## Activities (C.18, A.IV)

### Prohibited



Camping



Motorized  
Boats



Personal  
Watercraft



Water-Skiing



Glass

### Conditional



Open Fire



Swimming



Fishing



Hiking



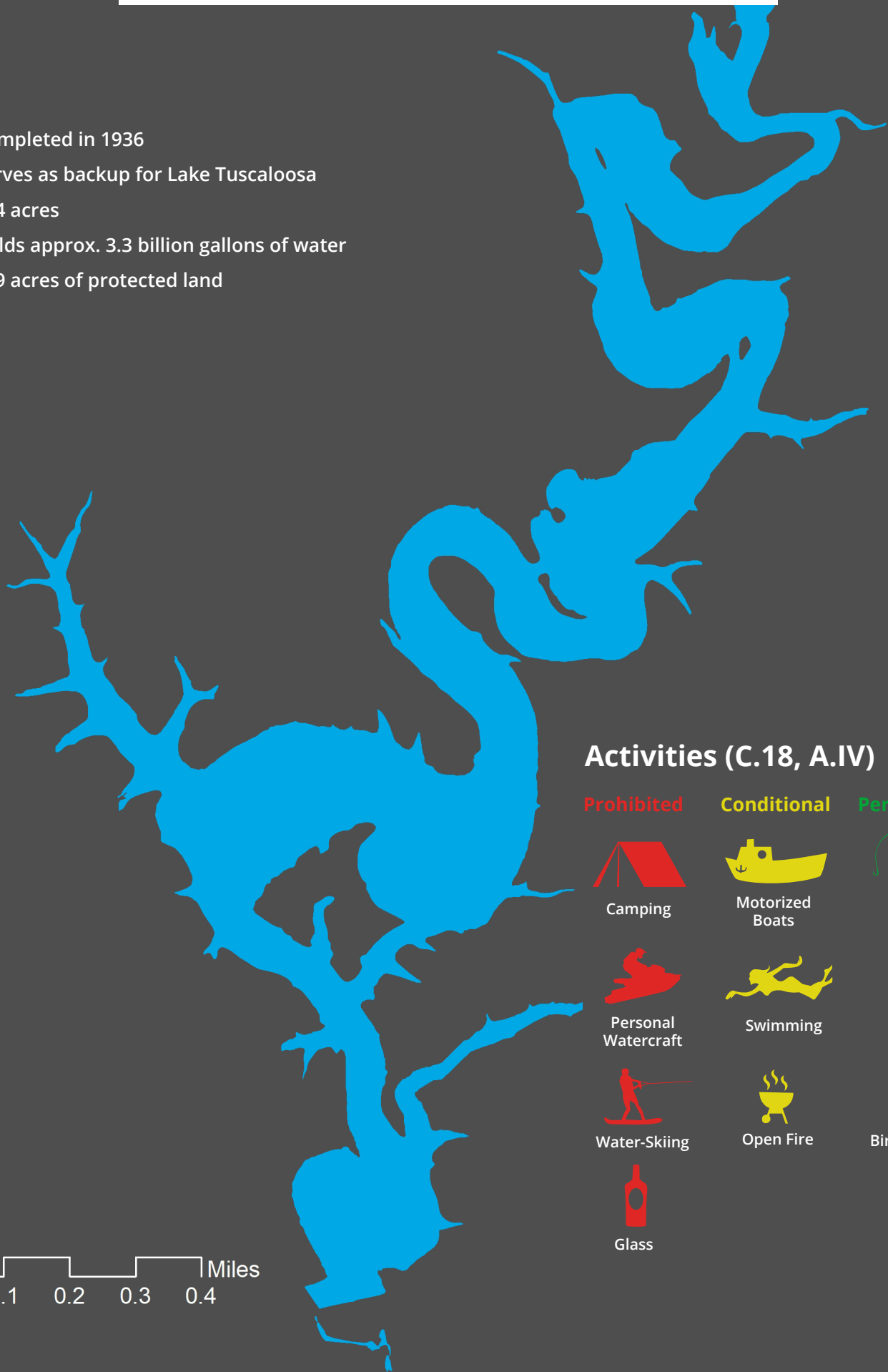
Bird Watching

- Construction completed in 1929
- Spillway elevation of 205 feet
- 220 acres
- Holds approximately 1 billion gallons of water
- Consists of two arch dams that were first true arch type dams constructed in Alabama
- 576 acres of protected land

0 0.1 0.2 0.3 0.4 Miles

# LAKE NICOL

- Completed in 1936
- Serves as backup for Lake Tuscaloosa
- 384 acres
- Holds approx. 3.3 billion gallons of water
- 709 acres of protected land



## Activities (C.18, A.IV)

### Prohibited



Camping



Personal Watercraft



Water-Skiing



Glass

### Conditional



Motorized Boats



Swimming



Open Fire

### Permitted



Fishing



Hiking



Bird Watching

0 0.1 0.2 0.3 0.4 Miles