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An assessment of the bald eagle breeding population along Lake Tillery and Blewett Falls Lake in North Carolina: 2005 breeding season

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AN ASSESSMENT OF THE BALD EAGLE BREEDING POPULATION ALONG LAKE TILLERY AND BLEWETT FALLS LAKE IN NORTH CAROLINA: 2005 BREEDING SEASON

CENTER FOR CONSERVATION BIOLOGY
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AN ASSESSMENT OF THE BALD EAGLE BREEDING POPULATION ALONG LAKE TILLERY AND BLEWETT FALLS LAKE IN NORTH CAROLINA: 2005 BREEDING SEASON

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Cover Photo: Eaglets in nest (*photo by Catherine Markham***)**

The Center for Conservation Biology is an organization dedicated to discovering innovative solutions to environmental problems that are both scientifically sound and practical within todays 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

Waterways along the Yadkin-Pee Dee River between Lake Tillery and Blewett Falls Lake were surveyed for nesting bald eagles and great blue herons during the breeding season of 2005. Four bald eagle territories were determined to be active including 2 on Lake Tillery, 1 along the Yadkin-Pee Dee River between Tillery Dam and Blewett Falls Lake, and 1 on Blewett Falls Lake. Collectively, these pairs produced 9 chicks. Two great blue heron colonies were located including 1 on the lower portion of Lake Tillery and 1 below the Norwood Dam. These colonies supported 88 nesting pairs.

Populations of both bald eagles and great blue herons continue to increase along the upper Yadkin-Pee Dee River. The river between the town of Yadkin above High Rock Reservoir and Blewett Falls Lake now supports 7 occupied bald eagle territories that produced 14 chicks in 2005. This reach now supports 12 great blue heron colonies that in 2005 contained 942 pairs of great blue herons and 15 pairs of great egrets. Activity continues to be focused around hydro-electric dams presumably because the flow conditions below these structures improves food availability and foraging for these bird species.

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 approximately 40 nesting pairs in 2003.

Since 2001, The Center for Conservation Biology has conducted aerial surveys for nesting bald eagles on Like Tillery and Blewett Falls Lake, including riverine portions of the Pee Dee River, at the request of Progress Energy Carolinas (formerly CP&L). Results of those studies have been detailed in Watts and Bradshaw (2001, 2002, 2003).

OBJECTIVES

The objectives of the bald eagle survey on Progress Energy Carolinas reservoirs and hydroelectric plant tailwaters were (1) to document the status, distribution and productivity of nesting pairs in association with the reservoirs and associated river corridors and (2) to increase our understanding of Bald Eagle natural history in interior regions of North Carolina. A third objective was to determine the status and distribution of breeding great blue herons along the Yadkin-Pee Dee River.

METHODS

Waterways

Waterways covered by the bald eagle survey of 2005 included all, or portions of: (1) Lake Tillery, (2) Blewett Falls Lake, and (3) the reach of the Pee Dee River from Tillery Hydroelectric Plant Dam (Lake Tillery) to the headwaters of Blewett Falls Lake. The survey of Lake Tillery included the waterways between Falls Dam and Tillery Dam (also known as Norwood Dam).

Bald Eagle

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 min topographic maps and given a unique alpha-numeric

code. Each nest was examined 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 bald eagles. All eagles detected within the survey area were recorded. The survey was conducted on 6 April 2005.

Productivity Survey - All active Bald Eagle nests were rechecked to determine productivity. 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. Each nest was also examined to determine its structural condition. Observations of all bald eagles detected were recorded. The survey was conducted on 9 May 2005.

Great Blue Herons

All breeding colonies of great blue herons detected during survey flights were mapped and recorded. Colony locations were plotted on 7.5 min topographic quadrangles. Colonies were examined for size, substrate use, and breeding stage. Colony size estimates were rounded off using a graded scale as follows. A total count was made for colonies < 20 pairs. Estimates for colonies > 20 pairs were rounded off using a graded scale: nearest 5 for < 50, nearest 10 for 50 – 200, and nearest 25 for 200 – 450.

SURVEY FINDINGS

The Yadkin-Pee Dee reservoir system between the town of Yadkin above High Rock Reservoir and through Blewett Falls Lake was found to support 7 occupied bald eagle territories that produced 14 chicks and 12 great blue heron colonies that supported 942 pairs of great blue herons and 15 pairs of great egrets. Progress Energy waterways between Falls Dam and Blewett Falls Dam supported 4 bald eagle territories and 2 great blue heron colony with 88 pairs.

Lake Tillery

Two active bald eagle territories were located within Lake Tillery during the 2005 breeding season. A single bald eagle nest (ST-03-01) was located and surveyed within the upper portion of Lake Tillery. The original nest (ST-01-04) within this territory was lost in the spring of 2003. This territory produced 3 chicks. A second, new territory was located by Progress Energy biologists in the lower portion of Lake Tillery. This territory produced 2 chicks. A single great blue heron colony was located in the lower portion of the lake along Cedar Creek. This colony appeared to be new and contained 3 breeding pairs. Although large blocks of land along the lake's east shoreline have been converted to residential development, large blocks of land containing stands of loblolly pine still remain. Particularly in the upper portion of the lake contains extensive tracts of older pines capable of supporting bald eagles. Whether or not an additional territory may be supported in this area depends on the available food supply.

Bald Eagle

Two active bald eagle territories were located within Lake Tillery during the 2005 breeding season. Collectively, these territories produced 5 chicks.

Nest: ST-03-01

Nest Location

This nest is located along the west shoreline below Tater Top Mountain and within the Morrow Mountain State Park boundary (Figure 1). The nest is located just north of the nest (ST-01-04) lost to windthrow along the creek draining into adjacent cove. The nest tree is dead and recessed within moderate sized hardwoods. The nest does not appear to be visible from the lake.

Nesting Activity

Bird Activity - On 6 April, 2005, a single adult was on the nest with 3 chicks. Based on feather condition, the chicks appeared to be approximately 24 days old. On 9 May, 2005, all three chicks were present and standing out on limbs. On this date, no adult was observed in the vicinity.

Nest Condition - On 6 April, 2005, nest was in good structural condition, had a well-formed cup and fresh lining. The nest was of moderate size and shallow. Depth was similar to previous observations indicating that the tree may be constraining depth.

Nest Substrate

Substrate Type - Dead loblolly pine.

Nest Position - Nest was positioned in a shallow top crotch. Surrounding trees were live and of similar height as the nest tree. Nest tree was embedded within a cluster of live hardwoods. Exposure of the nest surface was 100%.

Substrate Condition - Nest tree was dead but maintained most lateral limbs and had most of its bark remaining suggesting that it had been dead less than 1 year. Limbs forming top crotch were present and nearly complete.

Potential Disturbance

Nest tree was positioned with a good visual buffer. Nest is in a fairly remote location but is closer to the shoreline than nest ST-01-04. Potential for disturbance appears to be limited.

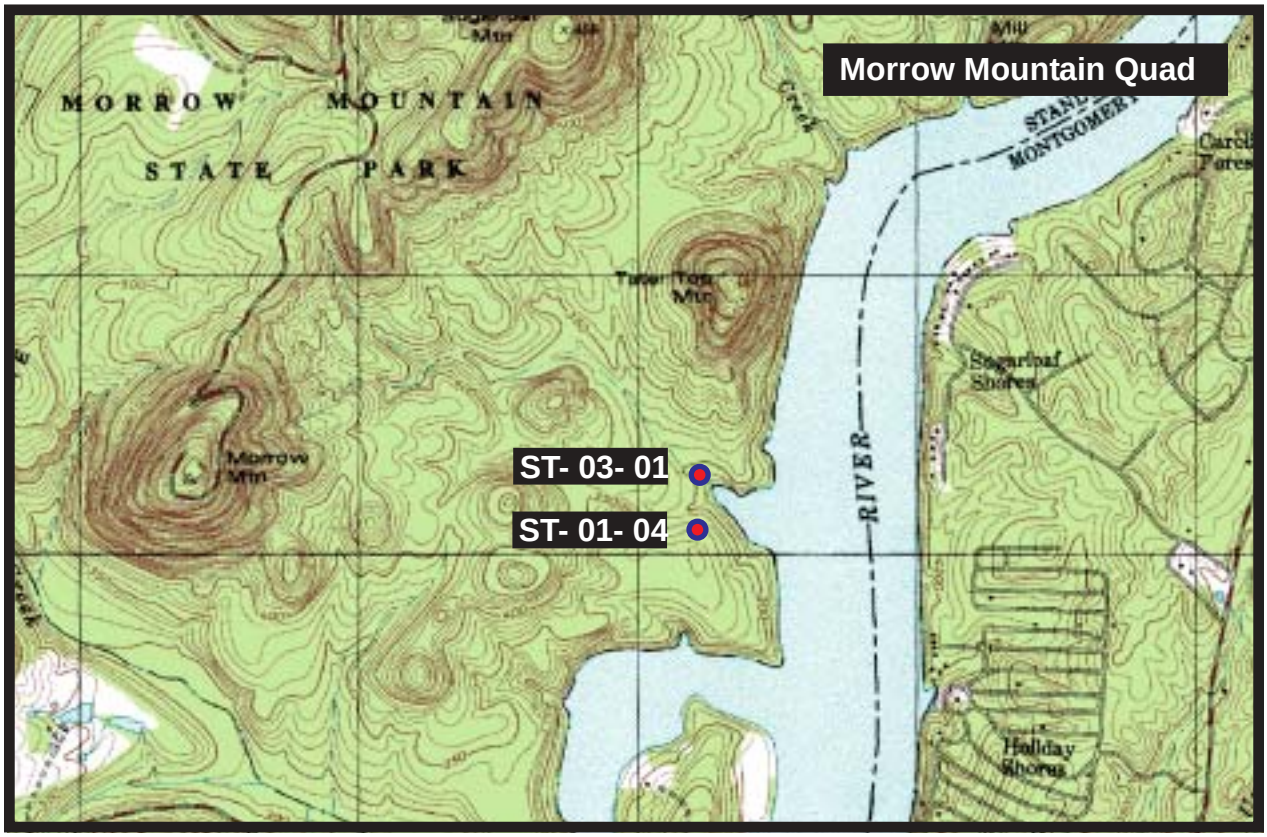

Figure 1. Map location for territory on upper Lake Tillery including original bald eagle nest ST-01-04 and active bald eagle nest ST-03-01.

Figure 2. Aerial photograph of bald eagle nest ST-03-01 (2005; B. Watts).

Nest: MO-05-01

Nest Location

This nest is located along the east shoreline of Lake Tillery west of SR 1111 and directly across the lake from the mouth of Jacobs Creek (Figure 3). The nest tree is a relatively small, live loblolly pine that is surrounded by hardwoods. The nest is likely visible from the lake before leaves emerge in spring.

Nesting Activity

Bird Activity – This nest was located by Progress Energy staff in mid-May of 2005. Staff indicated that the nest was active in 2005 and produced 2 chicks. In July, 2 fledged chicks were observed in the vicinity.

Nest Condition – Photos taken of this nest in May by Progress Energy staff (Figure 4) show that the nest was in good structural condition. Based on structure, the nest appears to be a first-year nest of moderate size. It has a ragged appearance consistent with new construction.

Nest Substrate

Substrate Type – Nest tree was a relatively small, double-trunk, live loblolly pine.

Nest Position – The nest was positioned between the two trunks of a small loblolly on lateral limbs. Construction of nests between two trunks is typically unstable and is a rare position for bald eagles because of their nest size requirements. Nest position was low in the tree with considerable canopy coverage. Sky exposure was low.

Substrate Condition – Nest tree appeared to be in good health.

Potential Disturbance

This nest was not observed during aerial surveys. The nest is likely visible from the lake before leaf out. Access from the upland side appears limited.

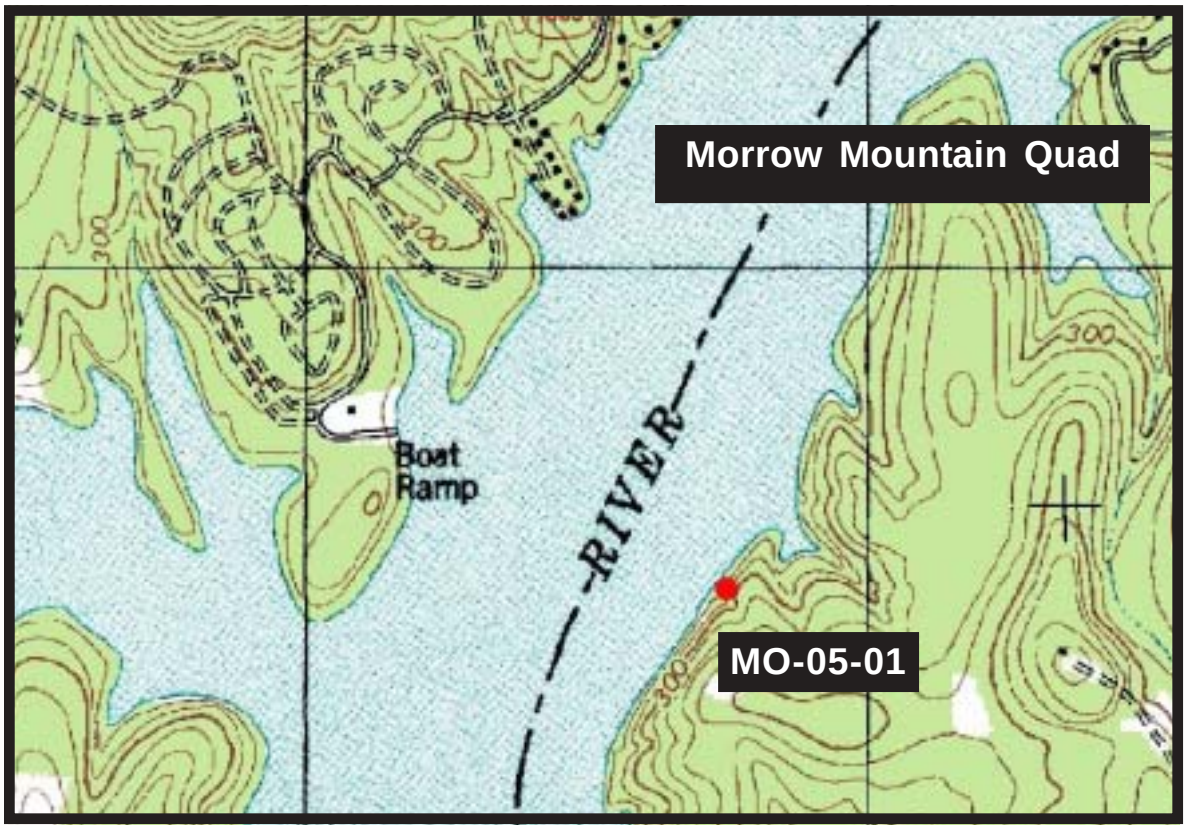

Figure 3. Map location bald eagle nest MO-05-01 on lower Lake Tillery.

Figure 4. Ground photograph of bald eagle nest MO-05-01 showing chick and adult (2005; J. Thigpen).

Great Blue Heron

A single, small colony of great blue herons was located along the shoreline of Cedar Creek. This colony appeared to be new and supported only 3 nesting pairs.

GBH-12

Description

This colony was located in loblolly pines along a point of land in Cedar Creek (Figures 5 and 6). All nests were in loblolly pines surrounded by hardwoods. The colony is completely visible and accessible from the water. On 6 April, 2005, all three pairs were incubating.

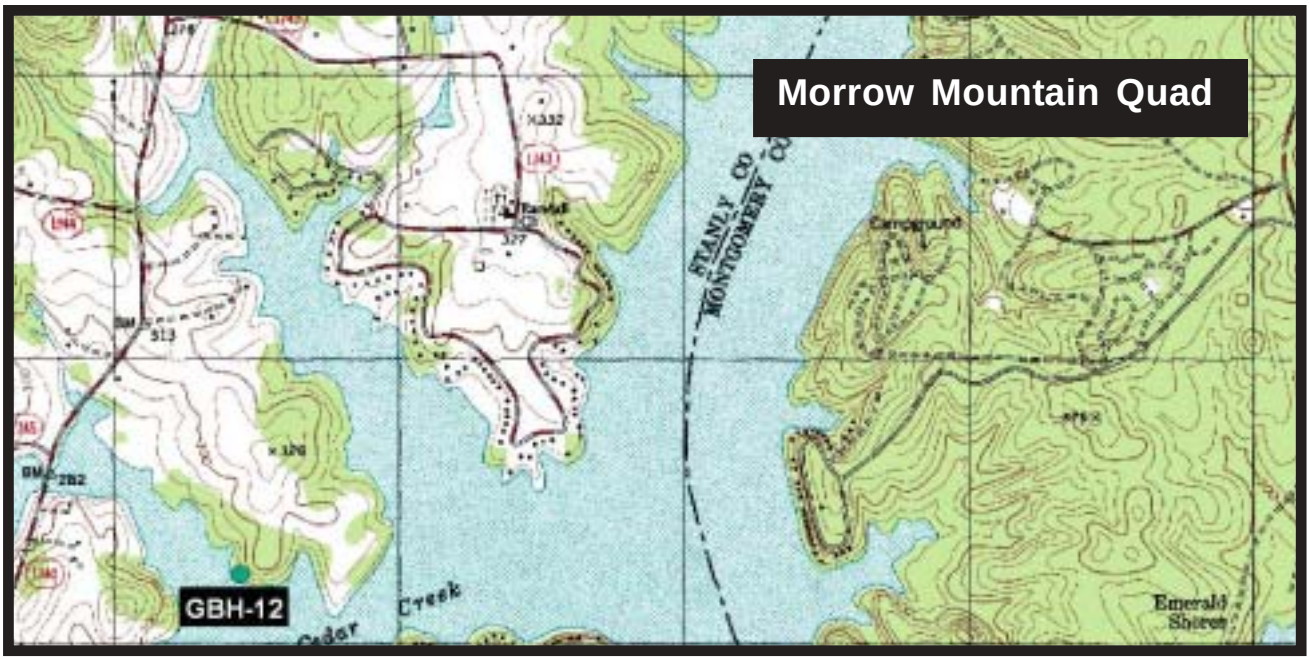

Figure 5. Map location of great blue heron colony GBH-12 on lower Lake Tillery.

Figure 6. Aerial photograph of great blue heron colony GBH-12 on lower Lake Tillery (2005; B. Watts).

Pee Dee River Reach from Tillery Dam to Blewett Falls Lake

This waterway supported one active bald eagle territory below the Norwood Dam. This territory produced 2 chicks. This stretch of river also supported a single great blue heron colony with an estimated 85 breeding pairs.

Bald Eagle

Nest: MO-03-02

Nest Location

This nest is located along the east shoreline of the Pee Dee River below Norwood Dam, south of N.C. Highway 731 (Figure 7). The nest appears to be a replacement nest within the territory of Nest ST-01-03. It is located within a strip of trees along a drainage from an extensive clear cut. The tree strip extends northeast from a transmission line. This nest is not visible from the river but may be seen from the power line right-of-way.

Nesting Activity

Bird Activity – On 6 April, 2005, a single adult was standing on this nest with 2 chicks. Based on feather condition, these chicks appeared to be approximately 6-8 weeks old. On 9 May, 2005, the nest was empty. On this date, 2 young-of-the-year chicks were observed along the shoreline below Norwood Dam. No adults were observed on the second flight.

Nest Condition – On 6 April, 2005, the nest was in good structural condition with a fresh lining. This nest was larger and more substantial than when first observed in 2003.

Nest Substrate

Substrate Type – Live loblolly pine. Nest tree was within a row of trees extending out into a recent clearcut (Figure 8). This configuration is very common and allows good crown access to the nest.

Nest Position – Nest was positioned on a lateral limb up against the main trunk. Nest tree was a single leader so canopy coverage of nest was high. Sky exposure is approximately 15%.

Substrate Condition – Nest tree was live and in good condition.

Potential Disturbance

This nest tree is likely visible from a long distance across the regenerating pine stand. The nest does not appear to be visible from the water. Primary access to the nest site would be along the transmission right-of-way. Disturbance potential appears to be relatively low.

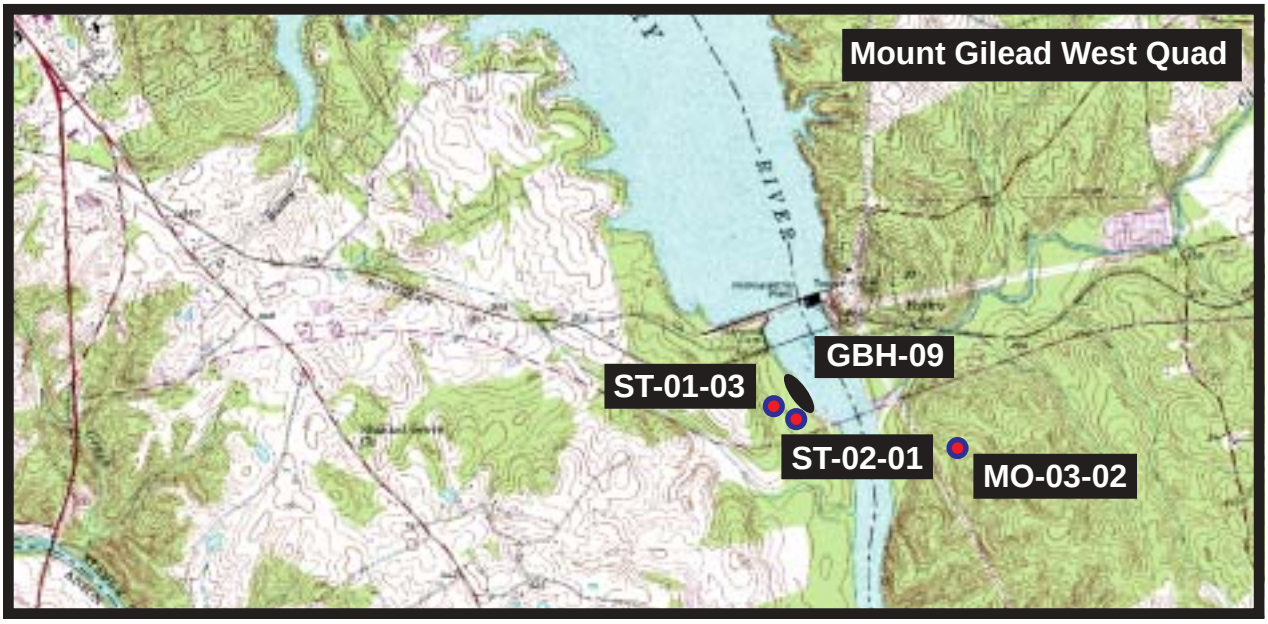

Figure 7. Map location of bald eagle nests ST-01-03 (absent), ST-02-01 (absent), and MO-03-02 (active) and great blue heron colony GBH-09.

Figure 8. Aerial photographs of bald eagle nest MO-03-02 (2005; B. Watts).

Great Blue Heron

A single colony of great blue herons was located below the Norwood Dam. This colony has been present for several years and in 2005 supported an estimated 85 nesting pairs.

GBH-09

Description

This colony was positioned along the west shoreline below the Tillery Hydroelectric Plant (Figure 9). The colony contained 85 pairs of great blue herons. Virtually all of these pairs were nesting in loblolly pines. On 6 April, 2005, 75% of pairs were incubating and the remaining 25% were building nests. The colony appears to be completely visible and accessible from the water.

Figure 9. Aerial photographs of great blue heron colony GBH-09 (2005; B. Watts).

Blewett Falls Lake

One bald eagle nest was located along the shoreline of Blewett Falls Lake. The nest was located just above the Blewett Falls Hydroelectric Plant Dam. It was determined to be active. There are several large blocks of land along Blewett Falls Lake 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 Falls 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.

Bald Eagle

Nest: AN-01-01

Nest Location

This nest is located on a short peninsula along the west shoreline just above the Blewett Falls Hydroelectric Plant Dam (Figure 10). The nest is situated approximately 100 m back from the shoreline in a pine stand that has been thinned and contains scattered pines.

Nesting Activity

Bird Activity – On 6 April, 2005, 2 chicks were standing in the nest. Based on plumage condition, the chicks appeared to be approximately 5-6 weeks old. On 9 May, 2005, birds were perched on limbs in crown suggesting that they were close to fledging age. No adults were detected in surrounding trees.

Nest Condition – On 6 April, 2005, the nest was in good structural condition and had a fresh lining. On 9 May, 2005, there was extensive whitewash around the nest and within the limbs of the crown. On 9 May, 2005, the nest was in poor condition and appeared to be tilted as frequently seen when nests have suffered windthrow damage from storms.

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 (Figure 11). 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. Tree 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 a relatively short distance of power line right-of-way and plant. Nest was likely visible from dam as well as from the lake.

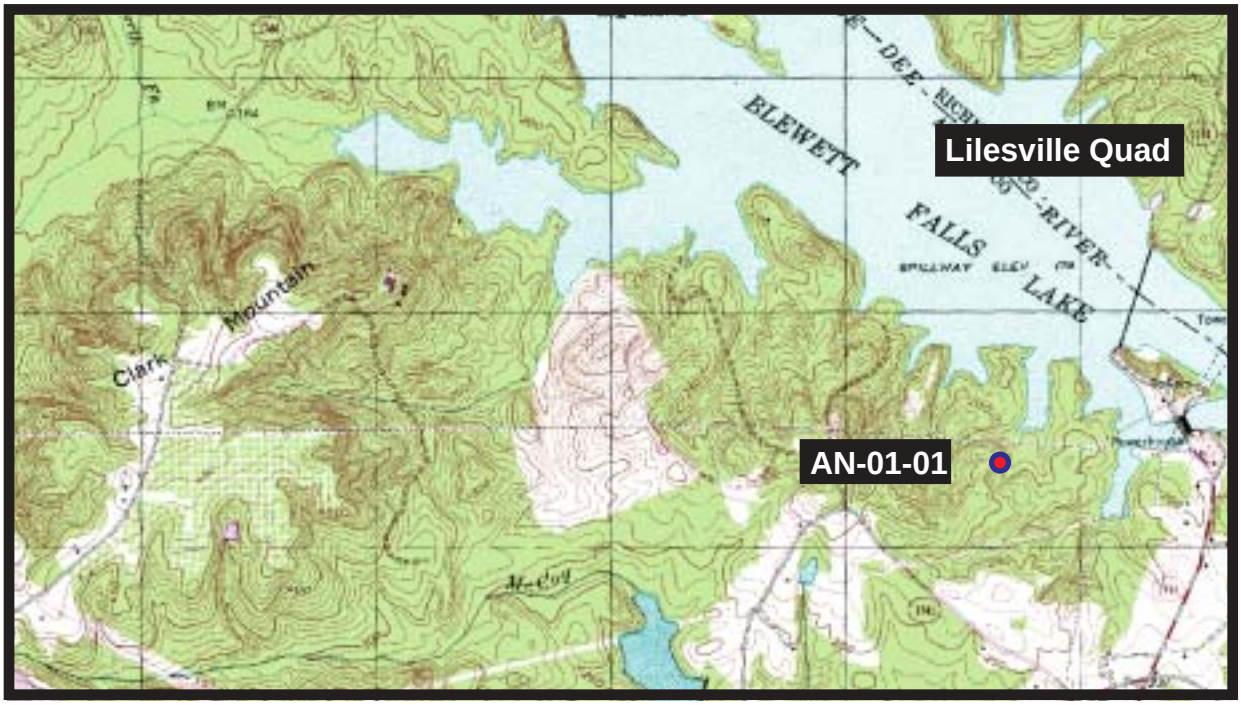

Figure 10. Map location of bald eagle nest AN-01-01.

Figure 11. Aerial photograph of bald eagle nest AN-01-01 (2005; B. Watts).

Summary Table

Table 1. Results of bald eagle surveys for 2001-2005.

River Reach	Year	Pairs	Nests	Status	Young
Lake Tillery					
	2001	1	ST-01-04	Active	1
	2002	1	ST-01-04	Active	1
	2003	1	ST-01-04 ST-03-01	Active Constructed	2 -----
	2005	2	ST-03-01 MO-05-01	Active Active	3 2
Tillery Dam to Blewett Falls Lake					
	2001	1	ST-01-03	Active	2
	2002	1	ST-02-01	Active	0
	2003	1	MO-03-02	Active	1
	2005	1	MO-03-02	Active	2
Blewett Falls Lake					
	2001	1	AN-01-01	Active	2
	2001	1	AN-01-01	Active	2
	2002	1	AN-01-01	Active	2
	2003	1	AN-01-01	Active	1
	2005	1	AN-01-01	Active	3

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Watts, B.D. and D.S. Bradshaw. 2001. An assessment of the bald eagle breeding population along Lake Tillery and Blewett Falls Lake in North Carolina: 2001 breeding season. Center for Conservation Biology Technical Report Series, CCBTR-01-04. College of William and Mary, Williamsburg, VA. 11 pp.

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