

**AN ASSESSMENTT OF THE BALD EAGLE AND GREAT BLUE
HERON BREEDING POPULATIONS ALONG HIGH ROCK,
TUCKERTOWN, NARROWS, AND FALLS RESERVOIRS
IN CENTRAL NORTH CAROLINA: 2004 BREEDING SEASON**



A COOPERATIVE PROJECT BY:

**ALCOA POWER GENERATING INC.
&
CENTER FOR CONSERVATION BIOLOGY
COLLEGE OF WILLIAM AND MARY**

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Final Report

December, 2004

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Recommended Citation:

Watts, B. D. and D. S. Bradshaw. 2004. An assessment of the Bald Eagle and Great Blue Heron breeding populations along High Rock Reservoir, Tuckertown Reservoir, Badin Lake, and Falls Lake in North Carolina: 2004 breeding season. Center for Conservation Biology Technical Report Series, CCBTR-04-10. College of William and Mary, Williamsburg, VA. 23 p.

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TABLE OF CONTENTS

	Page
Background	1
Methods	1
Survey Findings	2
High Rock Reservoir	2
Bald Eagles	2
Great Blue Herons/Great Egrets.....	7
Tuckertown Reservoir	12
Bald Eagles	12
Great Blue Herons	14
Narrows Reservoir	15
Bald Eagles	15
Great Blue Herons	18
Falls Reservoir	21
Bald Eagles	21
Great Blue Herons	23

Cover photo: Aerial view of bald eagle nest location DA-01-01 (B. Watts)

Inset photo: 10 week old bald eagle chick (A.C. Markham)

BACKGROUND

Context

Historically, the Bald Eagle 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 state of North Carolina has seen an increase from no breeding pairs in the late 1960's to approximately 60 pairs as of 2003.

Work conducted by The Center for Conservation Biology in 1995 and 1996 at Alcoa Power Generating Inc.'s (APGI) Yadkin Project (FERC #2197) identified areas of consistent use by eagles in inland areas of North Carolina and suggested that nesting activity should be anticipated in the Yadkin-Pee Dee River basin. A survey of this system in 2001 provided confirmation of these suggestions. Since that survey annual efforts to monitor this population have continued. Results of the 2004 survey follow.

Objectives

The objectives of the eagle survey on Yadkin Project reservoirs were 1) to document the status, distribution and productivity of nesting pairs in association with the Yadkin 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 system of reservoirs.

METHODS

Waterways

Waterways covered by the Bald Eagle survey of 2004 included the four Yadkin Project reservoirs: 1) High Rock Reservoir, 2) Tuckertown Reservoir, 3) Narrows Reservoir, and 4) Falls Reservoir. The survey of High Rock Reservoir included the waterways between, and the mouth of, Grants Creek above I85 and the High Rock Reservoir Dam. The survey of Tuckertown Reservoir included waterways between the High Rock Reservoir Dam and the Tuckertown Dam. The survey of Narrows Reservoir included the waterways between Tuckertown Dam and Narrows Dam. The survey of Falls Reservoir included the waterway between Narrows Dam and Falls 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 1 March 2004.

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 13 May 2004.

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, nearest 25 for 200 – 450.

SURVEY FINDINGS

High Rock Reservoir

Bald Eagles

Only one Bald Eagle territory was observed to be active on High Rock Reservoir during 2004 surveys. This territory contained 2 nests. Nest DA-01-01 was first located and has been active and productive since 2001. It is located on a bluff between the mouths of North Potts Creek and Swearing Creek. This nest was repaired and appeared to have been active in 2004 but no breeding attempt was documented. The sequence of observations suggest that this nest may have been active but failed early or was disturbed and abandoned early in the season. A replacement nest (RO-04-01) was located directly across the reservoir from the existing nest and was determined to be active late in the breeding season. The second territory on High Rock Reservoir containing nest RO-02-01 discovered in 2002 along the south shoreline between Panther Point and Camp Sapona was not determined to be active in 2004. The single nest was blown out of the tree during

the spring of 2002 and has not been rebuilt. No replacement nest has been located for that pair to date. The nest appeared to have been used in 2002 but no direct evidence of a breeding attempt was ever documented. Despite no evidence of re-nesting by that pair, it still seems likely that the territory will be re-occupied or another formed in the southern portion of the reservoir.

NEST: DA-01-01

Nest Code	County	Topo Quad	Active Territory	Active Nest	Chicks Produced
DA-01-01	Davidson	Southmont	Y	N	-----

Nest Location

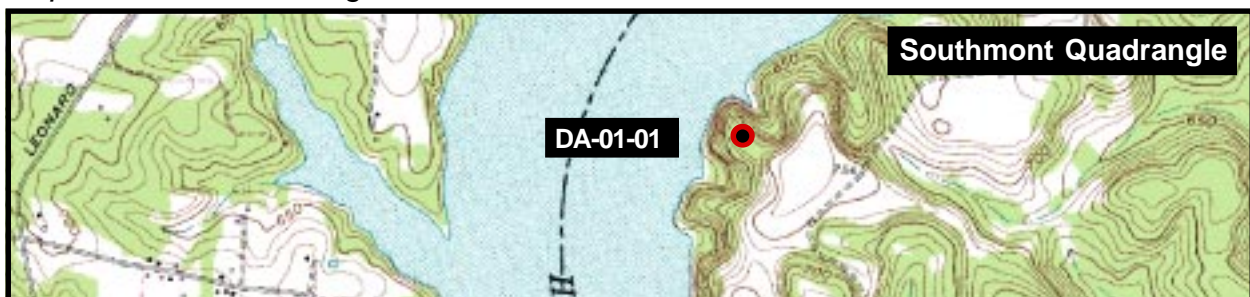
This nest is located along the shoreline almost due east of Trading Ford. The nest tree is positioned on a bluff above the reservoir in a live white oak tree. The nest tree is recessed within the tree cluster such that it is difficult to observe the nest except from directly above. Nest is likely visible from the water within adjacent cove.

Nesting Activity

Bird Activity – On 1 March 2004 inspection of the nest revealed considerable maintenance activity likely conducted through the late fall and winter period. The nest had a new surface of grasses that is characteristic of recent maintenance activity. From these observations it seems clear that there was some intent to utilize this nest during the 2004 season. Whether there was a breeding attempt that failed early or some type of disturbance that caused abandonment can not be determined. The survey did not confirm any breeding attempt on the nest. The pair appears to have relocated across the reservoir (nest RO-04-01) and made a late breeding attempt.

Nest Condition – Nest structure is of moderate size. On 1 March 2004 nest was observed to have a deep cup that was well lined. Nest structure was in very similar condition as observed between 2001 and 2003.

Map location of Bald Eagle nest DA-01-01



Nest Substrate

Substrate Type – Nest was built in a live white oak tree.

Nest Position – Nest is positioned in a deep stable crotch. Nest tree is on a knoll and in a supercanopy position above surrounding trees. Nest has large deciduous crown above such that sky exposure is <20%.

Substrate Condition – Nest tree appears to be in good health with no significant crown damage.

Potential Disturbance

Nest is easily visible before leaf out. However, after leaves emerge, nest has a good visual buffer on all sides. Nest tree is set back from shoreline such that disturbance from water should not be significant. Nest tree is in a fairly remote location with a considerable buffer on upland side. Disturbance potential appears to be limited.

Aerial photo of Nest DA-01-01 facing south toward reservoir (photo 2003: B. Watts).



NEST: RO-04-01

Nest Code	County	Topo Quad	Active Territory	Active Nest	Chicks Produced
RO-04-01	Rowan	Southmont	Y	Y	2?

Nest Location

This nest is located along a creek feeding into a small embayment almost due east of Trading Ford Church and north of Long Ferry Road. The nest is on the west side of the reservoir and southwest of the existing nest DA-01-01. The nest tree is positioned on the outer edge of a streamside forest buffer adjacent to a young regenerating pine stand. The tree does not appear to be visible from the water.

Nesting Activity

Bird Activity – On 1 March 2004 both adults were observed on the nest and the nest was still under construction. The nest was approximately 60% complete with no lining visible. On 13 May 2004 an adult was in incubation posture on the nest. Chicks were not observed during the survey flights. However, reports from local residents indicate that 2 chicks were later observed at the nest site. The nest construction and the late breeding attempt suggest that the pair was relocating from nest DA-01-01 during the breeding season. This supports the suggestion that the pair had failed earlier or been disturbed early in the season from DA-01-01. It is difficult to predict where this pair will nest during the 2005 breeding season.

Nest Condition – Nest structure is of average size and consistent with a newly built nest. On 1 March 2004 nest was incomplete. By 13 May 2004 the nest was complete with a full lining and contained an incubating adult.

Nest Substrate

Substrate Type – Nest was built in a live loblolly pine tree. The tree was in a supercanopy position at the edge of a regenerating pine stand.

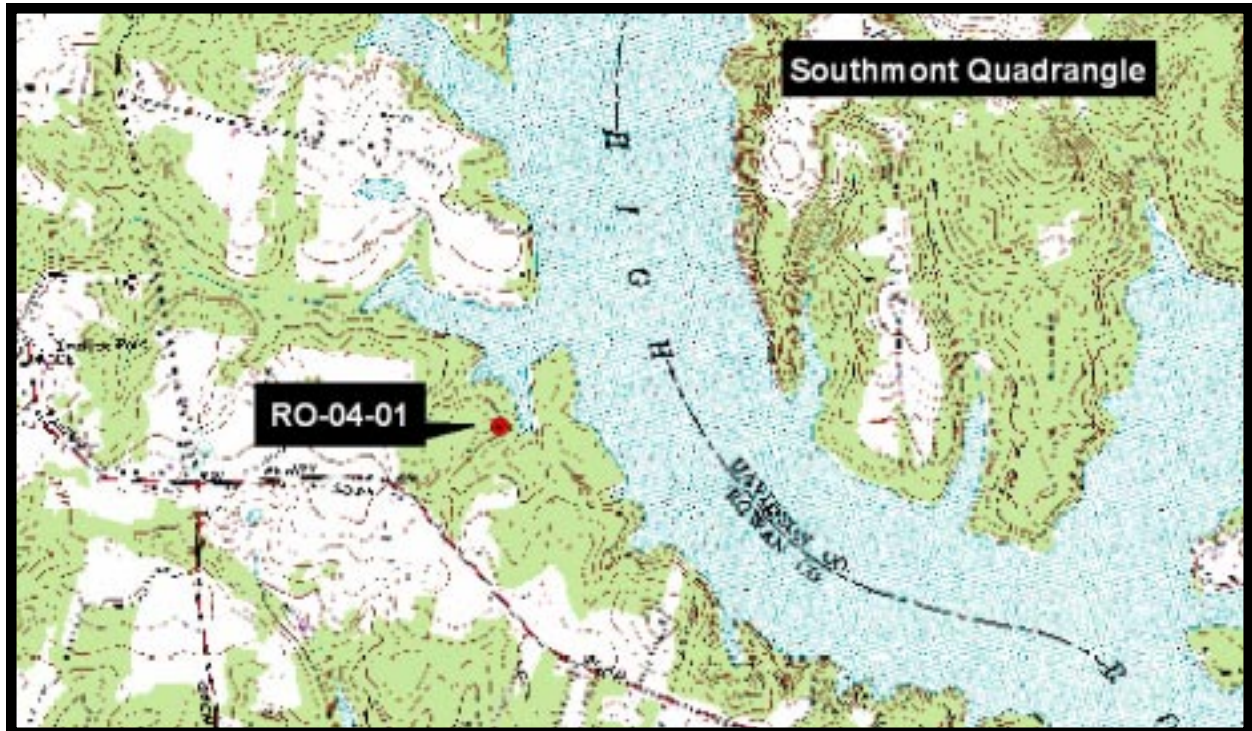
Nest Position – Nest is built in a stable, triple-prong top crotch. Nest has a moderate crown above but sky exposure is more than 50%.

Substrate Condition – Nest tree appears to be in good health with no significant crown damage.

Potential Disturbance

Nest site appears to be protected by a visual buffer from the reservoir and is isolated across a regenerating stand from road access. Potential for disturbance is limited at this site.

Map location of Bald Eagle nest RO-04-01.



Aerial photo of nest RO-04-01 facing north (photo 2004; B. Watts)



Great Blue Herons/Great Egrets

Five breeding colonies of Great Blue Herons were detected on High Rock Reservoir. All but 1 of these colonies were located on small, forested islands isolated from the shoreline. Colony size ranged from 4 to 455 pairs. Total population estimate for this reservoir was 563 breeding pairs. For the first time since monitoring began in 2001, Great Egrets were found nesting on the reservoir. Pairs were mixed in with the largest colony of Great Blue Herons on the settling pond north of Trading Ford. Total population estimate for Great Egrets was 15 breeding pairs.

GBH-01

Code	County	Topo Quad	Pairs
GBH-01	Davidson	Southmont	43

Description

This colony was located on a small island near the Route 8 bridge in the mouth of Abbotts Creek. The island had a mixed stand of loblolly pines and hardwoods. Nests were built in both pines and hardwoods. On 13 May 2004 75% of nests had small young and the remaining 25% had larger young.

Map location of Great Blue Heron colony GBH-01



Aerial view of Great Blue Heron colony GBH-01 (Photo 2002; B. Watts)



GBH-02

Code	County	Topo Quad	Pairs
GBH-02	Rowan	Southmont	440-GBHE, 15-GREG

Description

This colony was located along the western edge of one of Duke Power's settling ponds just north of the town of Trading Ford. The pond was lined with a mixed stand of hardwoods and pines. A larger stand of pure loblollies was positioned further from the pond edge. Nests were built along the pond margin in both hardwoods and pines and throughout the pure pine stand. Nests distribution continued to be more restricted as in 2003 due to partial harvest of pine stand in 2002. On 1 March 2004 75% of Great Blue Herons had large young and 25% had small young. Great Egrets were nesting in the core of the subcolony occupying the pure pine stand. On 1 March 2004 all Great Egret pairs were incubating.

Map location of Great Blue Heron Colony GBH-02



Aerial view of Great Blue Heron colony GBH-02 (Photo 2002; B. Watts)



GBH-03

Code	County	Topo Quad	Pairs
GBH-03	Rowan	Southmont	33

Description

This colony was located on a small, forested island in the mouth of Second Creek. The island was forested with a middle-aged loblolly pine stand. This colony changed from 21 nests in 2002 to 38 nests in 2003 to 33 nests in 2004. During 2004, all nests were built in pine trees. On 13 May 2004, approximately 80% of pairs had large chicks and the remaining 20% had small chicks.

Map location of Great Blue Heron colony GBH-03**GBH-06**

Code	County	Topo Quad	Pairs
GBH-06	Rowan	Southmont	44

Description

This colony was located on a small forested island within Swearing Creek just above the Linwood Southmont Road bridge. The island was forested with a middle-aged pine stand. On 13 May 2004 there were 44 nesting pairs present. An estimated 50% had large young, 40% had small young, and 10% were incubating.

Map location of Great Blue Heron colony GBH-06



Aerial view of Great Blue Heron colony GBH-06 (Photo 2004; B. Watts)



GBH-07

Code	County	Topo Quad	Pairs
GBH-07	Rowan	Grist Mountain	4

Description

This colony was located on a small forested island within Abbotts Creek off shore of a small development at the end of Route 2373. The island was forested with a mix of pine and hardwood. On 13 May 2004 there were 4 pairs nesting on the island, all with small chicks.

Map location of Great Blue Heron colony GBH-07

**Tuckertown Reservoir****Bald Eagles**

A single Bald Eagle nest was observed within the Tuckertown Reservoir system for the third year. The nest was located within the upper section just downstream of the High Rock Dam.

NEST: RO-02-02

Nest Code	County	Topo Quad	Active Territory	Active Nest	Chicks Produced
RO-02-02	Rowan	High Rock	Y	Y	1

Nest Location

This nest was located along the south shoreline just down from Cedar Creek. The nest tree is isolated within a recently clearcut area of private land above a farm. The tree is set back from the shoreline with a buffer strip of trees between the nest tree and the shoreline. The nest is not likely visible from the water due to tree buffer. The nest is likely visible from route 2152.

Nesting Activity

Bird Activity – On 1 March 2004 an adult was observed incubating on the nest. On 13 May 2004 a single chick was observed on the nest with no attending adult. Based on plumage characteristics, the chick appeared to be approximately 48 days old.

Nest Condition – Nest structure was of moderate size and appeared to be the same size as when observed in 2003. On 1 March 2004 nest was in good condition with a complete lining.

Nest Substrate

Substrate Type – Nest was built in an isolated loblolly pine. Nest tree was a specimen loblolly in an ideal condition to be used for a nest tree.

Nest Position – Nest was positioned in a top crotch deep below the crown. This configuration is the most common and apparently most stable position for eagle nests. the very top of the tree crown. Nest was under large crown with less than 20% sky exposure.

Substrate Condition – Nest tree appeared to be in good condition with no evidence of crown damage.

Potential Disturbance

Nest tree is in a fairly remote location with a considerable buffer on upland side and tree buffer on water side. Disturbance potential appears to be limited.

Map location of Bald Eagle nest RO-02-02



Aerial view of location of Bald Eagle nest RO-02-02 (Photo 2003: B. Watts)



Great Blue Herons

A single colony of breeding Great Blue Herons was detected on Tuckertown Reservoir on an island just below the High Rock Dam. Total population estimate for this reservoir is 75 pairs.

GBH-04

Code	County	Topo Quad	Pairs
GBH-04	Davidson	High Rock	75

Description

This colony was located on a small forested island and the adjacent forested shoreline just below the High Rock Dam. This island is long and linear and contains a mixed stand of hardwoods and pines. The adjacent shoreline is pine-dominated. There were 2 sub-colonies within this location. The larger sub-colony contained 60 pairs and was within the pines along the shoreline. The second sub-colony was on the island and contained 15 pairs. On 13 May 2004 approximately 75% of pairs had large young, 10% had small young, and 15% were incubating.

Map location of Great Blue Heron colony GBH-04



Narrows Reservoir

Bald Eagles

Two Bald Eagle nests were located along the shoreline of Narrows Reservoir. The older nest (ST-01-01) was located along the edge of a canal behind Graveyard Island. The new nest (MO-03-01) is located across the river on Uwharrie National Forest.

NEST: ST-01-01

Nest Code	County	Topo Quad	Active Territory	Active Nest	Chicks Produced
ST-01-01	Stanly	Badin	N	N	-----

Nest Location

This nest was located along the edge of a canal just behind Graveyard Island. The nest was positioned within the first row of trees along the shoreline. Surrounding trees were of similar age and height. However, the position of the nest tree on the edge allowed direct access to the nest from the water side. This nest would be visible from the water on the canal or on the main stem of Narrows Reservoir. The nest would also be visible from the railroad tracks on the opposite side of the canal.

Nesting Activity

Bird Activity – There was no indication that this nest had been maintained during the past year. Nest does not appear to be in use. New nest (MO-03-01) in this territory appears to be the focal nest.

Nest Condition – On 1 March 2004 this nest was in poor condition and did not appear to have been worked on during the past year. The nest is now a $\frac{3}{4}$ remnant with no lining.

Nest Substrate

Substrate Type – The nest was built in a live loblolly pine.

Nest Position – Nest is positioned in a shallow crotch very near the top of the crown. Supporting limbs were widely splayed such that sky exposure was approximately 80%.

Substrate Condition – Nest tree appeared to be in relatively good condition.

Potential Disturbance

Nest tree was not protected by a visual buffer and was easily visible from water and railroad tracks. It is not clear if nest is directly visible from residential area near Palmer Island. Nest was protected by extensive forest buffer on upland side and by railroad tracks and canal on the lake side. Access to nest tree would be fairly difficult from both land and water. Disturbance appears to be limited.

Map location of Bald Eagle nest ST-01-01



Aerial view of location of Bald Eagle nest ST-01-01 (Photo 2002: B. Watts)



MO-03-01

Nest Code	County	Topo Quad	Active Territory	Active Nest	Chicks Produced
MO-03-01	Montgomery	Badin	Y	Y	1

Nest Location

This nest was located along on a bluff set back from the shoreline on Uwharrie National Forest. The nest tree was within a scattered stand of supercanopy trees. The nest does not appear to be visible from the water along the shoreline but may be visible from logging road 6558.

Nesting Activity

Bird Activity – On 1 March 2004 a single chick was observed standing in the nest and being attended by one adult. Based on the appearance of feathers, the chick was estimated to be approximately 25 days old. On 13 May 2004 the nest was empty and no birds were observed in the immediate territory. It was assumed that this bird had fledged.

Nest Condition – Nest structure is of moderate size but appeared to be built up and more consolidated compared to 2003. On 1 March 2004 the nest was in good structural condition and had a well-formed lining.

Nest Substrate

Substrate Type – The nest was built in a live loblolly pine.

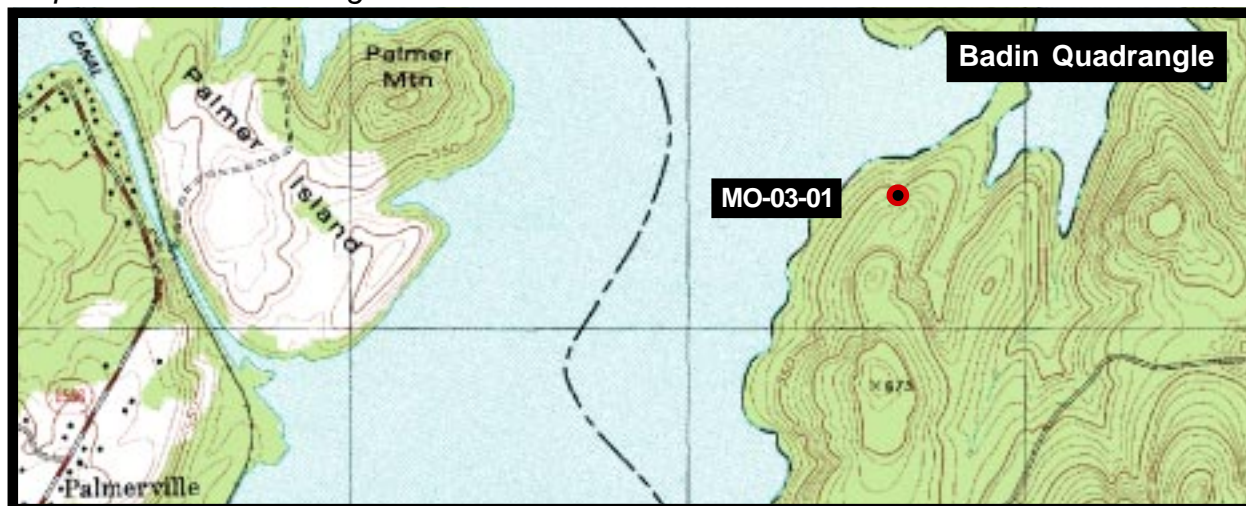
Nest Position – Nest is positioned on a lateral limb up against the trunk. Crown limbs are fairly sparse such that sky exposure was 70%.

Substrate Condition – Nest tree appeared to be in relatively good condition.

Potential Disturbance

Nest tree was protected by a visual buffer of scattered trees. It does not appear to be visible from shoreline but may be seen and accessed from nearby logging road.

Map location of Bald Eagle nest MO-03-01.



Aerial photos showing location of Bald Eagle nest MO-03-01. Top photo facing WNW with Palmer Mtn on left of background; bottom photo facing NNE toward neck of Pear Tree Island. (Photos 2003: B. Watts)



Great Blue Herons

Two colonies of breeding Great Blue Herons were detected within Narrows Reservoir during 2004. One colony was on an island at the confluence of Beaverdam and Reynolds Creeks and the second was on an island between Graveyard Island and Palmer Island. Total population estimate for this reservoir was 118 pairs.

GBH-05

Code	County	Topo Quad	Pairs
GBH-05	Montgomery	Badin	110

Description

19

This colony was located on a small forested island near the Pine Haven residential development at the confluence of Beaverdam and Reynolds Creeks. The drainage is highly developed in this area with considerable boat traffic. The island supports a middle-age stand of loblolly pines that has numerous canopy gaps. Nests were built throughout the stand. The colony was estimated to contain 110 pairs in 2004 compared to 140 and 185 pairs in 2002 and 2004 respectively. On 13 May 2004 approximately 75% of pairs had large chicks, 15% had small chicks, and 10% were incubating.

Aerial view of Great Blue Heron colony GBH-05 (Photo 2002: B. Watts)



Map location of Great Blue Heron colony GBH-05



GBH-08

Code	County	Topo Quad	Pairs
GBH-08	Stanly	Badin	8

Description

This colony was located on a small forested island along the western shoreline of Badin Lake between Graveyard Island and Palmer Island. The island is well isolated from shoreline but subject to regular boat traffic. Nests were in a small cluster built in loblolly pines along the east side of the island. On 13 May 2004 all pairs had small chicks.

Map location of Great Blue Heron colony GBH-08.



Falls Reservoir

Bald Eagles

A single Bald Eagle nest was located along the shoreline of Falls Reservoir. This nest was located along the reservoir shoreline east of the town of Badin. The nest appeared to be in good condition and to have had recent work but no nesting attempts were documented. The short waterway comprising Falls Reservoir appears to be an ideal breeding location for Bald Eagles. The area is remote with extensive forest cover. Many trees are available that are large enough to support a nest structure. The two dams in close proximity would likely provide good foraging opportunities. Due to the small size of this waterway, it is unlikely that more than one eagle pair could be accommodated. Future work should monitor this territory for breeding activity.

NEST: ST-01-02

Nest Code	County	Topo Quad	Active Territory	Active Nest	Chicks Produced
ST-01-02	Stanly	Badin	N	N	-----

Nest Location

The Bald Eagle nest within Falls Reservoir was located on a steep embankment along the shoreline just east of the town of Badin. The nest tree was located in a small grove of 8-10 old supercanopy pines surrounded by younger growth. This nest has an extensive forest buffer on all sides and may not be visible from any access points. The nest is accessible from the loop road that comes from route 1704.

Nesting Activity

Bird Activity – This nest was located on 27 March 2001. Although the nest was in good structural condition when examined on 23 April 2002, again on 2 April, 2003, and again on 1 March 2004, there was no indication that the surface of the nest had been worked during this time. No birds were present within the area. This nest appears to be abandoned.

Nest Condition – Nest structure is of fairly large size and was in good structural condition during both observations. Nest still had recognizable cup but no recent lining.

Nest Substrate

Substrate Type – The nest was built in a dead loblolly pine. The tree was one of several old seed trees left over a regenerating stand. These trees were in a supercanopy position over surrounding forest. Crown access for birds to the nest was very good.

Nest Position – Nest is positioned in a deep top crotch. Nest appeared to be in a very solid position. Because limbs were dead, sky exposure was 100%.

Substrate Condition – Nest tree was dead but limbs forming top crotch were complete. Nest tree was missing more than 50% of its bark.

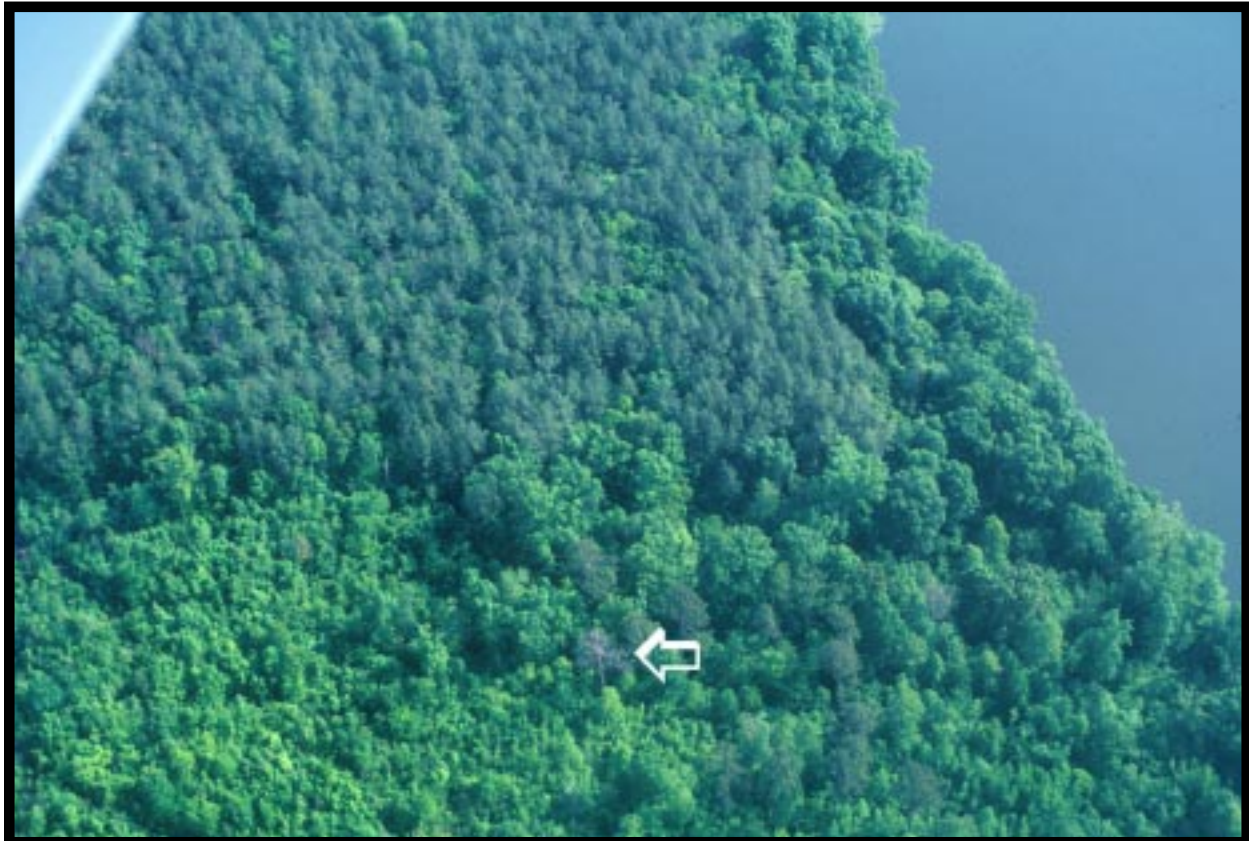
Potential Disturbance

Nest tree was protected by a visual and structural buffer on all sides. Location is fairly remote and access is somewhat difficult from nearby roadway. Disturbance potential appears to be very limited.

Map location of Bald Eagle nest ST-01-02



Aerial view of location of Bald Eagle nest ST-01-02 (Photo 2002: B. Watts)



Great Blue Heron

No Great Blue Heron colonies were detected on Falls Reservoir. Nesting habitat is fairly limited on this waterway. The small forested islands located on the upper reach are the most likely location for future breeding. However, potential for colonization appears limited.