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An assessment of the Bald Eagle breeding population along Lake Tillery and Blewett Falls Lake in North Carolina: 2002 breeding season

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**AN ASSESSMENT OF THE BALD EAGLE BREEDING
POPULATION ALONG LAKE TILLERY AND BLEWETT FALLS
LAKE IN NORTH CAROLINA: 2002 BREEDING SEASON**



**CENTER FOR CONSERVATION BIOLOGY
COLLEGE OF WILLIAM AND MARY**

Study
Conducted for



CP&L

A Progress Energy Company

**AN ASSESSMENT OF THE BALD EAGLE BREEDING POPULATION
ALONG LAKE TILLERY AND BLEWETT FALLS LAKE IN
NORTH CAROLINA: 2002 BREEDING SEASON**

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**CP&L - A Progress Energy Company
Raleigh, NC 27602-1551**



The Center for Conservation Biology is an organization dedicated to discovering innovative solutions to environmental problems that are both scientifically sound and practical within today's social context. Our philosophy has been to use a general systems approach to locate critical information needs and to plot a deliberate course of action to reach what we believe are essential information endpoints.

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EXECUTIVE SUMMARY

For the second consecutive year, a Bald Eagle survey was conducted for Carolina Power & Light Company along the Pee Dee River in North Carolina. The survey canvassed the shorelines and associated forests from Lake Tillery to Cheraw, South Carolina. As in 2001, there were three active nests located: (1) one on Lake Tillery; (2) one in the reach between Lake Tillery and Blewett Falls Lake; and (3) one on Blewett Falls Lake. An additional adult pair with one young was observed between Lake Tillery and Blewett Falls Lake but no nest was located. The total number of occupied territories increased from 3 to 4 for the 2001-2002 period.

Productivity for this population was undetermined in 2002. One territory was undiscovered until after the young fledged leaving unknown the number of young produced. Total number of young observed was 4 in 2002 as compared to 5 for 2001. One nest was abandoned during the incubation period this year. A second nest was blown out during a storm between the two survey flights and the fate of the nestlings was unknown.

BACKGROUND

Historically, the Bald Eagle (*Haliaeetus leucocephalus*) was a common breeding species along major river systems, lakes, and coastal areas throughout much of North America. The widespread use of persistent pesticides for crop management in the region resulted in dramatic declines over a 30-40 year period. By the late 1960's, most breeding populations had been decimated by eggshell thinning and associated low productivity. Concern for these populations prompted the elevation of the Bald Eagle to "Endangered" status and led to a national effort to restore historic populations. Since the nationwide ban on many persistent pesticides in 1972, many populations have experienced gradual recoveries in both productivity and total numbers. The Bald Eagle's protection status was revised by the U.S. Fish and Wildlife Service (Service) to "Threatened" in 1999 due to continuing recovery. The species may be removed from the Federal Threatened and Endangered Species list by the Service pending further review. The state of North Carolina has seen an increase from no breeding pairs in the late 1960's to 34 nesting pairs in 2000. With recent increases in Bald Eagle populations, contemporary surveys are necessary to track breeding and successful reproduction.

Work conducted by The Center for Conservation Biology in 1995 and 1996 identified areas of consistent use by Bald Eagles in inland areas of North Carolina and suggested that nesting activity should be anticipated in the Yadkin-Pee Dee River basin (Bradshaw, D. et. al. 1996). In 2001, the Center for Conservation Biology conducted an aerial survey of Lake Tillery and Blewett Falls Lake, including riverine portions of the Pee Dee River, at the request of Carolina Power & Light Company (CP&L). Results of that study are detailed in Watts and Bradshaw (2001). The 2002 survey was repeated at the same locations using the same methodology as the 2001 study for comparative purposes. The study objectives were (1) to document the status, distribution, and productivity of nesting pairs at CP&L reservoirs and associated river corridors and (2) to increase our understanding of Bald Eagle natural history in the interior regions of North Carolina.

METHODS

Waterways

Waterways covered by the Bald Eagle survey of 2002 included: (1) Lake Tillery, 2) Blewett Falls Lake, (3) reach of the Pee Dee River from Tillery Hydroelectric Plant Dam (Lake Tillery) to headwaters of Blewett Falls Lake, and (4) reach of the Pee Dee River from Blewett Falls Dam to the U.S. Highway 1 bridge in Cheraw, South Carolina. The survey of Lake Tillery included the waterways between Falls Dam and Tillery Dam (also known as Norwood Dam).

Nest Survey

All major waterways and tributaries associated with the study system were surveyed for breeding Bald Eagles. A high-wing Cessna 172 aircraft was used to systematically overfly the land surface at an altitude of approximately 100 m to detect eagle nests. Flights were flown to systematically move between the shoreline and a distance of approximately 1 km to cover the most probable breeding locations for Bald Eagles. All nests detected were plotted on 7.5 minute U.S. Geological Survey topographical maps and given a unique alpha-numeric code. Each nest

was examined during the aerial survey to determine its structural condition, the type and condition of nest tree, and the condition of the surrounding landscape. In addition to recording all nests detected, the area was searched for mature and immature Bald Eagles. All Bald Eagles detected within the survey area were recorded. In addition to recording Bald Eagles, locations of all Great Blue Heron (*Ardea herodias*) colonies were recorded and mapped. The survey was conducted on April 23, 2002, several weeks later than the survey conducted in 2001. The delay in the initial survey was due to repeated conflicts between scheduled flights and poor flight conditions.

Productivity Survey

All active Bald Eagle nests were rechecked to determine productivity, or number of eaglets produced. A Cessna 172 aircraft was used to fly low over nests to allow observers to examine nest contents. The number of eaglets present was recorded along with their approximate ages. Ages were estimated based on known plumage and size attributes at different growth intervals. Each nest was also examined to determine its structural condition. Observations of all Bald Eagles detected were recorded. The survey was conducted on June 6, 2002.

SURVEY FINDINGS

The reservoir system between the town of Yadkin above High Rock Reservoir and the town of Cheraw, SC near the NC/SC state boundary was found to support 8 occupied Bald Eagle territories and 8 Great Blue Heron colonies with an estimated 726 pairs. CP&L waterways between Alcoa Power Generating, Inc.'s (APGI's) Falls Dam and Cheraw, SC, supported 4 occupied Bald Eagle territories and 1 Great Blue Heron colony with 39 pairs.

Lake Tillery

A single Bald Eagle nest was located along the west shoreline of Lake Tillery just below Tater Top Mountain and within the Morrow Mountain State Park boundary. This nest was determined to be active and productive (see details below). Large blocks of land along the lake's east shoreline have been converted to residential development in recent years. Development is particularly widespread in the lower section of the reservoir; a considerable distance downstream of this nest. Much of the shoreline in this area of the lake is unlikely to attract additional eagle pairs. However, several sections of shoreline remain relatively undisturbed, and contain trees capable of supporting nest structures; particularly along the area associated with Morrow Mountain State Park. Development dissipates in the upper reaches of the lake. The extreme upper portion of the lake seems to support the greatest concentration of breeding habitat. Extensive sections of timber that are of the age and size class capable of supporting nest structures remain. The current breeding territory is positioned within this general area. Whether or not additional territories will be formed in this section will depend on food availability.

Nest: ST-01-04

Nest Location

This nest is located along the west shoreline below Tater Top Mountain and within the Morrow Mountain State Park boundary (Figures 1 and 2). The nest tree is within a cluster of older trees positioned near a ridge top. The nest tree is dead and recessed within the tree cluster such that it is difficult to observe the nest except from directly above. The nest may be visible from the water within adjacent cove.

June 6, 2002. There was no evidence of work on the nest during 2002 breeding season, and it was considered inactive.

Nest Substrate

Substrate Type – Live loblolly pine.

Nest Position – Nest was positioned in very deep top crotch well below crown. Surrounding trees were of even height making detection from air difficult. Tight packing of adjacent trees results in very poor crown access. Birds may approach nest from below canopy. Exposure of nest surface to sky was less than 10%.

Substrate Condition – Nest tree was live and appeared to be in good condition. No indication of crown limb damage.

Potential Disturbance

Nest tree was positioned within a loblolly pine stand with a good visual buffer. Proximity to major roadway suggests that access to tree is high. However, dense forest stand appears to provide adequate buffer from disturbance. Nest does not appear to be visible from roadway or water (Figures 6 and 7).

Nest: ST-02-01

Nest Location

This nest is located along the edge of a field near NC Highway 731 just below the Tillery Hydroelectric Dam (Crutchfield, J. pers.comm.). The nest is within the breeding territory of pair utilizing Nest ST-01-03 in 2001 and appears to be a replacement for that nest (Figure 3).

Nesting Activity

Bird Activity – During February, 2002 CP&L biologists observed a pair of adult eagles building a nest. Although considerable searching was conducted within this territory by plane, no nest or eagle activity was observed during the survey flight. However, the location was visually confirmed on the ground by CP&L. Following are observations provided by R. Bryson, CP&L.

“The eagle pair was observed on March 7, 22, and April 4, 2002. During each of these bi-weekly surveys, an adult was observed perched on a deciduous tree on the edge of the field in close proximity to the nest. The second adult was observed each time either on the nest, or flying to the nest and assuming an incubating position. As of the April 17, 2002 survey date, and continuing through July, no eagles were observed near the nest, or the surrounding tailrace area.”

Nest Condition – Nest under construction in February of 2002 (Crutchfield, J. pers. comm.). The newly constructed nest was in good condition in a live loblolly pine (Bryson, R. pers.comm.).

Nest Substrate

Substrate Type – Live loblolly pine.

Nest Position – This deep and narrow nest was secured among limbs below the tree crown (Bryson, R. pers.comm) (Figures 4 and 5).

Substrate Condition – Nest tree was live and appeared to be in good condition (J. Crutchfield pers.comm.).

Potential Disturbance

The nest is located at the edge of an active agricultural field and is approximately 180 m from NC Hwy 731. The nest is visible from the highway. Birders in the area are aware of the nest and stop along the road to observe the birds when they are in the area (Bryson, R. pers. comm.) (Figures 3, 6 and 7).

Figure 3. Map location for Nests ST-01-03 and ST-02-01. (Black ellipse is heron colony).



Figures 4 and 5. Nest tree and close-up of Nest ST-02-01. Photos courtesy Robin Bryson, CP&L.

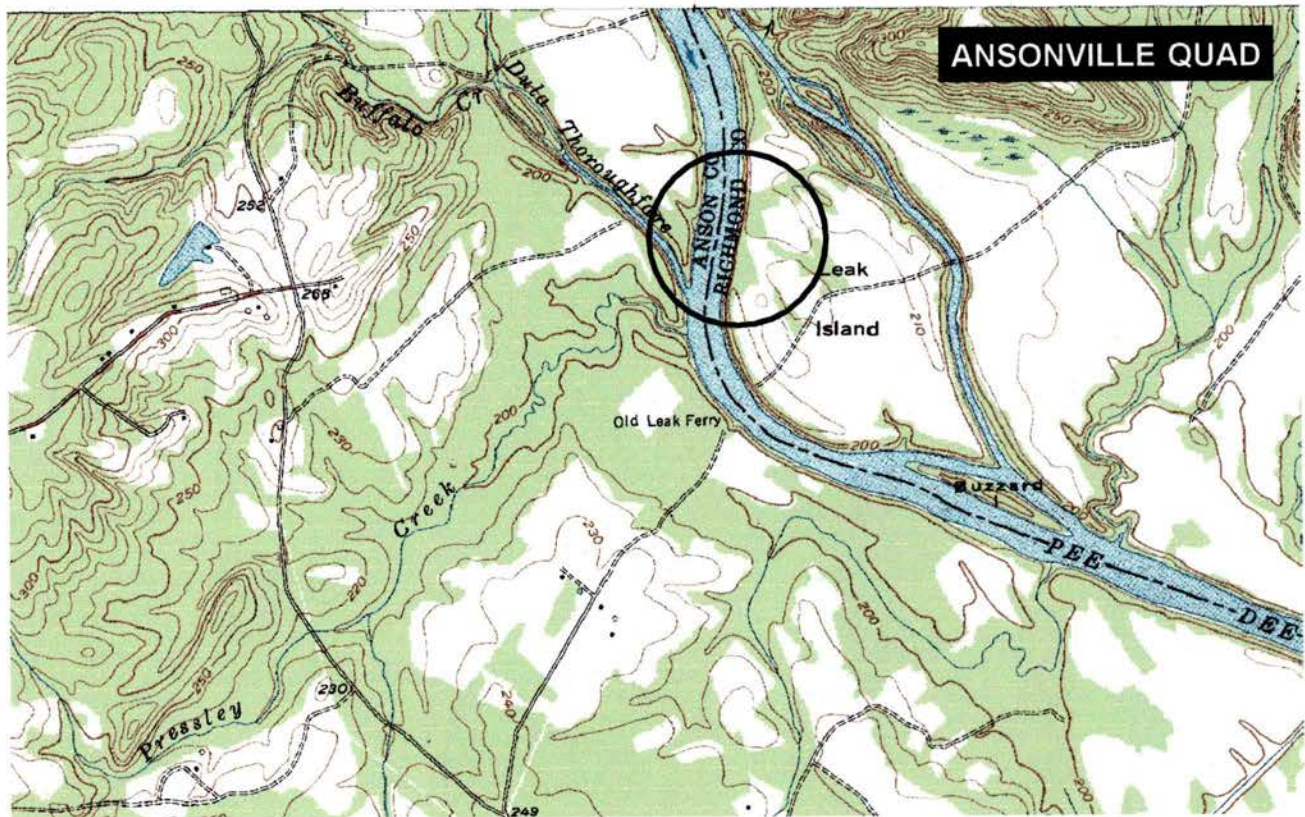


New Occupied Territory

On June 6, 2002, a pair of adult eagles was observed attending a fledged young-of-the-year along the west shoreline of Leak Island (area shown in Figure 8). All three birds were observed flying out over the river and back to the shoreline to perch on a single sycamore tree. Given the behavior and age of the young bird, it is likely that the birds were within 1-2 km of an active nest. An area-restricted search was conducted but the high density of hardwood trees made it impossible to see below the canopy. CP&L biologists observed an adult Bald Eagle feeding in this area during environmental sampling in May 2002 (Crutchfield, J. pers. comm.). This site is considered to be an occupied territory that was active during the 2002 breeding season.

This site will receive a site code upon confirmation of a nest structure.

Figure 8. Map of location of adult pair with recently fledged young along the Pee Dee River.



Blewett Falls Lake

One Bald Eagle nest was located along the shoreline of Blewett Falls Lake. The nest was located just above the Blewett Hydroelectric Plant Dam. It was determined to be active but unproductive. There are several large blocks of land along Blewett Falls shoreline that, from a nesting substrate perspective, have the potential to support Bald Eagle territories. One of the most promising locations lies along the east shoreline near the Blewett Dam. Recent forestry activity within this location has opened up many potential nest trees with good crown access. Many of these trees have ideal structure to support eagle nests.

Nest: AN-01-01

Nest Location

This nest is located on a short peninsula along the west shoreline just above the Blewett Hydroelectric Plant Dam. The nest is situated approximately 100 m back from the shoreline in a pine stand that has been thinned and contains scattered pines (Figures 9 -11).

Nesting Activity

Activity – On April 23, 2002, a single bird in adult plumage was perched in a loblolly pine within 50 m of nest tree. The second adult was not observed. Two chicks were observed standing in the nest cup. Chicks appeared to be 15 days old. On June 6, 2002, no birds were observed near the nest location. The nest appeared to have been lost to windthrow and was completely gone. Based on the estimated age of these chicks they would not have reached fledging age prior to the loss of the nest suggesting that the nest may have failed.

Condition – The nest used in 2001 had been lost late in the season. The new nest was constructed in the same position in the same tree. Nest structure was smaller than in 2001 but was in good condition with grass lining on April 23, 2002. Nest structure was completely gone on June 6, 2002.

Nest Substrate

Substrate Type – Supercanopy loblolly pine.

Nest Position – Nest was positioned in a multiple-prong top crotch. Wide spacing of trees around nest appeared to allow for good crown access. Crown limbs are widely spaced such that nest had approximately 50% sky exposure.

Substrate Condition – Live loblolly pine in fair condition. Foliage appeared to be somewhat yellow and crown foliage was sparse. May have experienced previous crown damage. Tree is positioned within older loblolly stand among scattered trees.

Potential Disturbance

The nest tree was protected by considerable forest buffer on the upland side but it was within relatively short distance of the power line right-of-way and the hydroelectric power plant. Nest was likely visible from dam as well as from lake surface.

Figures 10 and 11. Aerial photographs of the location of Nest AN-01-01. *Photos by Bryan Watts.*



Summary

The 2002 Bald Eagle survey yielded fewer new observations of Bald Eagle nesting activity, but reaffirmed that eagles are clearly beginning to colonize available territories along the Pee Dee River. Table 1 shows survey results from 2002 as compared to 2001 for comparison.

Table 1. Comparison of eagle survey results for 2001 and 2002.

River Reach	Occupied Territories		Nests Identified		Status		Bald Eagle Young Produced	
	2001	2002	2001	2002	2001	2002	2001	2002
Lake Tillery	1	1	ST-01-04	ST-01-04	Active	Active	1	1
Tillery Dam to Blewett Falls Lake	1	1	ST-01-03	ST-01-03 ST-02-01	Active -	Inactive Active	2 -	0*
Blewett Falls Lake	1	1	AN-01-01	AN-01-01	Active	Active	2	2**
Pee Dee below Blewett Falls Lake	0	1	-	Not found	-	-	-	1***
Totals	3	4					5	4

* Nest abandoned sometime near the end of the incubation period. Cause unknown.

** Fate of nestlings unknown. Nest blown out late during nestling stage. No evidence of fledglings present on second survey flight.

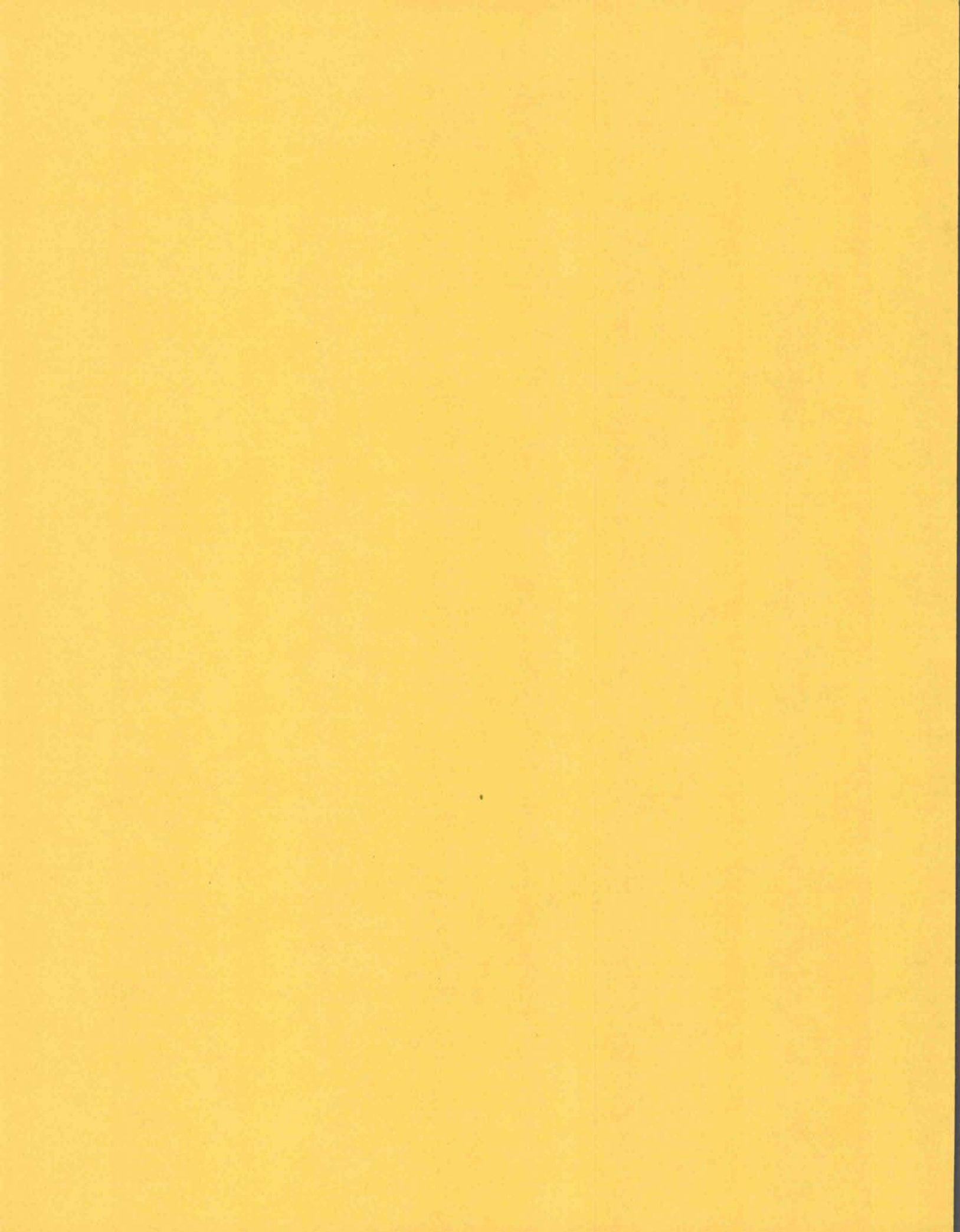
*** Adult pair with fledged young located in new area, but no nest found, and no confirmation on total number of young present.

The table illustrates two points worth noting. First is the location of a new nest (Nest ST-02-01) adjacent to a damaged nest (Nest ST-01-03) from 2001. This site below Tillery Dam suggested a definitive territory and should continue to harbor birds well into the future. Possible disturbance from observers stopping along NC Hwy 731 is probably the one variable most likely to influence nest placement and productivity in the future.

Also worth mentioning is the observance of an adult pair with young further downstream on the Pee Dee River corridor between Lake Tillery and Blewett Falls Lake. The presence of adult birds in this area was also corroborated by CP&L observers and suggests a clear indication of an additional occupied territory, and continuing growth of this small population. At this point there is reason to suspect that additional pairs will continue to pop up along the river contingent on food availability and reasonably secure nest sites.

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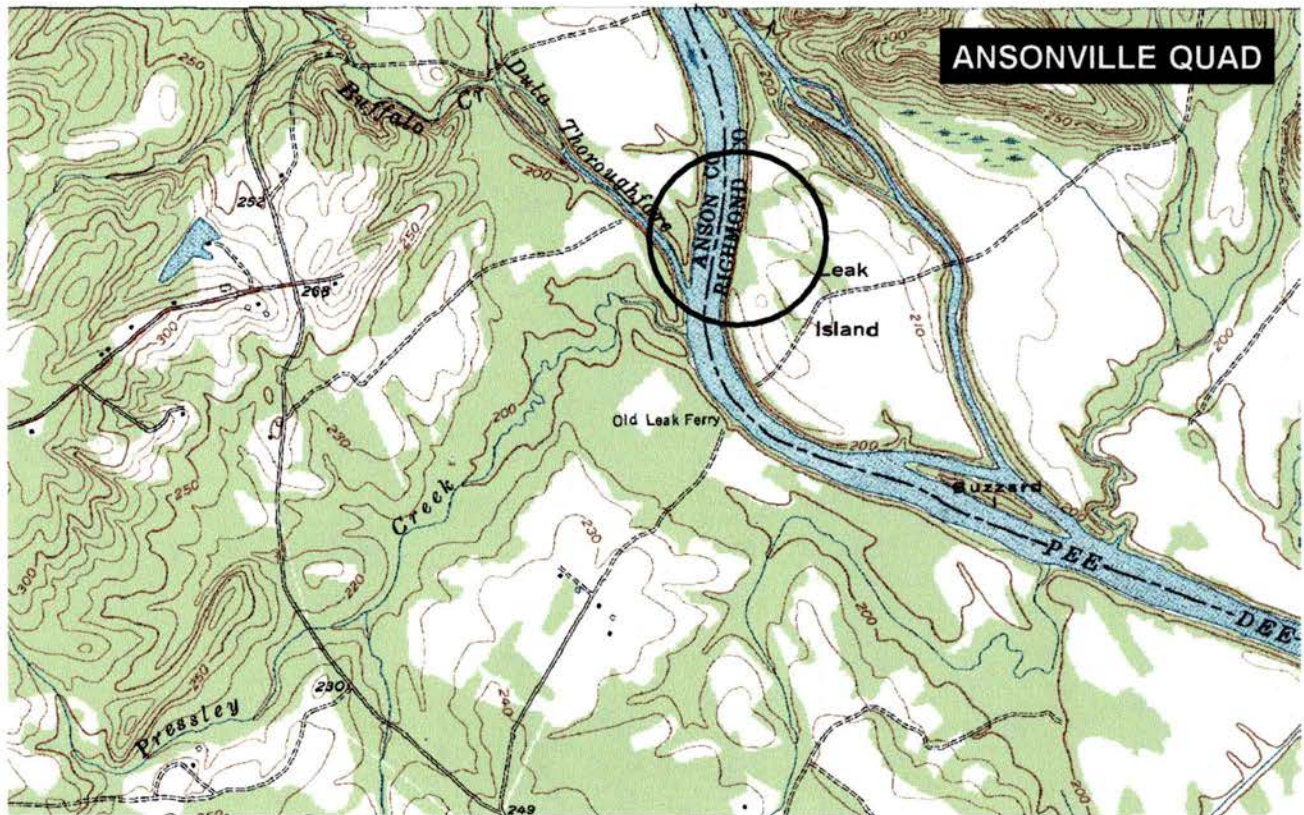


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This site will receive a site code upon confirmation of a nest structure.

Figure 8. Map of location of adult pair with recently fledged young along the Pee Dee River.

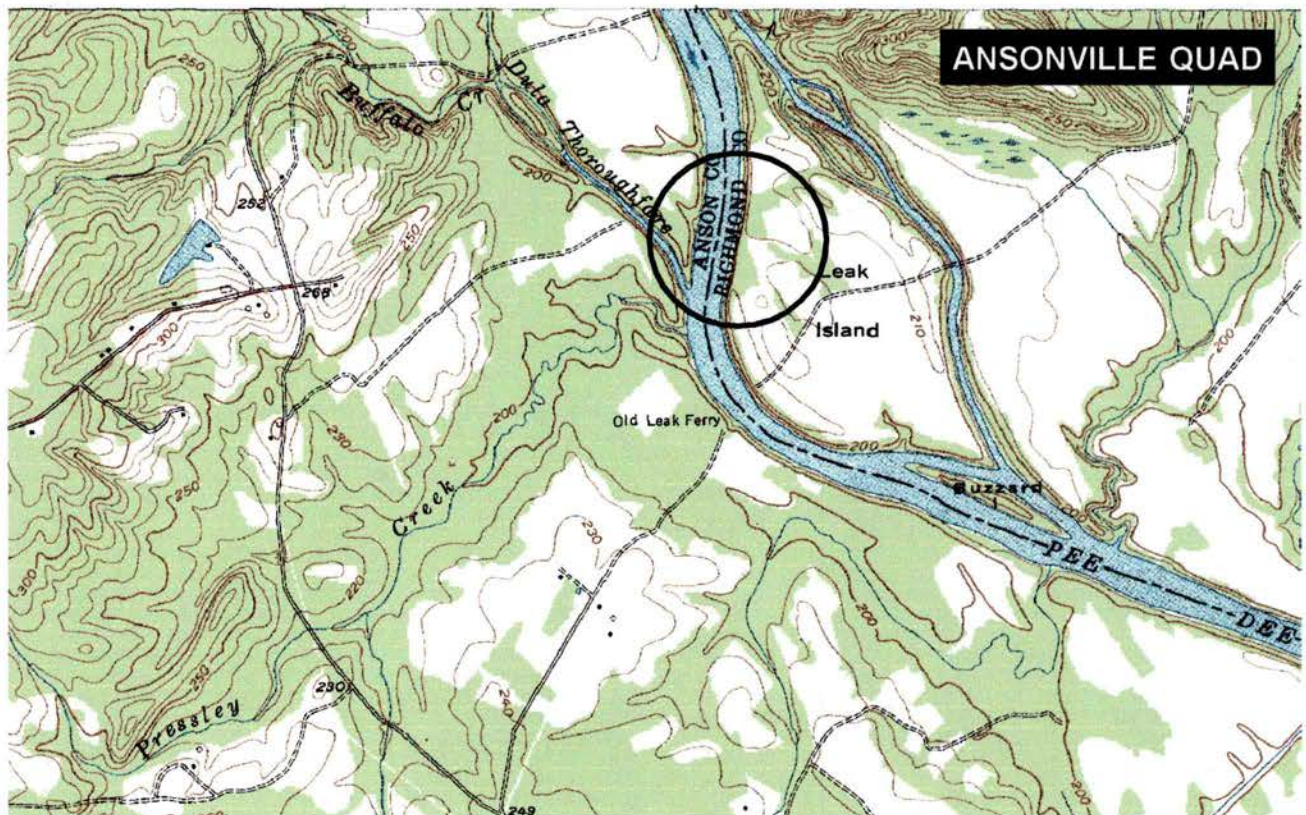


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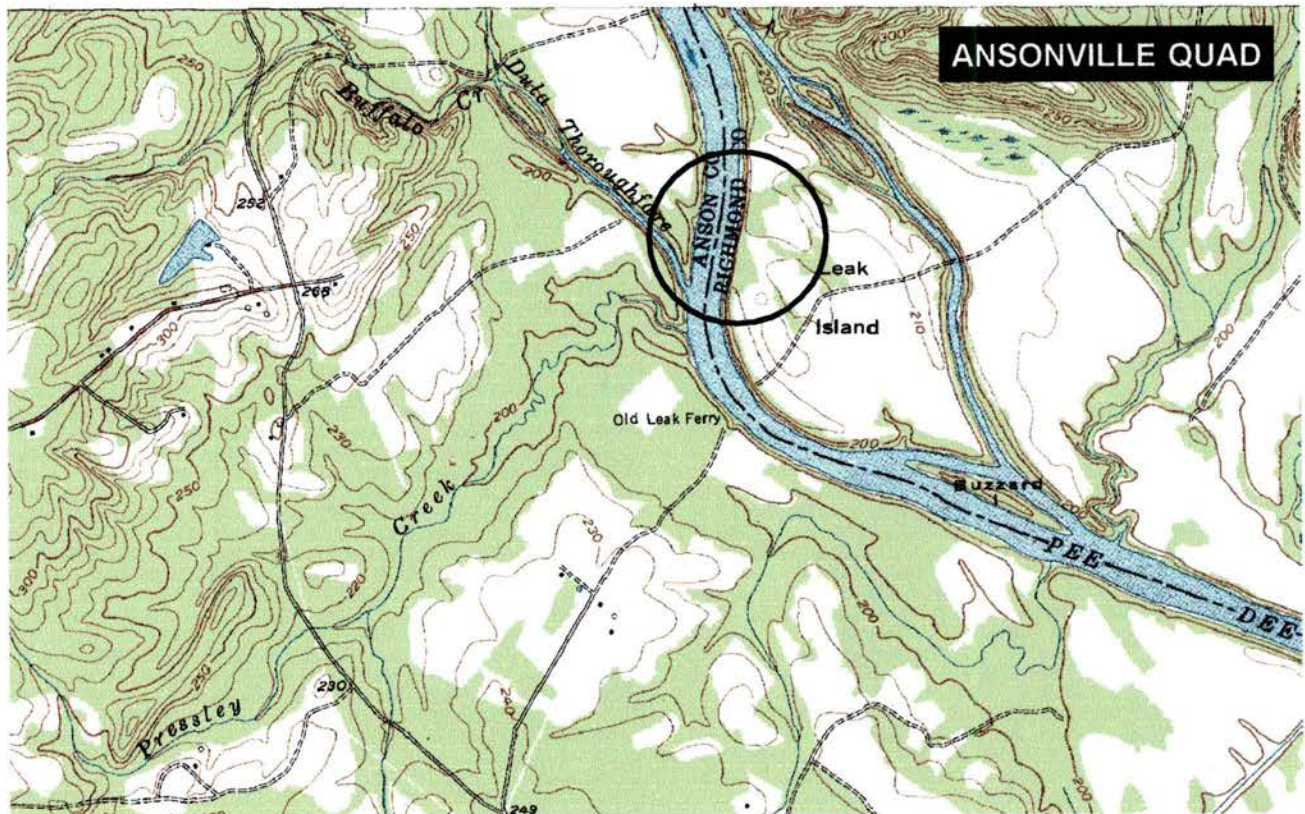


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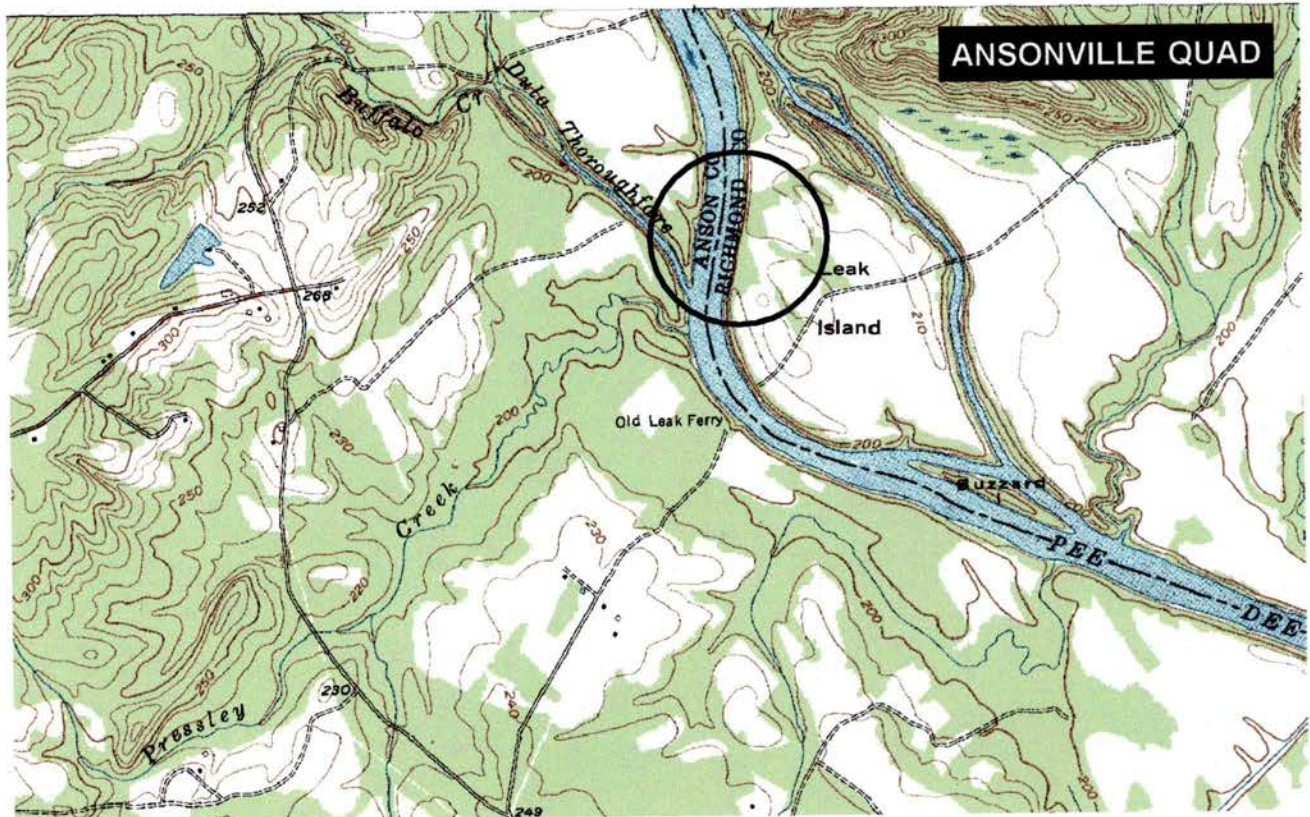


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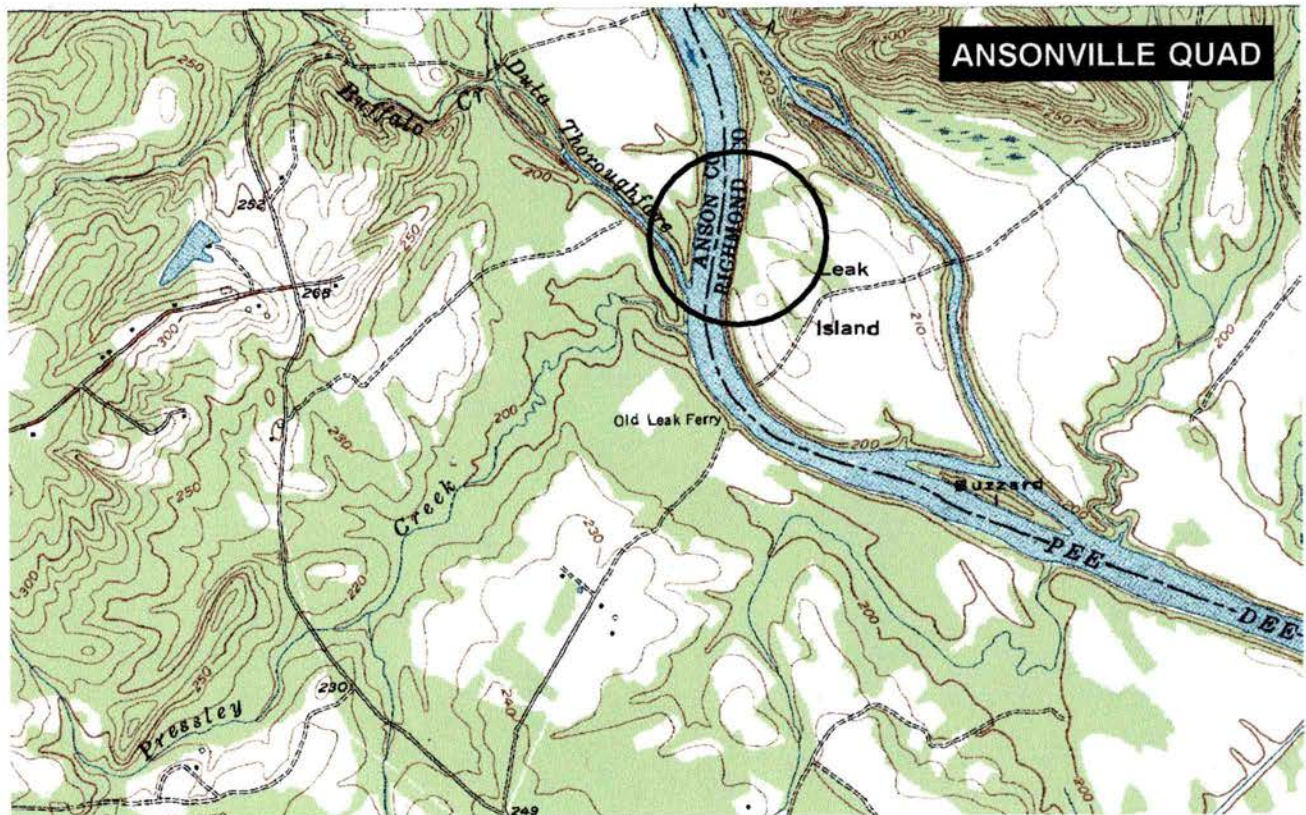


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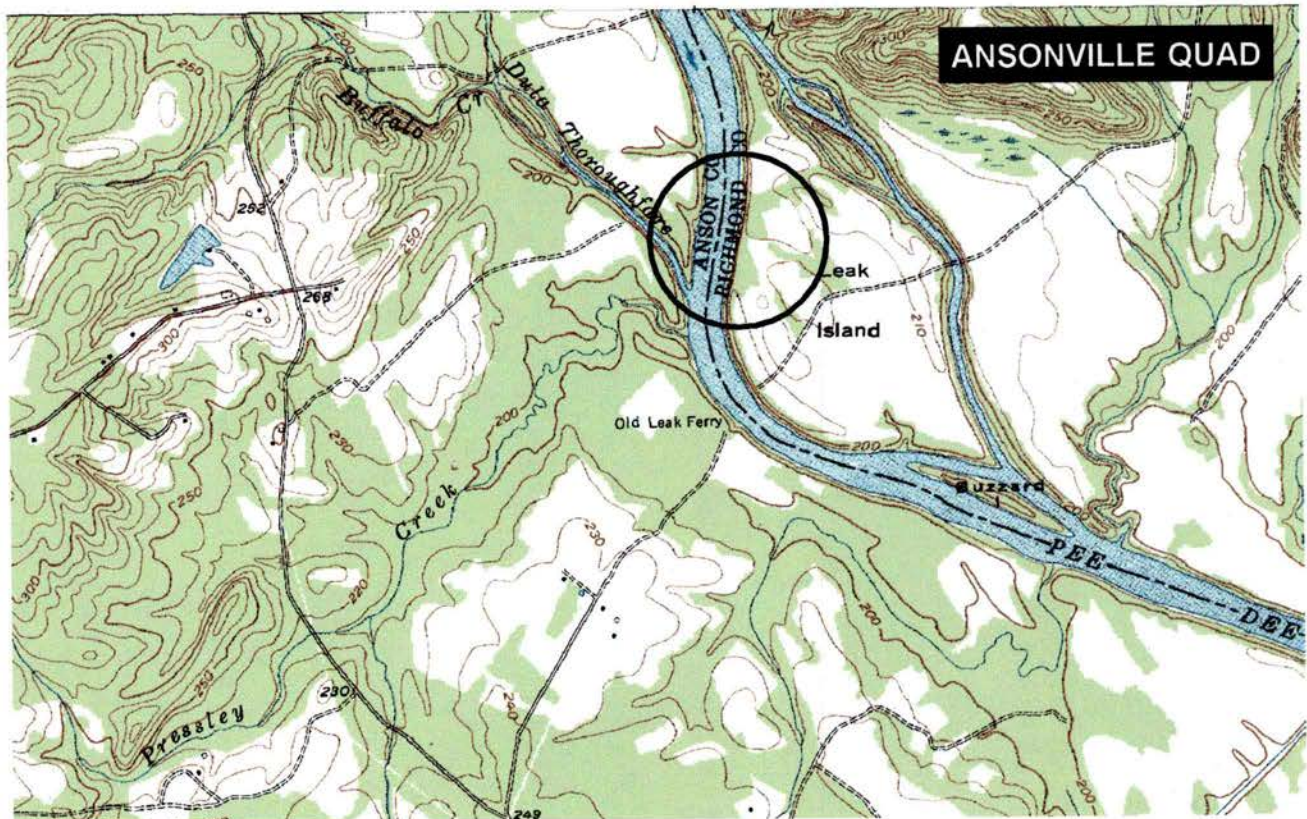


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