AGENDA
N.C. WILDLIFE RESOURCES COMMISSION
July 13, 2023, 9:00 a.m.
1751 Varsity Drive
NCWRC Conference Room, 5th Floor
Raleigh, North Carolina

CALL TO ORDER – *Chairman Monty Crump*

This electronic meeting is being streamed live for the public to attend and recorded as a public record. The recording of the meeting will be available at www.ncwildlife.org.

PLEDGE OF ALLEGIANCE – *Commissioner Tom Berry*

INVOCATION –*Commissioner Landon Zimmer*

ROLL CALL OF COMMISSIONERS PRESENT – *Margo Minkler, Commission Liaison*

MANDATORY ETHICS INQUIRY – North Carolina General Statute §138A-15 mandates that the Commission Chair shall remind all Commissioners of their duty to avoid conflicts of interest and appearances of conflict under this Chapter, and that the chair also inquires as to whether there is any known conflict of interest or appearance of conflict with respect to any matters coming before the Commission at this time. It is the duty of each Commissioner who is aware of such personal conflict of interest or of an appearance of a conflict to notify the Chair of the same. *Chairman Crump*

APPROVAL OF APRIL 20, 2023 MEETING MINUTES – Take action on the April 20, 2023 Wildlife Resources Commission meeting minutes as written in the exhibit. **(EXHIBIT A)**

APPROVAL OF JUNE 6, 2023 MEETING MINUTES – Take action on the June 6, 2023 Wildlife Resources Commission meeting minutes as written in the exhibit. **(EXHIBIT B)**

FINANCIAL STATUS REPORT – Receive Financial Status Report on the Wildlife Resources Commission General Fund, Capital Improvement Fund, and the Endowment Fund. – *Jason Cottle, Chief Financial Officer* **(EXHIBIT C)**

COMMITTEE MEETING REPORTS

Executive Committee Report – July 12, 2023 – *Monty Crump, Chair*
Habitat, Nongame & Endangered Species Committee – July 12, 2023 – *Kelly Davis*
Fisheries Committee Report – July 12, 2023 – *John Stone, Chair*
Land Acquisitions & Property Committee Report – July 12, 2023 – *Tom Berry, Chair*

Small Game & Wild Turkey Committee Report – July 12, 2023 – *Jim Ruffin, Chair*
Big Game Committee Report – July 12, 2023 – *David Hoyle, Chair*
Committee of the Whole Report – July 12, 2023 – *Monty Crump, Chair*

AGENCY SPOTLIGHT – WISe, Partnerships, and other Notable Engineering Projects**–** *Michael Leggett, Facility Construction Engineer*

LAND ACQUISITION AND PROPERTY MATTERS

Phase II Land Acquisition – Consider final approval to proceed with acquisition of the following properties – *Ben Solomon, Assistant Chief and Land Acquisition Manager* (**EXHIBITS D-1, D-2, D-3, D-4, D-5)**

- Kelly Cove Tract – Macon County **(D-1)**
- Griffin Tract – Buncombe County **(D-2)**
- Richardson Tract – Ashe County **(D-3)**
- Spencer Bay Tracts – Hyde County **(D-4)**
- Paynes Branch Tract – Forsyth County **(D-5)**

Other Property Matters – Consider approval of the following other property matters - *Ben Solomon* (**EXHIBITS E-1, E-2)**

- Request for Easement – Request to grant a conservation easement on the North Bend Boating Access Area in Burke County **(E-1)**
- Request for Easement – NC DOT requests to purchase a permanent right of way easement, drainage easement, utility easement and temporary construction easement for a bridge project in Henderson County **(E-2)**

RULEMAKING

Permanent Rulemaking Adoption – 10B .0113 Big Game Harvest Reports – Review public comments and consider request to adopt proposed changes to Big Game Harvest reporting –*Melva Bonner, Regulatory Analyst* **(EXHIBITS F-1, F-2)**

Permanent Rulemaking Adoption – 10F .0100 Motorboat Registration – Review public comments and consider request to adopt proposed changes to 10F .0102, .0104, and .0109 to update vessel data collection and certificate of number requirements to comply with USCG regulations – *Melva Bonner* **(EXHIBITS G-1, G-2)**

Permanent Rulemaking Notice of Text – CWD Rules – Consider request to publish Notice of Text with an open comment period and a public hearing for proposed rules 10B .0501 and .0503. Review and consider approval of fiscal note. – *Brad Howard, Wildlife Management Division Chief* **(EXHIBITS H-1, H-2)**

WATER SAFETY RULEMAKING

Permanent Rulemaking Adoption – 15A NCAC 10F .0310 Dare County – Review public comments and consider final adoption of amendments to establish a no-wake zone in the waters of Motts Creek

at the Oregon Inlet Fishing Center and Marina and Oregon Inlet U.S. Coast Guard Station at Cape Hatteras National Seashore; and to add names and addresses of the boating access areas in Dare County – *Betsy Haywood, Water Safety Rules Coordinator* **(EXHIBITS I-1, I-2)**

Permanent Rulemaking Adoption – 15A NCAC 10F .0374 Cube Hydro Carolinas – Review public comments and consider final adoption of amendments to change the name of Cube Yadkin Generation to Cube Hydro Carolinas; to establish safety zones and restricted areas on the Yadkin River in Rowan, Davidson, Stanly and Montgomery counties at High Rock Hydroelectric Station, Tuckertown Hydroelectric Station, Narrows Hydroelectric Station, and Falls Hydroelectric Station; to prohibit swimming at restricted areas; and to prohibit discharge of a firearm in restricted areas – *Betsy Haywood* **(EXHIBITS J-1, J-2)**

Temporary Rulemaking Adoption – 15A NCAC 10F .0305 Brunswick County – Review public comments and consider final adoption of a temporary amendment to establish a no-wake zone in South Jinks Creek at the Town of Sunset Beach, beginning at a line north of the feeder channel and including waters south and west for the duration of a dredging project in the navigation channels – *Betsy Haywood* **(EXHIBITS K-1, K-2)**

Permanent Rulemaking Notice of Text – 15A NCAC 10F .0333 Mecklenburg and Gaston Counties – Consider application from the Lake Wylie Marine Commission to publish Notice of Text in the North Carolina Register, with open comment period and one public hearing, to establish a restricted area with swim beach at the South Point Access Area on Lake Wylie, located at 199 Boat Launch Road in Belmont in Gaston County, north of a rope in a cove east of the access area; and to codify in the North Carolina Administrative Code the address of the no-wake zone within 50 yards of the South Point Access Area boat ramps – *Betsy Haywood* **(EXHIBIT L)**

WILDLIFE MANAGEMENT DIVISION

CONSERVATION PLANS – Consider staff recommendations for final adoption of two Species Conservation Plans –*Dr. Sara Schweitzer, Wildlife Diversity Program Coordinator* **(EXHIBITS M-1, M-2)**

- Bog Turtle **(M-1)**
- Southern Hognose Snake **(M-2)**

INLAND FISHERIES DIVISION

Town of Black Mountain – Mountain Heritage Trout City Request – Consider designating the Town of Black Mountain as a Mountain Heritage Trout City and recognizing the Public Mountain Trout Waters within Black Mountain as Mountain Heritage Trout Waters **(EXHIBIT N)** – *Christian Waters, Inland Fisheries Division Chief*

ELECTION OF OFFICERS - Pursuant to North Carolina General Statute § 143-243, at the first scheduled meeting of the Commission after July 1 of each odd-numbered year, the Wildlife Resources Commission shall select from among its membership a chairman and a vice chairman who shall serve for terms of two years or until their successors are elected and qualified.

- **Vote for Vice Chairman**
- **Vote for Chairman**

COMMENTS BY THE CHAIRMAN

COMMENTS BY THE EXECUTIVE DIRECTOR – *Executive Director Ingram*

ADJOURN

EXHIBIT A

MINUTES
April 20, 2023
N.C. Wildlife Resources Commission Meeting
Raleigh, North Carolina

Chairman Monty Crump called the April 20, 2023 N.C. Wildlife Resources Commission meeting to order at 9:00 a.m. in the Commission Room at the agency's headquarters in Raleigh. Crump reminded everyone that the meeting is being audio streamed live and will be available at www.ncwildlife.org.

Commissioner John Coley led the Pledge of Allegiance.

Commissioner John Alexander gave the invocation.

ROLL CALL

Margo Minkler, *Commission Liaison*, called the roll. Hayden Rogers and Landon Zimmer were absent.

COMMISSIONER ATTENDANCE

Monty Crump	Wes Seegars	Jim Ruffin	John Stone	Mike Alford
Thomas Fonville	Mark Craig	Ray Clifton	John Alexander	
David Hoyle	Tom Berry	Kelly Davis	Tom Haislip	
John Coley	Brad Stanback	Steve Windham	JC Cole	

VISITORS

Shawn Horsley, NC Handicapped Sportsmen

Tim Gestwicki, NCWF

Manley Fuller, NCWF

MANDATORY ETHICS INQUIRY

Chairman Crump advised the Commission of the mandatory ethics inquiry as mandated in NCGS §138A-15.

MINUTES

On a motion by David Hoyle and second by John Coley, the Commission approved the Minutes of the following meetings:

FEBRUARY 23, 2023 MEETING – the Wildlife Resources Commission Minutes of the February 23, 2023 meeting was approved as presented in **EXHIBIT A**.

MARCH 30, 2023 MEETING – the Wildlife Resources Commission Minutes of the March 30, 2023 meeting was approved as presented in **EXHIBIT B**.

EXHIBITS A & B are incorporated into the official record of this meeting.

ADMINISTRATION

Jason Cottle, *Chief Financial Officer*, presented a status report in **EXHIBIT C** on the Wildlife Resources Commission General Fund, Capital Improvement Fund, and the Endowment Fund.

EXHIBIT C is incorporated into the official record of this meeting.

ENDOWMENT FUND EXPENDABLE INCOME ALLOCATION – On a motion by Brad Stanback and second by Steve Windham, the Commission approved the Calendar Year 2022 Investment Income Allocation presented in **EXHIBIT D** by *Jason Cottle*

EXHIBIT D is incorporated into the official record of this meeting.

COMMITTEE MEETING REPORTS

Migratory Birds & Waterfowl Committee Report – April 19, 2023 – *John Coley, Chair*, reported the Committee met on April 19, 2023 and received information from *Doug Howell¸ Migratory Game Bird Coordinator*, on the federal migratory bird hunting season frameworks and staff recommendations for migratory bird hunting seasons including the special falconry season. *Brad Howard, Wildlife Management Division Chief,* presented the committee with staff recommendations regarding peregrine falcon take for use in falconry. *Doug Howell* and *Dr. Christina Watkins*, *Lead Social Scientist,* presented interesting information from the recent dove hunter survey which generated much discussion about dove populations and dove hunting. Commissioners discussed the decades long decline in the estimated dove population, and *Doug* shared that the Eastern Dove Management Unit of the Flyways have almost completed their new population model that should shine more light on the current trends in dove numbers. We look forward to seeing the results of the new model within the next year. Having no further business, the Committee was adjourned.

Education & Communication Committee Report – April 19, 2023 – *Kelly Davis, Chair*, reported the Education & Communication Committee met April 19, 2023. Staff presented an update on their work towards fishing and aquatic education goals and various angler Recruitment and Retention initiatives. As part of the realignment of the Wildlife Education Division, the Fishing and Aquatic Education team was established from feedback received by constituents and partners during the Wildlife Education Division's Pathway to Wildlife Relevancy Project. The team offers recruitment, retention, and reactivation programming based on the Outdoor Recreation Adoption Model to engage and maintain anglers in conservation with social support. The committee also received an update on two R3 partnerships raising fishing awareness and participation from the Wildlife Education Division's Program Development and Operations team. The Tackle Loaner Program has received a rebranding over the last year, and several new partner sites have stepped forward to participate as a result. The Commission has also deployed a Mobile First Catch Center trailer fully stocked with tackle from the Recreational Boating and Fishing Foundation to assist with engagement efforts in underserved communities.

Land Acquisitions & Property Committee Report – April 19, 2023 – *Tom Berry, Chair,* reported the Land Aquisitions Committee met on April 19, 2023. The Committee reviewed and endorsed eight Phase I proposals, eight Phase II proposals, as well as three Other Property Matters. In total, the Committee reviewed 16 land acquisition proposals and a total of 6,871 acres. Proposals ranged from new depot sites critical for future operations, public fishing and boating access areas, a waterfowl impoundment, as well as two potential new game lands in underserved areas. Adding new game land in underserved regions of the state has been a priority of the Committee for several years. An overview of recent land acquisition projects completed in the time frame of 2015-2022 was presented to provide a picture of WRC's land acquisition successes over the years. A total of 132 land acquisitions were completed in that window of time, totaling just over 62,000 acres. A dashboard was also shared displaying a breakdown of lands managed by WRC. In total, WRC manages just over 2.1 million acres of game land. Of these 2.1 million acres, 547,700 acres are owned by WRC, and the remaining 1,552,300 acres are owned by federal agencies, local governments, and private entities. *Chairman Berry* concluded the meeting by mentioning an initiative to review current game lands for access needs. This will involve staff developing an approach to review and identify assess needs on game lands and reporting back to the Committee with findings at a later date.

Finance Committee Report – April 19, 2023 – *Landon Zimmer, Chair,* reported the Finance Committee met on April 19, 2023. *Jason Cottle, Chief Financial Officer,* presented a comparison of the current and prior fiscal years' year to date activity in receipt and expenditure categories in the General and Capital Improvement Funds, and an explanation was offered for any variances in excess of one million dollars. The Committee also reviewed the balances and Asset Allocation of the Endowment Fund as of February 2023. Finally, the Committee recommended approving that no expendable income was earned in calendar year 2022 as presented in Exhibit D. *Steve Chase, Internal Auditor,* presented the following topics: WRC Internal Audit Charter, Bank of America Works Implementation project, Civil Rights Reviews, WRC Travel Review, and WRC Internal Audit Staffing.

Committee of the Whole Report – **April 19, 2023** – *Monty Crump, Chair*, reported the Committee of the Whole met April 19, 2023. *Carrie Ruhlman, Rulemaking Coordinator,* presented various permanent rules, including no wake zone rules, for notice of text and adoption. She also

presented a petition for rulemaking that would prohibit hunting deer with the use of dogs on a portion of the Columbus County Game Lands. Staff recommended noticing text for the petition and letting it proceed to public hearing. Finally, *Carrie* provided an update on our CWD rules. Next, *Christian Waters, Inland Fisheries Division Chief,* provided an update on the Roanoke River Striped Bass harvest season. Our estimates after 4 days of fishing are that anglers have harvested 5,533 pounds out of the 12,804-pound quota, and we do not expect to exceed the quota with only 2 harvest days remaining in the season. Lastly, *Commissioner Hoyle* asked *Brad Howard*, *Wildlife Management Division Chief,* to provide an update on the latest CWD positive in Wilkes County. This positive was the first roadkill positive we have found and only the second doe. *Brad* reminded commissioners that we will have a meeting in Cumberland County on May 16th.

AGENCY SPOTLIGHT

AGENCY SPOTLIGHT – LAW ENFORCEMENT – *Chad Arnold, Law Enforcement Division Lieutenant of Special Operations* gave a presentation titled "Reptile Trafficking Trends, International and Domestic." The presentation highlighted how the Law Enforcement Division has been instrumental in the conservation of and combating illegal commercialization of native non-game reptile species found within North Carolina.

RULEMAKING

Notice of Text – Various 10A Rule Readoptions – On a motion by Wes Seegars and a second by Tom Berry, the Commission approved publishing Notice of Text in the *NC Register* with an open comment period and public hearing for proposed amendments to rules 10A .0401, .0402, .1101 and .1201. presented in **EXHIBIT E** by *Carrie Ruhlman, Rulemaking Coordinator*

EXHIBIT E is incorporated into the official record of this meeting.

Permanent Rulemaking Adoption – 10D .0235 Gull Rock Game Land – On a motion by John Alexander and a second by Wes Seegars, the Commission reviewed public comments in **EXHIBIT F-1** and adopted proposed changes to Gull Rock Game Land Rule presented in **EXHIBIT F-2** by *Carrie Ruhlman*

EXHIBITS F-1, F-2 are incorporated into the official record of this meeting.

Petition for Rulemaking – On a motion by Steve Windham and a second by Jim Ruffin, the Commission approved publishing Notice of Text in the *NC Register* with an open comment period and public hearing for the petition received February 14 requesting rulemaking to prohibit the use of dogs when hunting deer on the portion of Columbus County Game Land south of NC 214 presented in **(EXHIBIT G)** by *Carrie Ruhlman*

EXHIBIT G is incorporated into the official record of this meeting.

WATER SAFETY RULEMAKING

On a motion by Mike Alford and second by David Hoyle, the Commission approved the following water safety rules presented in **EXHIBITS H-2, I-2, J-2, K-2, L-2** by *Carrie Ruhlman*:

Permanent Rulemaking Adoption – 15A NCAC 10F .0308 Clay County – The Commission reviewed public comments in **EXHIBIT H-1** and adopted proposed changes to extend the no-wake zone at the Ho Hum Campground boat ramp; remove the no-wake zone in McCracken Cove; incorporate a marked Swim Area at the Clay County Recreational Park; and incorporate a Restricted Area denoting the existing Jack Rabbit swimming area and no-wake zone presented in **EXHIBIT H-2**.

Permanent Rulemaking Adoption – 15A NCAC 10F .0316 Forsyth, Rockingham, and Stokes Counties – The Commission reviewed public comments in **EXHIBIT I-1** and adopted proposed changes to establish no-wake zones at two locations at Humphrey's Ridge Marina and Campground on Belews Lake in Stokesdale presented in **EXHIBIT I-2**.

Permanent Rulemaking Adoption – 15A NCAC 10F .0333 Lake Wylie Marine Commission, Mecklenburg County – The Commission reviewed public comments in **EXHIBIT J-1** and adopted proposed changes to establish a no-wake zone in the waters of Withers Cove on Lake Wylie presented in **EXHIBIT J-2**.

Permanent Rulemaking Adoption – 15A NCAC 10F .0355 Perquimans County – The Commission reviewed public comments in **EXHIBIT K-1** and adopted proposed changes to extend the existing no-wake zone in the Perquimans River presented in **EXHIBIT K-2**.

Permanent Rulemaking Adoption – 15A NCAC 10F .0379 City of Roxboro – The Commission reviewed public comments in **EXHIBIT L-1** and adopted proposed changes to establish a no-wake zone in Lake Roxboro presented in **EXHIBIT L-2**.

EXHIBITS H-1, H-2, I-1, I-2, J-1, J-2, K-1, K-2, L-1, L-2 are incorporated into the official record of this meeting.

Temporary Rulemaking Notice of Text – 15A NCAC 10F .0305 Town of Sunset Beach, Brunswick County – On a motion by Steve Windham and second by Kelly Davis, The Commission approved publishing Notice of Text in the *NC Register* with an open comment period and public hearing for proposed temporary Rule in the waters of South Jinks Creek for a dredging project in the creek navigation channel presented in **EXHIBIT M** by *Carrie Ruhlman*

EXHIBIT M is incorporated into the official record of this meeting.

LAND ACQUISITION AND PROPERTY MATTERS

Phase II Land Acquisition – On a motion by Tom Berry and second by Steve Windham, the Commission approved to proceed with acquisition of the following properties presented in **EXHIBITS N-1, N-2, N-3, N-4, N-5, N-6, N-7, N-8** by *Ben Solomon, Assistant Chief and Land Acquisition Manager*:

- Lakey Creek Farms Tract – Macon County **(N-1)**
- South Fork New River Access – Ashe County **(N-2)**

- Simp Gap Access Tract – Graham County **(N-3)**
- Simp Gap Main Tract – Graham County **(N-4)**
- Doll Tract – Caldwell County **(N-5)**
- Shecut Tract – Haywood County **(N-6)**
- Bay River Tract – Pamlico County **(N-7)**
- Sleepy Creek Farm Tract – Pender County **(N-8)**

EXHIBITS N-1, N-2, N-3, N-4, N-5, N-6, N-7, N-8 are incorporated into the official record of this meeting.

Other Property Matters – On a motion by Tom Berry and second by Brad Stanback, the Commission approved the following other property matters presented in **EXHIBITS O-1, O-2, O-3** by *Ben Solomon*:

- Holly Shelter Building Disposition – Request to dispose of an old office building at the Holly Shelter Depot **(O-1)**

- Ledford Chapel Disposition - Request to dispose of 0.054 acres at the Ledford Chapel Access Area **(O-2)**

- Request for Easement – NC DOT requests to purchase a Permanent Right of Way for a bridge re-routing project in Rowan County **(O-3)**

EXHIBITS O-1, O-2, O-3 are incorporated into the official record of this meeting.

WILDLIFE MANAGEMENT DIVISION

On a motion by Wes Seegars and second by Jim Ruffin, the Commission approved the following staff recommendations presented in **EXHIBITS P-3, P-4, Q** by *Brad Howard, Wildlife Management Division Chief*:

2023-2024 Webless Migratory Birds, Resident Canada Geese, Extended Falconry, and Waterfowl Seasons – The Commission reviewed U.S. Fish and Wildlife Service frameworks in **EXHIBIT P-1**, public comments in **EXHIBIT P-2**, and approved staff recommendations for the 2023-2024 season dates and bag limits for webless migratory birds, resident Canada geese, extended falconry, and waterfowl presented in **EXHIBITS P-3, P-4** by *Brad Howard*

2023 Migrant Peregrine Falconry – The Commission approved the staff recommendation to allow the take of up to five migrant peregrine falcons from the wild for use in falconry in 2023 presented in **EXHIBIT Q** by *Brad Howard*

EXHIBITS P-1, P-2, P-3, P-4, Q are incorporated into the official record of this meeting.

COMMENTS FROM THE CHAIRMAN – Chairman Crump announced with a construction contract awarded staff will begin plans for a groundbreaking ceremony for Wildlife Law Enforcement Training Facility at Samarcand.

COMMENTS FROM THE EXECUTIVE DIRECTOR – Executive Director Cameron Ingram shared that NCWRC and the N.C. Department of Transportation recently signed a Memorandum of Understanding demonstrating their commitment to work together to improve the infrastructure and safety for both wildlife and the traveling public on North Carolina roads, and he acknowledged the many partners, especially The Wildlife Federation, that assisted in this effort. Next, he shared his appreciation to staff in the western part of the state for their response efforts to the lighting storm that affected Setzer Fish Hatchery. Lastly, he expressed his appreciation to the board, staff, and partners for their commitment to wildlife conservation by supporting the agency's legislative priorities.

ADJOURNMENT

There being no further business, the WRC webinar meeting was adjourned at 9:44 a.m.
All exhibits are incorporated into the official record of this meeting by reference and are filed with the minutes.

Monty Crump, Chairman Date

Cameron Ingram, Executive Director Date

EXHIBIT B

MINUTES
June 6, 2023
N.C. Wildlife Resources Commission Webinar Meeting
Raleigh, North Carolina

Chairman Monty Crump called the June 6, 2023, N.C. Wildlife Resources Commission (NCWRC) webinar meeting to order at 9:00 a.m. in the Commission Room at the agency's headquarters in Raleigh. Crump announced that the webinar meeting audio is being streamed live and will be available on www.ncwildlife.org. He reminded Commissioners to speak their names before making motions or comments and to mute their devices when not speaking. Crump announced that by the statutory requirement, the roll will be called for attendance and for each vote.

ROLL CALL

Margo Minkler, *Commission Liaison*, called the roll. Tommy Fonville, Wes Seegars, John Coley, Landon Zimmer, David Hoyle, J.C. Cole, Steve Windham, John Stone, Tom Haislip, and Hayden Rogers were absent.

COMMISSIONER ATTENDANCE

Monty Crump	Mark Craig	Mike Alford
Tom Berry	Kelly Davis	
Jim Ruffin	Ray Clifton	
Brad Stanback	John Alexander	

MANDATORY ETHICS INQUIRY

Chairman Crump advised the Commission of the mandatory ethics inquiry as mandated in NCGS §138A-15.

RULEMAKING

Temporary Rulemaking Adoption – CWD – The Commission reviewed public comments in **EXHIBIT A-1** and, on a motion by Jim Ruffin and second by Tom Berry, the Commission adopted proposed changes to Chronic Wasting Disease (CWD) rules in **EXHIBIT A-2** presented by *Brad Howard, Wildlife Management Division Chief*

EXHIBITS A-1 & A-2 are incorporated into the official record of this meeting.

COMMENTS FROM THE CHAIRMAN

Chairman Crump shared staff are planning a groundbreaking ceremony for the Wildlife Law Enforcement Training Facility at Samarcand the week of June 19th.

ADJOURNMENT

There being no further business, the WRC webinar meeting was adjourned at 9:08 a.m.
All exhibits are incorporated into the official record of this meeting by reference and are filed with the minutes.

Monty Crump, Chairman Date

Cameron Ingram, Executive Director Date

EXHIBIT C

NORTH CAROLINA WILDLIFE RESOURCES COMMISSION
CAFR 52G - STATEMENT OF REVENUES, EXPENDITURES and CHANGES in FUND BALANCES

GOVERNMENTAL FUNDS
AS OF MAY 31, 2023

	FY 2023 General Fund	FY 2023 Capital Improvement Fund
REVENUES		
Federal funds	$ 31,923,101.02	$ 1,330,243.39
Local funds	$ 3,164.24	$ -
Investment earnings	$ 267,834.56	$ -
Sales and services	$ 12,524,714.39	$ -
Rental and lease of property	$ 57,433.70	$ -
Fees, licenses and fines	$ 31,904,443.63	$ -
Contributions, gifts and grants	$ 2,590,285.98	$ 6,235,863.65
Miscellaneous	$ 134,759.33	$ -
Unclassified/invalid accounts	$ 4,332.47	$ -
Other Financing Sources - Sale of capital assets	$ 347,080.84	$ -
Other Financing Sources - Insurance recoveries	$ 53,366.88	$ -
Other Financing Sources - Transfers in	$ 5,052,923.18	$ 2,621,170.31
Other Financing Sources - Appropriations	$ 15,504,447.00	$ -
TOTAL REVENUES	**$ 100,367,887.22**	**$ 10,187,277.35**
EXPENDITURES		
Personal services	$ 36,112,440.46	
Employee benefits	$ 17,644,534.30	
Contracted personal services	$ 10,347,394.43	$ 276,015.04
Supplies and materials	$ 8,355,683.84	$ 518.93
Travel	$ 616,090.63	
Communication	$ 1,163,749.25	
Utilities	$ 677,412.39	
Data processing services	$ 715,833.19	
Other services	$ 4,278,316.10	$ 31,856.44
Claims and benefits	$ 1,387,982.00	
Other fixed charges	$ 277,843.16	$ 50,710.00
Capital outlay	$ 7,749,228.70	$ 10,092,816.64
Grants, state aid and subsidies	$ 4,379,539.10	
Insurance and bonding	$ 252,920.48	
Other expenditures	$ 2,537,729.28	
Reimbursements	$ (1,087,782.77)	
Unclassified/invalid accounts	$ 56,373.29	
Other Financing (Uses) - Transfers out	$ 6,261,640.31	
TOTAL EXPENDITURES	**$ 101,726,928.14**	**$ 10,451,917.05**
EXCESS OF REVENUES OVER (UNDER) EXPENDITURES	$ (1,359,040.92)	$ (264,639.70)
FUND BALANCE - JULY 1, 2022	$ 19,342,386.49	$ 3,281,835.81
FUND BALANCE - MAY 31, 2023	**$ 17,983,345.57**	**$ 3,017,196.11**

NORTH CAROLINA WILDLIFE RESOURCES COMMISSION ENDOWMENT PORTFOLIO

Fund Balance*: May 2023 $159,046,113.35

* Based On Financial Institutions' Data And Does Not Include Time-Lag Entries.

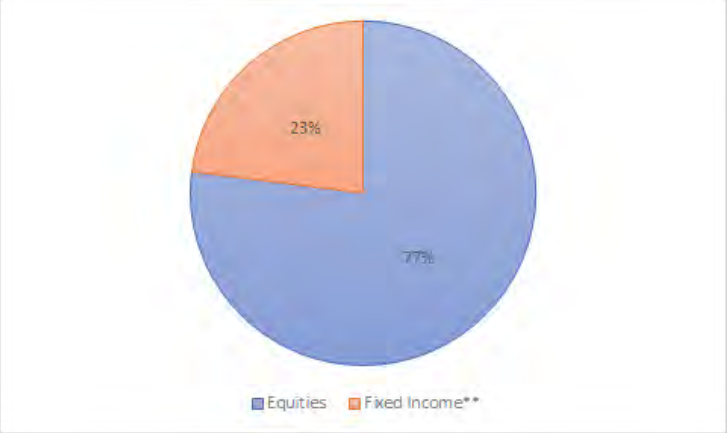
§ 143-250.1. Wildlife Endowment Fund

(d) (3). No expenditure or disbursement shall be made from the principal of the Wildlife Endowment Fund except as otherwise provided by law.

(d) (4). The income received and accruing from the investments of the Wildlife Endowment Fund must be spent only in furthering the conservation of wildlife resources and the efficient operation of the North Carolina Wildlife Resources Commission in accomplishing the purposes of the agency as set forth in G.S. 143-239.

(g) The Wildlife Endowment Fund and the investment income therefrom shall not take the place of State appropriations or Agency receipts placed in the Wildlife Resources Fund, or any part thereof, but any portion of the income of the Wildlife Endowment Fund available for the purpose set out in subdivision (4) of subsection (d) shall be used to supplement other income of and appropriations to the Wildlife Resources Commission to the end that the Commission may improve and increase its services and become more useful to a greater number of people.

ASSET ALLOCATION



	Principal	Nonexpendable	Expendable	Total
Adult	$ 78,381,157.90		$ 44,994,340.41	$ 123,375,498.31
Magazine	$ 1,573,477.50		$ 741,337.31	$ 2,314,814.81
Contributions	$ 827,893.50		$ 2,285,617.92	$ 3,113,511.42
Diversity	$ 106,751.45		$ 7,799.97	$ 114,551.42
Infant	$ 20,747,375.00	$ 6,134,472.42		$ 26,881,847.42
Youth	$ 2,938,389.00	$ 342,698.47		$ 3,281,087.47
				$ 159,081,310.85
Total	$ 104,575,044.35	$ 6,477,170.89	$ 48,029,095.61	$ 159,081,310.85
				$ -

*** Include Deposit/s In Transit

Exhibit D-1

July 13, 2023

North Carolina Wildlife Resources Commission
Land Acquisition Investigation Form

Phase II: FINAL ACQUISITION DETAILS

Tract Name: *Kelly Cove*

WRC Action/Approval to Pursue (Date): 4/19/2023

Acquisition Plan (specify total project costs AND sources of funding):

Acquisition with Mainspring Conservation Trust

NCLWF	*$ 215,491*
Bargain Sale	*$ 400,568*
TOTAL COST	***$ 616,059***

Acquisition Plan Includes Bargain Sale? ☒Yes ☐No ☐N/A
If Yes, Explain Details:

Total Cost Based on Appraisal? ☒Yes ☐No ☐N/A

If Yes, Describe in Table:

Requested By	Appraiser	Effective Date	Appraised Value
Mainspring Conservation Trust	*Guy Duvall*	*11/19/2021*	*$6,083/acre*

Appraisal Handled by State Property Office? ☐Yes ☒No ☐N/A

Source(s) of Stewardship Funds (indicate federal:state match rates):
Federal Assistance Grant – 75% federal: 25% state

Five-Year Stewardship Costs & Revenue Projections (worksheet attached):

Total Stewardship Expenditures	*$ 35,800*
Total Projected Revenue	*$ 0*

Exhibit D-1

July 13, 2023

North Carolina Wildlife Resources Commission
Land Acquisition Investigation Form

Phase II: COSTS AND REVENUE WORKSHEET

Estimated Five Year Stewardship Costs and Revenue Projections:

Estimated Stewardship Costs				
Activity	**Quantity**	**Unit**	**Unit Cost**	**Total Cost**
Boundary Establishment	*17,200*	*Feet*	*$1.50*	*$25,800*
Gravel Parking	*1*	*Each*	*$10,000*	*$10,000*
TOTAL				***$35,800***

Estimated Revenue Projections				
Source	**Quantity**	**Unit**	**Unit Revenue**	**Total Revenue**
				$0
TOTAL				***$ 0***

April 19, 2023

North Carolina Wildlife Resources Commission
Land Acquisition Investigation Form
– PHASE I: INITIAL INVESTIGATION –

WRC Staff Contact:	David Stewart
Date First Presented to Commission:	April 19, 2023
Tract Name:	Kelly Cove Tract - Needmore Game Land
County:	Macon
Acreage:	95 acres
Tax Value:	
Property Owner/Representative:	Mainspring Conservation Trust Emmie Cornell
Phone:	
Email Address:	
Address:	

	Primary Purpose:
x	Resource Protection
x	Resource Management
x	User Access
	WRC Facility

	Program Potential:
x	Game Land
	Wildlife Conservation Area
	Access Area
	None

	Type of Acquisition:
x	Purchase
	Lease
	Easement

	Type of Parcel:
x	Tract
	Riparian Corridor

	Grant Potential:
	CWMTF
x	Federal Aid (PR, WB, etc.)
	Endowment
	Donation

	Owner Interest:
x	High
	Moderate
	Low
	No

	Tax Value:
	Year Assessed
	PUV?

	Stewardship Considerations:
PR	Source:
State	Match:

	Funding Considerations:
	Donation
	Bargain Sale
	Partner Contribution

	Recommendation:
x	Pursue
	Do Not Pursue
	Defer

Additional Comments:

Mainspring Conservation Trust was able to purchase this tract at a bargain price from a conservation-minded seller and now wishes to sell the tract to NCWRC. The tract is currently enrolled in the NCWRC Game Land Program. The tract will serve as an important wildlife corridor between the US Forest Service protected lands in the Nantahala Mountains to the west and the Needmore Game Land to the east in Macon County. Protection of this tract will also conserve the entirety of Goldmine Creek, a pristine spring-fed tributary to Burningtown Creek, an “exceptional” Natural Heritage Program aquatic habitat area, and provide excellent public access to a adjacent Needmore Game Lands tract which was previously inaccessible to the public.

April 19, 2023

North Carolina Wildlife Resources Commission
Land Acquisition Investigation Form
– PHASE I: INITIAL INVESTIGATION –

	Kelly Cove Tract Needmore Game Land
County:	Macon County

Resources Assessment and Biological Benefits (brief):

The Kelly Cove Tract is a 95 acre tract that is mostly wooded with some open areas as well as bottomland areas. The property is located in Macon County, 8 miles Northwest of Franklin and lies between USFS property and the Needmore Game Land, Lower Burningtown Tract. The bottomland areas consists of early-successional habitat and Montaine Alluvial Forest. The upland is forested (mostly Mountain Oak-Hickory and Acidic Cove Forests), with small early-successional areas along old logging roads. There are also small biologically significant wetland areas on the tract. The property has timber potential, in particular, the oaks in the Montaine Hickory Forest could be desirable for timber and the relatively gently slopes and good access roads would facilitate logging. The tract has 1191 feet of frontage of Burningtown Creek and at least 3000 feet of perennial tributaries to Burningtown Creek (including the entirety of Goldmine Creek) as well as numerous intermittent streams. Burningtown Creek is rated Class B by the NC Department of Environmental Quality, with supplemental Trout Waters designation. Class B waters are protected for primary contact recreation and propagation, survival and maintenance of aquatic life. Burningtown Creek is also part of the Little Tennessee River (Lower) Aquatic Habitat. The NC Natural Heritage Program gives it the highest possible rating, R1/C1 (Exceptional). This aquatic habitat is critical for many aquatic species. These include the Appalachian elktoe (Alasmidonta raveneliana), slippershell mussel (Alasmidonta viridis), and Tennessee clubshell (Pleurobema oviforme), all Endangered in North Carolina; the sicklefin redhorse (Moxostoma sp. 2), spotfin chub (Erimonax monachus), and rainbow (Villosa iris), all Threatened in North Carolina; the highland shiner (Notropis micropteryx), Significantly Rare in North Carolina; and the wavyrayed lampmussel (Lampsilis fasciola), wounded darter (Etheostoma vulneratum), banded sculpin (Cottus carolinae), and spike (Elliptio dilatata), all species of Special Concern in North Carolina. The Little Tennessee River valley is one of the most archaeologically significant regions in North Carolina. The archaeological sites recorded in the valley represent settlements from all periods of Native American history, from 8000 BC onward, including several of the major Cherokee towns of the 16th to 18th centuries. Although there are no documented archaeological sites on or near the Property, the bottomland was part of the Burningtown settlements, and it is likely that the rest of the Property was used at least occasionally by Cherokee and other Native American groups. It is likely that archaeological resources are preserved underground.

Acquisition of this property is significant as part of the total management project being carried out in the mountain Eco region. NCWRC ownership of the Kelly Cove Tract will increase conservation ownership of properties in the immediate area such as the Needmore Game Land, Nantahala National Forest, Mainspring Conservation Trust Lands, and various private holdings that are in conservation ownership or have conservation easements that are located in the vicinity. In a broader sense, NCWRC ownership of the tract will help ensure ecosystem integrity at the landscape level by increasing connectivity of lands in conservation ownership. Management objectives will focus on expanding on the management that is currently being implemented on Needmore Game Lands. NCWRC ownership would ensure that critical habitat is conserved. Public recreational opportunities may include hunting, fishing, boating, hiking, bird watching, photography, and general nature study. Educational opportunities may exist as priority wildlife habitats are managed for or maintained. Common wildlife species found on the tract include wild turkey, white-tailed deer, gray squirrel, as well as various songbirds, salamanders, and small mammals. The Kelly Cove Tract will make a great addition to Needmore Game Land.

Tract Name	**Kelly Cove Tract - Needmore Game Land**
Date	**April 19, 2023**
Staff Completing Form	**David Stewart**

Species	**0.889**
	Terrestrial
Overall Biodiversity	3
SGCN Species	3
Game Species	3
	Wetland
Overall Biodiversity	2
SGCN Species	2
Game Species	2
	Aquatic
Overall Biodiversity	3
SGCN Species	3
Game Species	3

Comments

Overall Biodiversity is good. The tract contains significant natural heritage element occurences.

Habitat	**0.833**
Size	0
Quality	3
Diversity	3
Rare/Important	3
Connectivity	3
Buffer	3

Comments

The quality of the habitat on the tract is good, as is diversity. The properties provide good connectivity and buffer to USFS, Needmore Game Land and Burningtown Creek and tributaries.

Public Access	**1.000**
Hunting/Viewing	3
Fishing	3
Boating	3

Comments

The property provide excellent legal access to Needmore Game Land and USFS. The lower Burningtown Creek Tract of Needmore GL does not have legal public access without the Kelly Cove Tract.

Wildlife Uses	**1.000**
Hunting	3
Viewing	3
Fishing	3
Boating	3
Education	3

Comments

The property offers excellent hunting, fishing, boating, and hiking opportunity, as well as opportunity for wildlife viewing. Educational opportunities also exist.

Other Values	**0.889**
Timber Harvest	2
Local Economy	3
Quality of Life	3

Comments

Timber harvest opportunities are possible. The tracts recreational opportunities could help benefit local economies and the conservation of the tract could help the quality of life for visitors as well as locals.

Feasibility & Logistics	**0.867**
Existing Infrastructure	1
Compatibility of Multiple Uses on Tract	3
Compatibility with Adjoining Land	3
Inholding/Corridor	3
Proximity to Users	3

Comments

Conflicts among game land users and adjoiners should be minimal. The activities that takes place of the tract will be compatible with the existing USFS land as well as the existing Needmore Game Land. This tract provides an excellent corridor between Needmore Game Land and the Nantahala Game Land. The tract is in good proximity to users.

Restoration/Mitigation Potential	**1.000**
Species Restoration	3
Habitat Restoration	3
Access Improvement	3
Threat Mitigation	3

Comments

Restoration and habitat management potential on the tract is good. Access improvement achieved through Kelly Cove providing public access to part of the existing game land. Threat mitigation is very good, the threat of development of the tract is great.

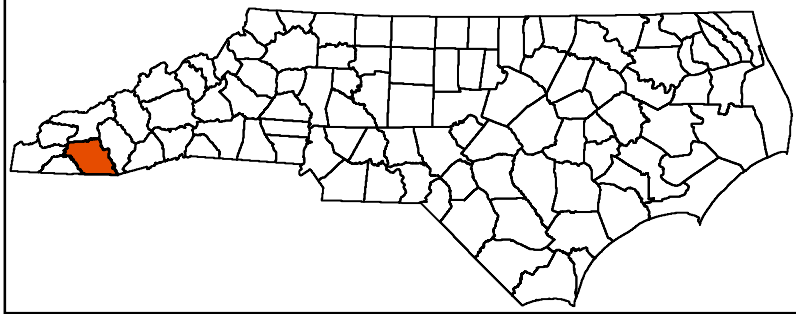
Threats	**0.600**
Number	3
Severity	3
Imminence	3
Manageability	0
Management Cost	0

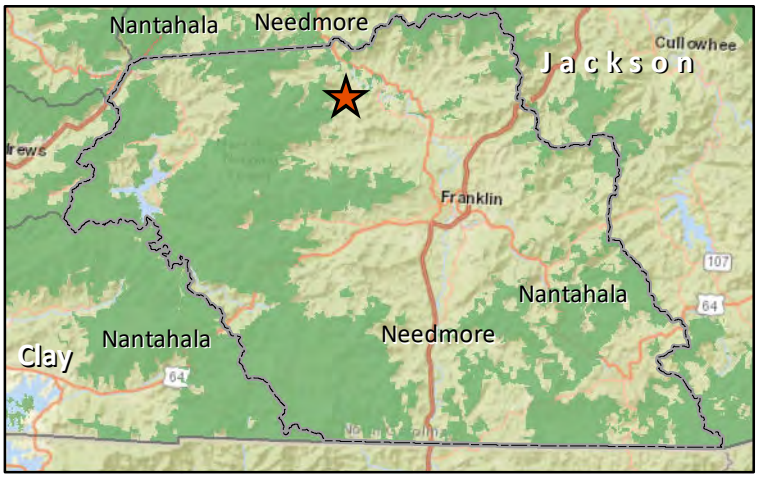
Comments

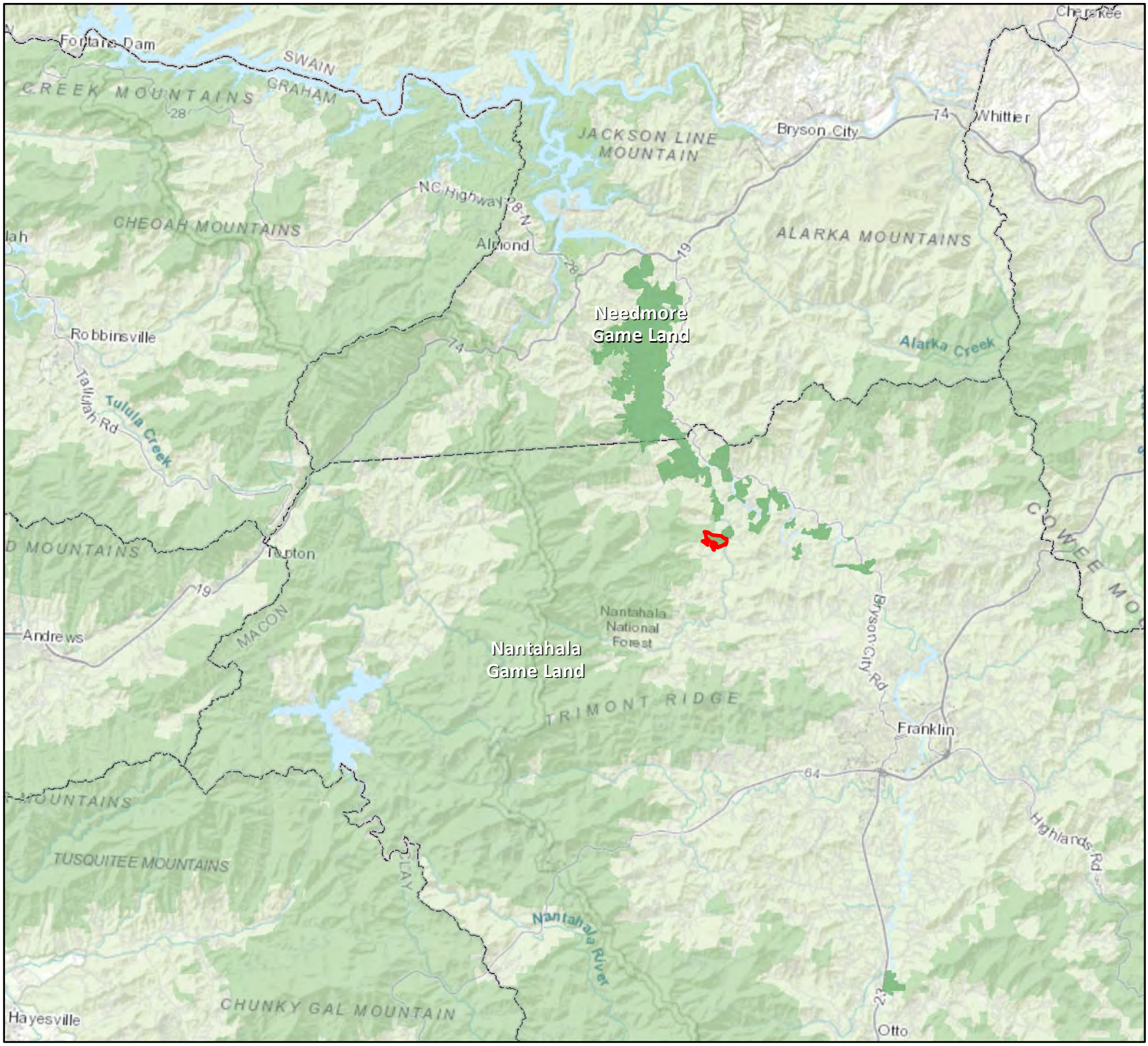
The biggist threat in this area is loss of habitat due to residential development. Acquitition of the property would stop that threat on this tract.

Overall Score	**5.878**

Kelly Cove Tract
Macon County
95 Acres







Kelly Cove Tract

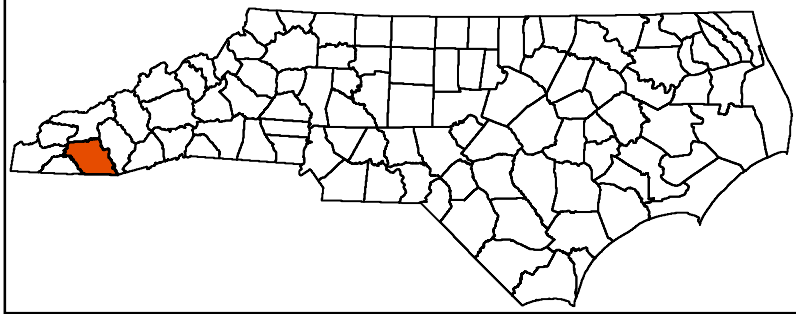
Needmore Game Land

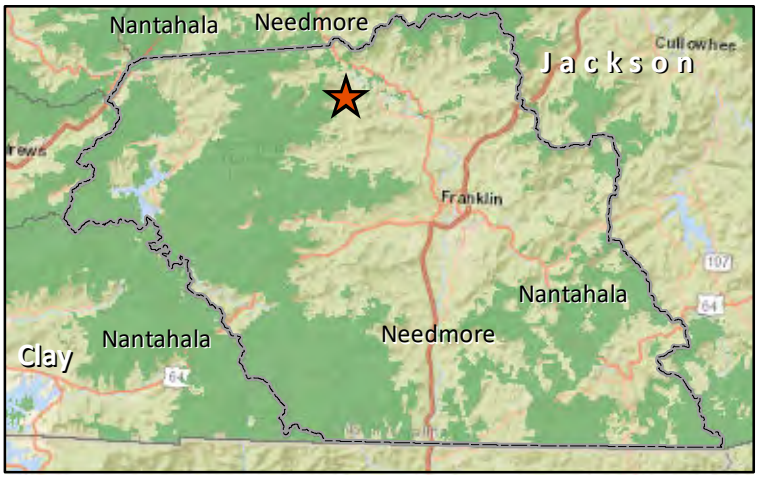
Other Game Lands

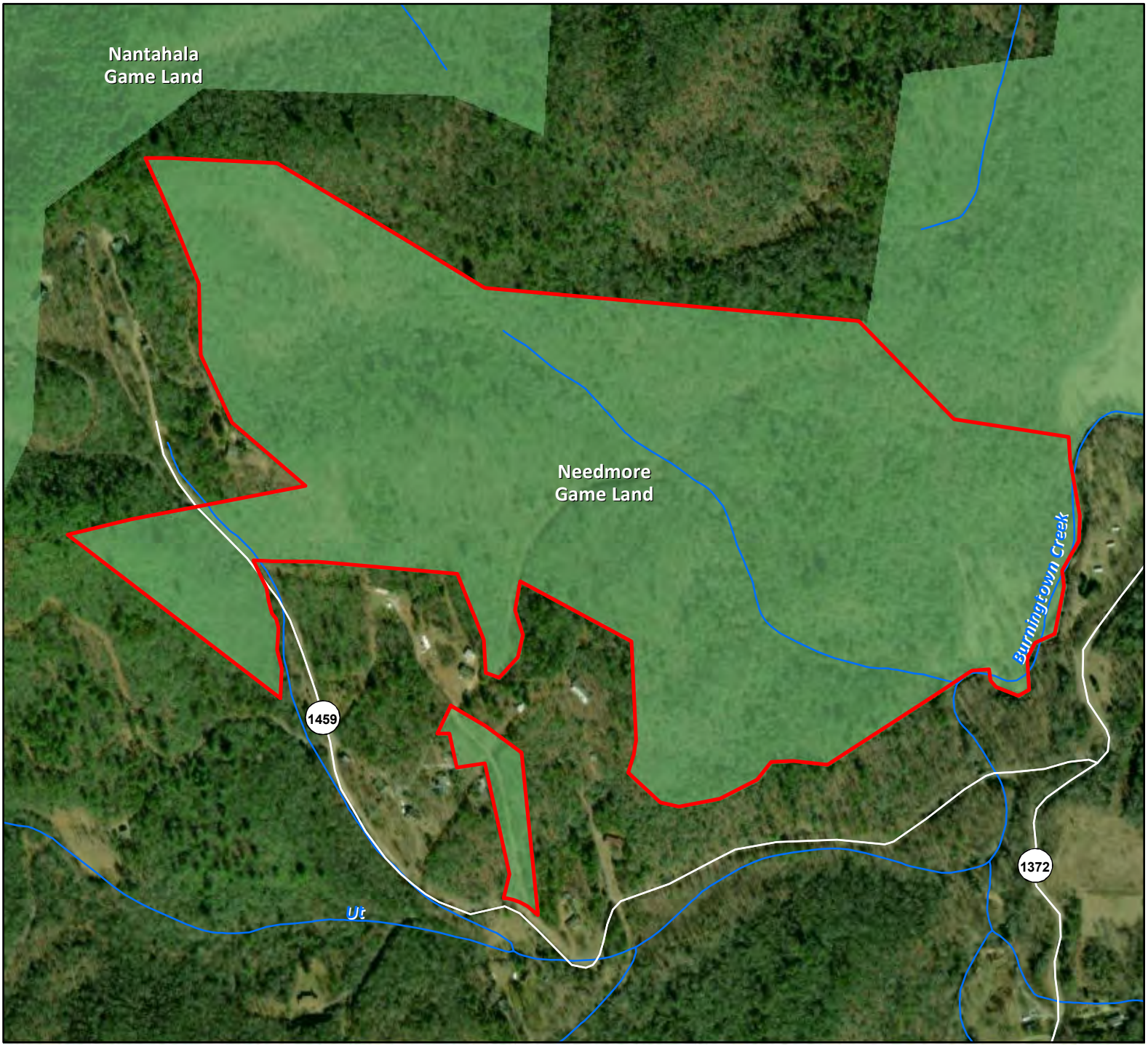
0 2 4
Miles

N
W E
S

Kelly Cove Tract
Macon County
95 Acres







Kelly Cove Tract

Game Land

0 0.05 0.1
Miles

N
W E
S

Exhibit D-2

July 13, 2023

North Carolina Wildlife Resources Commission
Land Acquisition Investigation Form

Phase II: FINAL ACQUISITION DETAILS

Tract Name: *Griffin*

WRC Action/Approval to Pursue (Date): 12/08/22

Acquisition Plan (specify total project costs AND sources of funding):

Pittman Robertson	*$ 56,000*
TOTAL COST	***$ 56,000***

Acquisition Plan Includes Bargain Sale? ☐Yes ☒No ☐N/A
If Yes, Explain Details:

Total Cost Based on Appraisal? ☒Yes ☐No ☐N/A

If Yes, Describe in Table:

Requested By	Appraiser	Effective Date	Appraised Value
NC State Property Office	*Michael J. Moore*	*02/24/2023*	*$8,000/acre*

Appraisal Handled by State Property Office? ☒Yes ☐No ☐N/A

Source(s) of Stewardship Funds (indicate federal:state match rates):
Federal Assistance Grant – 75% federal: 25% state

Five-Year Stewardship Costs & Revenue Projections (worksheet attached):

Total Stewardship Expenditures	*$ 200*
Total Projected Revenue	*$ 0*

Exhibit D-2

July 13, 2023

North Carolina Wildlife Resources Commission
Land Acquisition Investigation Form

Phase II: COSTS AND REVENUE WORKSHEET

Estimated Five Year Stewardship Costs and Revenue Projections:

Estimated Stewardship Costs				
Activity	**Quantity**	**Unit**	**Unit Cost**	**Total Cost**
Boundary Establishment	*0.5*	*Miles*	*$400*	*$200*
TOTAL				***$200***

Estimated Revenue Projections				
Source	**Quantity**	**Unit**	**Unit Revenue**	**Total Revenue**
				$0
TOTAL				***$ 0***

December 7, 2022

North Carolina Wildlife Resources Commission
Land Acquisition Investigation Form
– PHASE I: INITIAL INVESTIGATION –

WRC Staff Contact:	David Stewart
Date First Presented to Commission:	December 7, 2022
Tract Name:	Griffin Branch Tract/Sandy Mush Game Land
County:	Buncombe
Acreage:	7 +or-
Tax Value:	Asking price: appraised value
Property Owner/Representative:	Gary Griffin
Phone:	
Email Address:	
Address:	

	Primary Purpose:
x	Resource Protection
x	Resource Management
x	User Access
	WRC Facility

	Program Potential:
x	Game Land
	Wildlife Conservation Area
	Access Area
	None

	Type of Acquisition:
x	Purchase
	Lease
	Easement

	Type of Parcel:
x	Tract
	Riparian Corridor

	Grant Potential:
x	CWMTF
x	Federal Aid (PR, WB, etc.)
	Endowment
	Donation

	Owner Interest:
x	High
	Moderate
	Low
	No

	Tax Value:
	Year Assessed
	PUV?

	Stewardship Considerations:
	Source:
	Match:

	Funding Considerations:
	Donation
	Bargin Sale
	Partner Contribution

	Recommendation:
x	Pursue
	Do Not Pursue
	Defer

Additional Comments:

Mr. Gary Griffin owns a 23 acre parcel that borders Sandy Mush Game Land in Buncombe County. He wishes to survey off approximately 7 acres that borders the game land and sell to WRC.

December 7, 2022

North Carolina Wildlife Resources Commission
Land Acquisition Investigation Form
– PHASE I: INITIAL INVESTIGATION –

	Griffin Branch Tract
County:	Buncombe County

Resources Assessment and Biological Benefits (brief):

The Griffin Branch Tract contains approximately 7 acres and is located in Buncombe County adjacent to Sandy Mush Game Land. The property is accessed from Griffin Branch Road . Acquisition of this property is significant as part of the total management project being carried out in the mountain Eco region. NCWRC ownership of the Griffin Branch Tract will increase conservation ownership of properties in the immediate area such as the Sandy Mush Game Land, Pisgah National Forest, Southern Appalachian Highlands Conservancy Lands, and various private holdings that are in conservation ownership or have conservation easements that are located in the vicinity. In a broader sense, NCWRC ownership of the tract will help ensure ecosystem integrity at the landscape level by increasing connectivity of lands in conservation ownership. Management objectives will focus on expanding on the management that is currently being implemented on Sandy Mush Game Land by providing an additional land buffer between the adjacent developed private land and the existing Sandy Mush property. Commercial development is a major issue in the Sandy Mush area. Along with the development comes the threats of having to establish new safety zones on the game land as well as threats to management activities like prescribed fire. NCWRC ownership would ensure that critical habitats are conserved. Public recreational opportunities on the current game land may include hunting, hiking, bird watching, photography, and general nature study. The acquisition of the Griffin Branch Tract will help ensure that these activities will continue. Common wildlife species found on the tract include wild turkey, white-tailed deer, rabbit and quail, as well as various songbirds, salamanders, and small mammals.

Tract Name	**Griffin Branch Tract - Sandy Mush Game Land**
Date	**October 27, 2022**
Staff Completing Form	**David Stewart**

Species	**0.185**
	Terrestrial
Overall Biodiversity	2
SGCN Species	1
Game Species	2
	Wetland
Overall Biodiversity	0
SGCN Species	0
Game Species	0
	Aquatic
Overall Biodiversity	0
SGCN Species	0
Game Species	0

Comments

Moderate biodiversity is based on a diversity of cover types and age classes, and the diversity of wildlife found on the property.

Habitat	**0.444**
Size	0
Quality	2
Diversity	1
Rare/Important	1
Connectivity	2
Buffer	2

Comments

The quality of the habitat on the tract is good, as is diversity. The property provides a great buffer to Sandy Mush GL.

Public Access	**0.111**
Hunting/Viewing	1
Fishing	0
Boating	0

Comments

Wildlife Uses	**0.200**
Hunting	1
Viewing	1
Fishing	0
Boating	0
Education	1

Comments

The importance of this tract is the added buffer that will ensure hunting and other wildlife related activities can continue to occure. As new homes are built near the game land, additional safety zones continue to expand into the game land preventing the public from hunting certain areas.

Other Values	**0.556**
Timber Harvest	1
Local Economy	2
Quality of Life	2

Comments

This tract will provide some benefit to the local economy and provide a better quality of life benefits to local residents.

Feasibility & Logistics	**0.733**
Existing Infrastructure	0
Compatibility of Multiple Uses on Tract	3
Compatibility with Adjoining Land	3
Inholding/Corridor	2
Proximity to Users	3

Comments

Restoration/Mitigation Potential	**0.500**
Species Restoration	1
Habitat Restoration	1
Access Improvement	1
Threat Mitigation	3

Comments

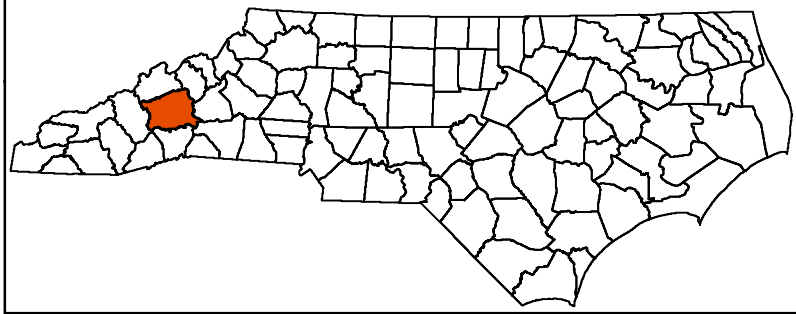
Threats	**0.533**
Number	2
Severity	3
Imminence	3
Manageability	0
Management Cost	0

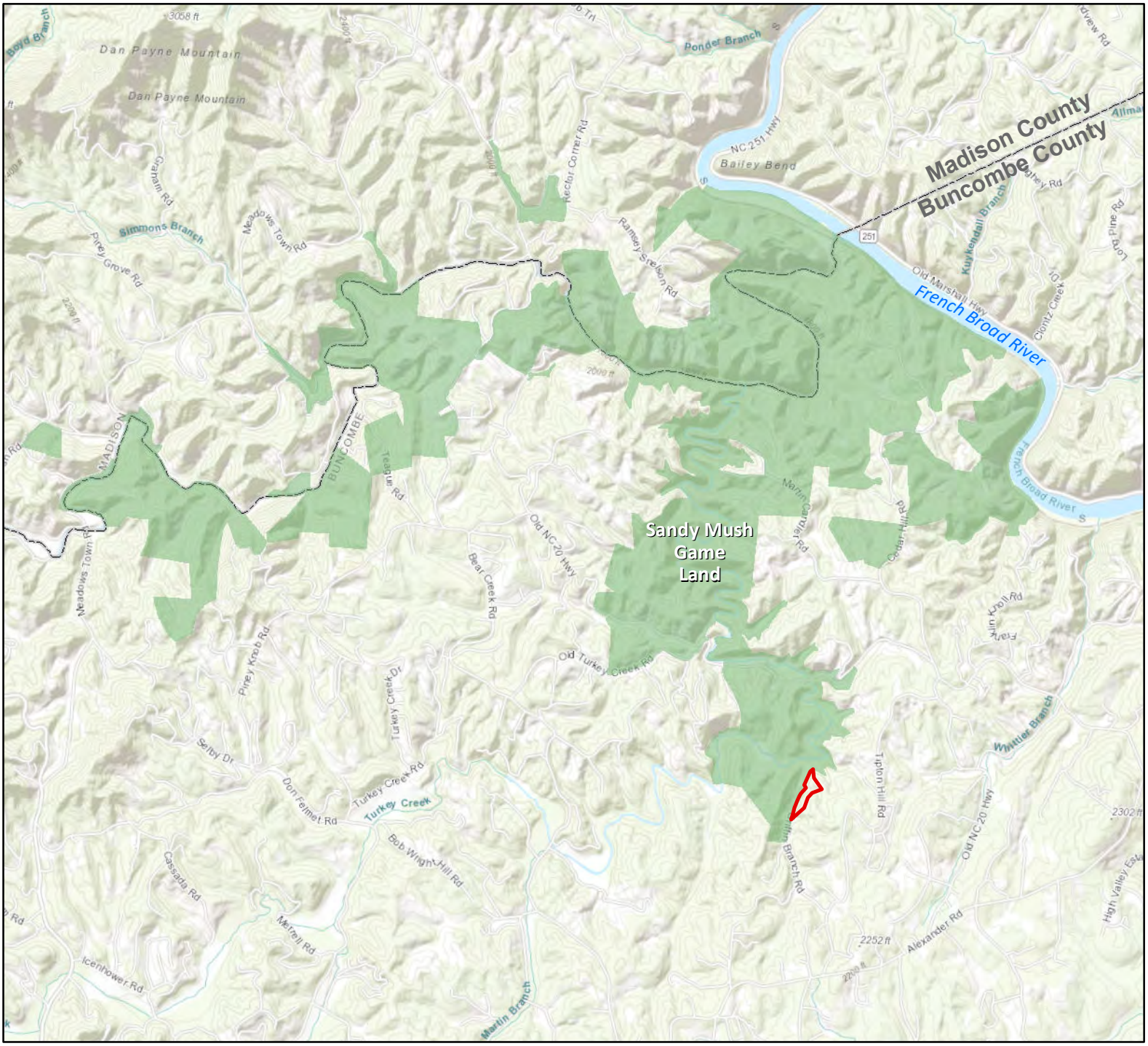
Comments

The biggist threat in this area is loss of habitat due to residential development. Along with the development comes additional safety zones. Acquitition of the property would help stop these threats on this tract and the existing game land.

Overall Score	**2.196**

Griffin Tract
Buncombe County
7 Acres





Griffin Tract

Game Land

0 0.5 1

Miles

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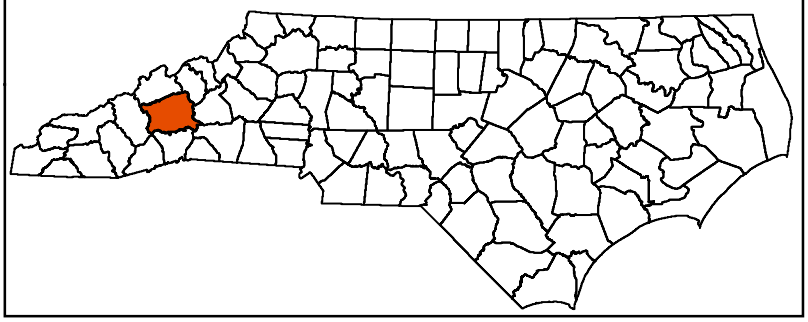
W E

S

December 7, 2022

Griffin Tract
Buncombe County
7 Acres



Griffin Tract

Game Land

0 0.05 0.1
Miles

N
W E
S

December 7, 2022

Exhibit D-3

July 13, 2023

North Carolina Wildlife Resources Commission
Land Acquisition Investigation Form

Phase II: FINAL ACQUISITION DETAILS

Tract Name: *Richardson*

WRC Action/Approval to Pursue (Date): 12/08/22

Acquisition Plan (specify total project costs AND sources of funding):

State Funds	*$ 22,575*
TOTAL COST	***$ 22,575***

Acquisition Plan Includes Bargain Sale? ☐Yes ☒No ☐N/A
If Yes, Explain Details:

Total Cost Based on Appraisal? ☒Yes ☐No ☐N/A

If Yes, Describe in Table:

Requested By	Appraiser	Effective Date	Appraised Value
NC State Property Office	*Larry Phillips*	*03/16/23*	*$22,575*

Appraisal Handled by State Property Office? ☒Yes ☐No ☐N/A

Source(s) of Stewardship Funds (indicate federal:state match rates):
Federal Assistance Grant – 75% federal: 25% state

Five-Year Stewardship Costs & Revenue Projections (worksheet attached):

Total Stewardship Expenditures	*$ 1,500*
Total Projected Revenue	*$ 0*

Exhibit D-3

July 13, 2023

North Carolina Wildlife Resources Commission
Land Acquisition Investigation Form

Phase II: COSTS AND REVENUE WORKSHEET

Estimated Five Year Stewardship Costs and Revenue Projections:

Estimated Stewardship Costs				
Activity	**Quantity**	**Unit**	**Unit Cost**	**Total Cost**
Boundary Establishment	*3.75*	*Miles*	*$400*	*$1,500*
TOTAL				***$1,500***

Estimated Revenue Projections				
Source	**Quantity**	**Unit**	**Unit Revenue**	**Total Revenue**
				$0
TOTAL				***$ 0***

December 7, 2022
North Carolina Wildlife Resources Commission
Land Acquisition Investigation Form
– PHASE I: INITIAL INVESTIGATION –

WRC Staff Contact:	Paul Thompson
Date First Presented to Commission:	December 7, 2022
Tract Name:	Richardson Tract
County:	Ashe
Acreage:	2.5 acres
Tax Value:	$19,400
Property Owner/Representative:	Darlene Richardson
Phone:	
Email Address:	
Address:	

Primary Purpose:

X	Resource Protection
	Resource Management
	User Access
	WRC Facility

Program Potential:

X	Game Land
	Wildlife Conservation Area
	Access Area
	None

Type of Acquisition:

X	Purchase
	Lease
	Easement

Type of Parcel:

X	Tract
	Riparian Corridor

Grant Potential:

	CWMTF
X	Federal Aid (PR, WB, etc.)
	Endowment
X	Other

Owner Interest:

X	High
	Moderate
	Low
	No

Tax Value:

	Year Assessed
	PUV?

Stewardship Considerations:

Fed	Source: Federal Aid: 75%
State	Match: State: 25%

Funding Considerations:

	Donation
	Bargain Sale
	Partner Contribution

Reviewed Appraisal & Purchase Requirements?

X	Yes
	No
	N/A

Recommendation:

X	Pursue
	Do Not Pursue
	Defer

Additional Comments:

This 2.5 acre tract will help solidify state ownership and alleviate future issues with right-of-way requests. There could be potential in the future for the state to acquire adjoining parcels in this area. If this 2.5 acre tract is not pursued, it could result in an inholding situation and ROW issues in the future.

December 7, 2022

North Carolina Wildlife Resources Commission
Land Acquisition Investigation Form
– PHASE I: INITIAL INVESTIGATION –

Tract Name:	Richardson Tract
County:	Ashe

Resources Assessment and Biological Benefits (brief):

The 2.5 acre tract will provide additional resource protection to Three Top Mountain. The tract is comprised mostly of southern appalachian oak forest type. This tract is part of the Three Top Mountain Natural Area with several significant natural communties noted by Natural Heritage. SGCN have not been documented on the tract, but those likely found on tract as transients include box turtle, timber rattlesnake, wood thrush, and worm-eating warbler. Common game species found on the tract include white-tailed deer, wild turkey, and gray squirrel. Management objectives will include protecting water quality, maintaining/restoring priority wildlife habitats, and continuing to provide increased opportunity for hunting and other outdoor recreational activities.

Tract Name	**Richardson Tract**
Date	**October 3, 2022**
Staff Completing Form	**Paul Thompson**

Species	**0.111**
	Terrestrial
Overall Biodiversity	1
SGCN Species	1
Game Species	1
	Wetland
Overall Biodiversity	0
SGCN Species	0
Game Species	0
	Aquatic
Overall Biodiversity	0
SGCN Species	0
Game Species	0

Comments

Although SGCN's may be located on the tract, the score is low due to small size of the tract. The same could be said for overall biodiversity and game species. There is an absence of wetlands and streams.

Habitat	**0.500**
Size	0
Quality	2
Diversity	1
Rare/Important	1
Connectivity	2
Buffer	3

Comments

The quality of the habitat on the tract is good, but it's mostly closed canopy Appalachian oak forest with little diversity. The property is included in NHP Three Top Mountain Natural Area designation. The property does provide good connectivity and buffer for these natural communities that are also found on Three Top Mountain GL.

Public Access	**0.222**
Hunting/Viewing	2
Fishing	0
Boating	0

Comments

The tract lacks any streams or water, but may provide easier access to the game land in the future.

Wildlife Uses	**0.267**
Hunting	2
Viewing	2
Fishing	0
Boating	0
Education	0

Comments

The property offers good hunting and wildlife viewing opportunities. Educational opportunities will be low. No significant water is located on the tract, so there is no fishing/boating opportunity.

Other Values	**0.333**
Timber Harvest	1
Local Economy	1
Quality of Life	1

Comments

The tract can produce good timber, but the value can only be considered low due to it's size.

Feasibility & Logistics	**0.600**
Existing Infrastructure	0
Compatibility of Multiple Uses on Tract	1
Compatibility with Adjoining Land	3
Inholding/Corridor	3
Proximity to Users	2

Comments

No infrastructure exists on this tract. The existance of multiple uses on the tract and the compatibility with adjoining land shouldn't create any issues. This tract will fill a gap in WRC ownership and become part of a large corridor at Three Top Mountain.

Restoration/Mitigation Potential	**0.417**
Species Restoration	1
Habitat Restoration	1
Access Improvement	1
Threat Mitigation	2

Comments

Restoration and maintenance of the habitats/species on the tract is good, thus the rank is moderate. This tract will ensure continued public access across the Three Top Mtn GL, thus the rank is high.

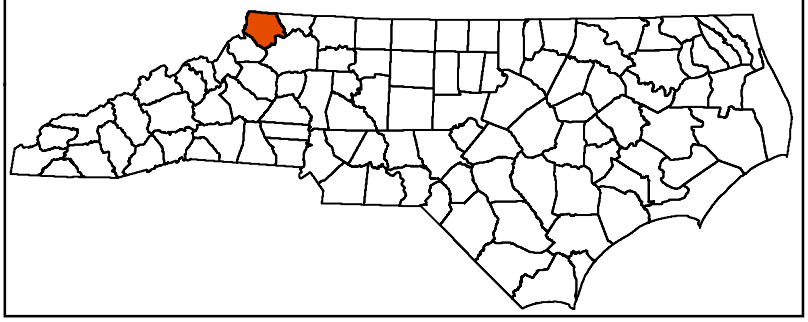
Threats	**0.133**
Number	1
Severity	0
Imminence	1
Manageability	0
Management Cost	0

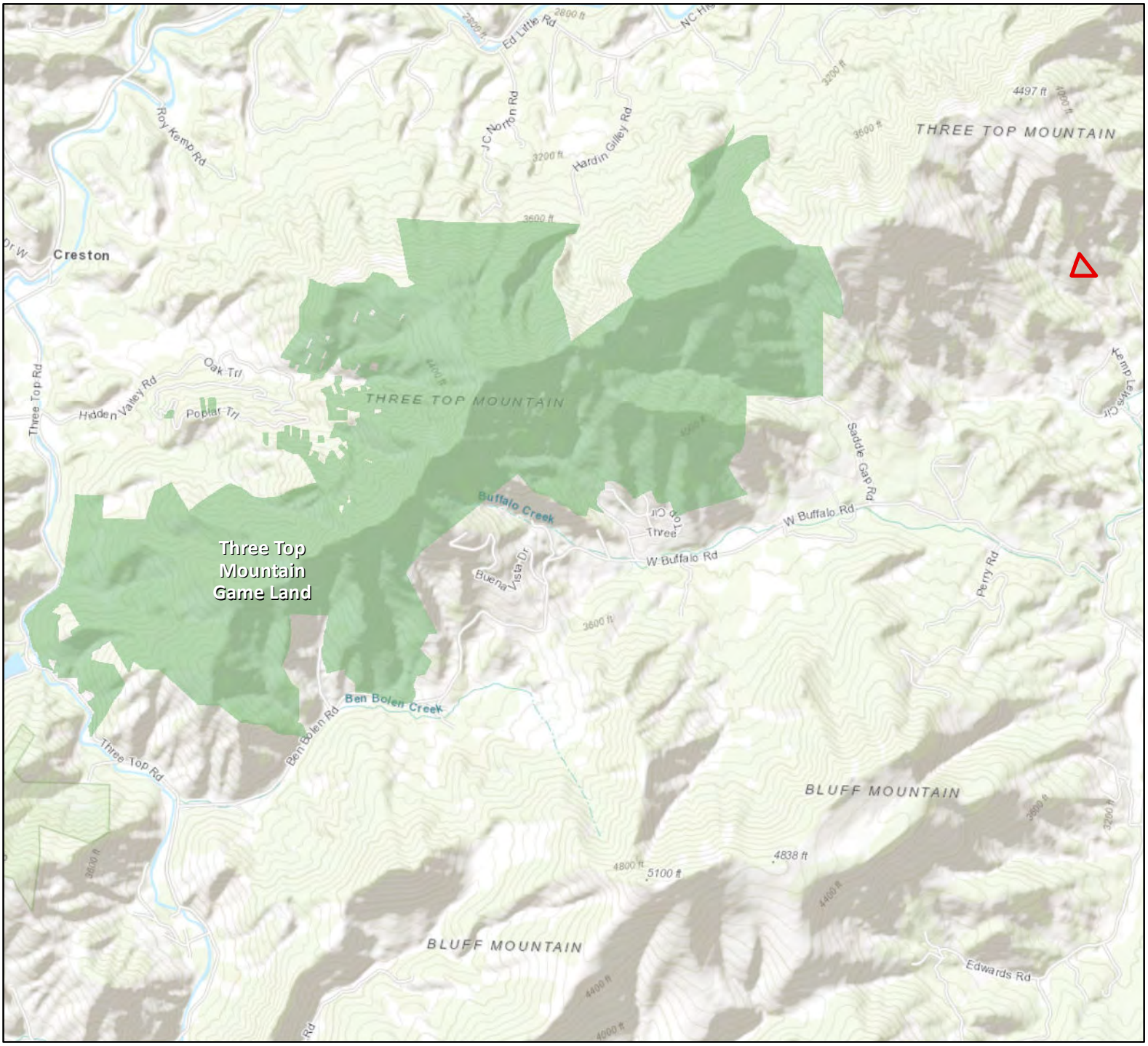
Comments

The landowner would like to sell this tract to WRC, but does have some concern with the lengthy process.

Overall Score	**2.317**

Richardson Tract
Ashe County
2.5 Acres





Richardson Tract

Game Land

0 0.5 1

Miles

N

W E

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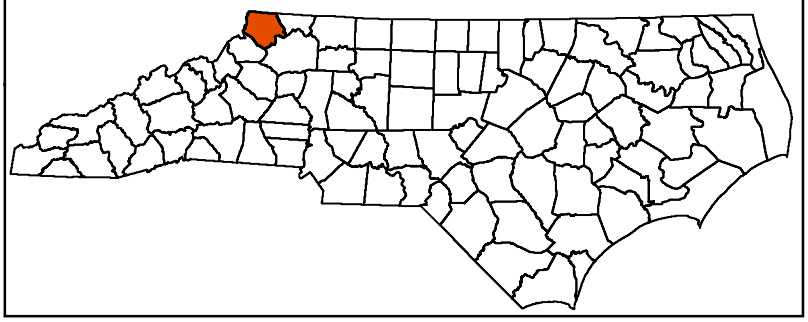
Richardson Tract
Ashe County
2.5 Acres



Richardson Tract

Game Land

0 0.125 0.25

Miles

N

W E

S

Exhibit D-4

July 13, 2023

North Carolina Wildlife Resources Commission
Land Acquisition Investigation Form

Phase II: FINAL ACQUISITION DETAILS

Tract Name: *Spencer Bay*

WRC Action/Approval to Pursue (Date): 4/19/2023

Acquisition Plan (specify total project costs AND sources of funding):

Acquisition through NC Coastal Land Trust

NAWCA	*$ 1,483,000*
NCLWF	*$ 1,900,000*
Pittman Robertson	*$ 660,000*
Private	*$ 250,000*
TOTAL COST	***$ 4,293,000***

Acquisition Plan Includes Bargain Sale? ☐Yes ☒No ☐N/A
If Yes, Explain Details:

Total Cost Based on Appraisal? ☒Yes ☐No ☐N/A

If Yes, Describe in Table:

Requested By	Appraiser	Effective Date	Appraised Value
ESTATE OF CONRAD ALLEN CURRIN	*R. EARL JONES, MAI, SRA REALTY SERVICES OF EASTERN CAROLINA, INC.*	*4-16-2020*	*$4,293,000*
NC Coastal Land Trust	*Quentin Bell*	*requested*	

Appraisal Handled by State Property Office? ☐Yes ☒No ☐N/A

Source(s) of Stewardship Funds (indicate federal:state match rates):
Federal Assistance Grant – 75% federal: 25% state

Five-Year Stewardship Costs & Revenue Projections (worksheet attached):

Total Stewardship Expenditures	*$ 243,175*
Total Projected Revenue	*$ 10,000*

Exhibit D-4

July 13, 2023

North Carolina Wildlife Resources Commission
Land Acquisition Investigation Form

Phase II: COSTS AND REVENUE WORKSHEET

Estimated Five Year Stewardship Costs and Revenue Projections:

Estimated Stewardship Costs				
Activity	**Quantity**	**Unit**	**Unit Cost**	**Total Cost**
Boundary Establishment	*47*	*Mile*	*$150*	*$7,050*
Boundary Maintenance (Year 4)	*47*	*Mile*	*$135*	*$6,345*
Impoundment Management	*5*	*Per year*	*$3,000*	*$15,000*
Waterfowl Hunt Blinds	*2*	*Each*	*$2,500*	*$5,000*
Waterfowl Blind Maintenance/Brushing	*2*	*Per Year*	*$450*	*$4,500*
Impoundment Posting	*2.5*	*Mile*	*$512*	*$1,280*
Dike Maintenance	*2.5*	*Mile*	*$2,500*	*$31,250*
Pump Conversion from Diesel to Electric	*1*	*Each*	*$150,000*	*$150,000*
Road/Trail Maintenance	*1.4*	*Mile*	*$2,500*	*$17,500*
Building Maintenance Water/Electric				*Cost not determined*
Grounds Maintenance	*1*	*Per Year*	*$1,050*	*$5,250*
TOTAL				***$243,175***

Estimated Revenue Projections				
Source	**Quantity**	**Unit**	**Unit Revenue**	**Total Revenue**
Permit Hunt Applications	*250*	*Per Year*	*$8*	*$10,000*
TOTAL				***$ 0***

April 19, 2023
North Carolina Wildlife Resources Commission
Land Acquisition Investigation Form
– PHASE I: INITIAL INVESTIGATION –

WRC Staff Contact:	David Turner
Date First Presented to Commission:	April 19, 2023
Tract Name:	Spencer Bay
County:	Hyde
Acreage:	2,966 GIS
Tax Value:	$1,522,020
Property Owner/Representative:	1610 Wolfpack Partnership (Project Lead-NC Coastal Land Trust-Janice Alle
Phone:	
Email Address:	
Address:	

Primary Purpose:

X	Resource Protection
X	Resource Management
	User Access
X	WRC Facility

Program Potential:

X	Game Land
	Wildlife Conservation Area
	Access Area
	None

Type of Acquisition:

X	Purchase
	Lease
	Easement

Type of Parcel:

X	Tract
	Riparian Corridor

Grant Potential:

X	CWMTF
	Federal Aid (PR, WB, etc.)
X	Other (NC EEP/NAWCA)
X	Other

Owner Interest:

X	High
	Moderate
	Low
	No

Tax Value:

2009	Year Assessed
	PUV?

Stewardship Considerations:

PR	Source:
75/25	Match:

Funding Considerations:

	Donation
	Bargain Sale
X	Partner Contribution

Reviewed Appraisal & Purchase Req?

	Yes
	No
X	N/A

Recommendation:

X	Pursue
	Do Not Pursue
	Defer

Additional Comments:

Coastal Land Trust has taken the lead on acquiring this property. They have applied for, and have been granted, a Land and Water Fund Grant of $1,973,360 and a NAWCA grant of $1,500,000. Coastal Land Trust is seeking a Ducks Unlimited partnership of $250,000 and NCWRC contribution of $700,000.

April 19, 2023

North Carolina Wildlife Resources Commission
Land Acquisition Investigation Form
– PHASE I: INITIAL INVESTIGATION –

Tract Name:	Spencer Bay
County:	Hyde

Resources Assessment and Biological Benefits (brief):

Tidal Brackish Marshes make up 82% of the tract (2,513 acres). The remaining 18% (453 acres) consist of a 214-acre submerged aquatic vegetation impoundment, Non-riverine Wet Flat Forests, Pocosin Woodlands, Maritime Pinelands, Coniferous Regeneration, and a few small Peatland Atlantic White Cedar stands. The tracts are bordered in part by Abel Bay, Spencer Bay, Germantown Bay, Lightwood Snag Bay, and Rose Bay, which are identified as either Primary or Permanent Secondary Fishery Nursery Areas. A 2.2 mile road accesses the westernmost tract, waterfowl impoundment, house and boat ramp. The house rests on stilts and includes a larger kitchen and dining area, a large living room, a small bathroom and 2 very small bedrooms. A large screened porch and a large unscreened porch overlook the Pamlico Sound.

Tract Name	**Spencer Bay**
Date	**April 19, 2023**
Staff Completing Form	**David Turner**

Species	**0.481**
	Terrestrial
Overall Biodiversity	1
SGCN Species	2
Game Species	1
	Wetland
Overall Biodiversity	1
SGCN Species	3
Game Species	1
	Aquatic
Overall Biodiversity	1
SGCN Species	2
Game Species	1

Comments

There are 63 Species of Greatest Conservation Need (SCGN) identified as possibly occurring on the tract by the North Carolina Wildlife Habitat Threat Data Viewer and Analysis Tool. The primary species would be associated with the marsh and impoundment habitats. American black duck may nest on the fringes of the marsh. A large flock of white pelicans were resting on impoundment during the site visit. Game species, other than waterfowl, could include some of the rails. Deer and bear numbers would be limited by the small amounts of suitable habitat.

Habitat	**0.667**
Size	2
Quality	3
Diversity	1
Rare/Important	2
Connectivity	3
Buffer	1

Comments

The project consists of 3 tracts. The main tract is sandwiched between Abel Bay and Spencer Bay. The other two are between the Spencer and Germantown bays and Rose Bay. Just east lies Swan Quarter National Wildlife Refuge. A unique feature of the project is the brackish waterfowl impoundment that is currently managed for submerged aquatics.

Public Access	**0.444**
Hunting/Viewing	3
Fishing	1
Boating	0

Comments

The main tract has vehicular access from a DOT road. The two eastern tracts have no vehicular access, access would only be by boat from the Rose Bay BAA.

Wildlife Uses	**0.267**
Hunting	2
Viewing	1
Fishing	1
Boating	0
Education	0

Comments

Waterfowl hunting the impoundment should be managed through permit. The impoundment is wide open and blinds would likely need to be installed to provide concealment. Some deer and possible limited bear hunting may occur on the forested section, though the use of chase dogs may need to be restricted. Waterfowl hunting the tracts perimeter would be extremely popular as State ownership would assure hunters they are hunting on public land.

Other Values	**0.222**
Timber Harvest	1
Local Economy	1
Quality of Life	0

Comments

Increased hunting opportunities may lead to an increase in food, gas, and lodging sales. A small section of pines may be able to be harvested.

Feasibility & Logistics	**0.533**
Existing Infrastructure	1
Compatibility of Multiple Uses on Tract	2
Compatibility with Adjoining Land	3
Inholding/Corridor	1
Proximity to Users	1

Comments

There is only one road to access the main tract. To limit disturbance, it is suggested to gate a portion of this road north of the impoundment. The house could act as a field house or be used in the R3 program.

Restoration/Mitigation Potential	**0.167**
Species Restoration	1
Habitat Restoration	1
Access Improvement	0
Threat Mitigation	0

Comments

A large portion of the main tract marsh can be burned that may benefit nesting black ducks and black rail.

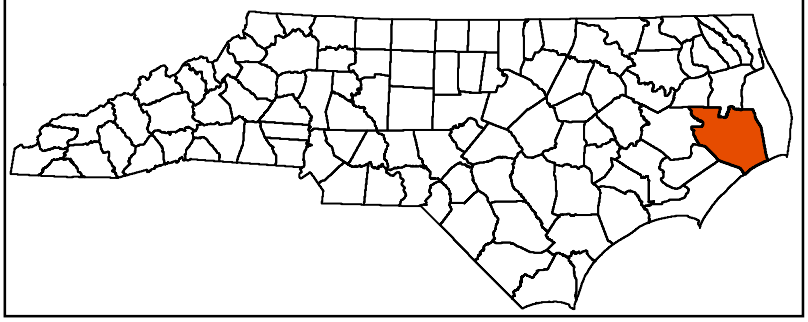
Threats	**0.667**
Number	2
Severity	2
Imminence	3
Manageability	3
Management Cost	0

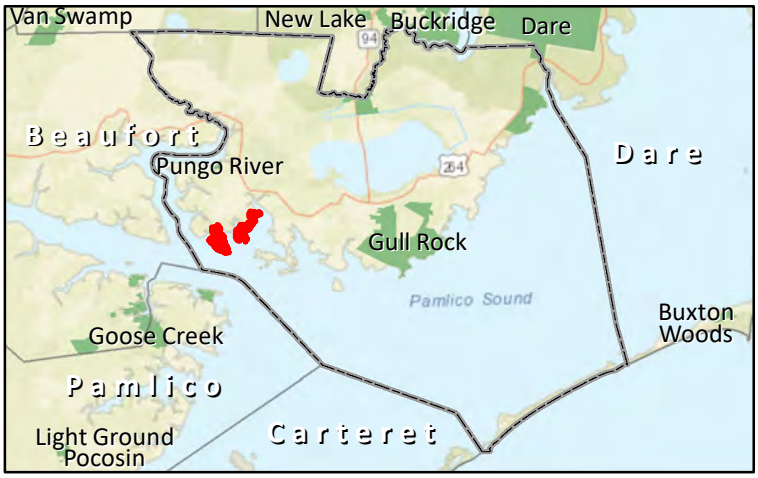
Comments

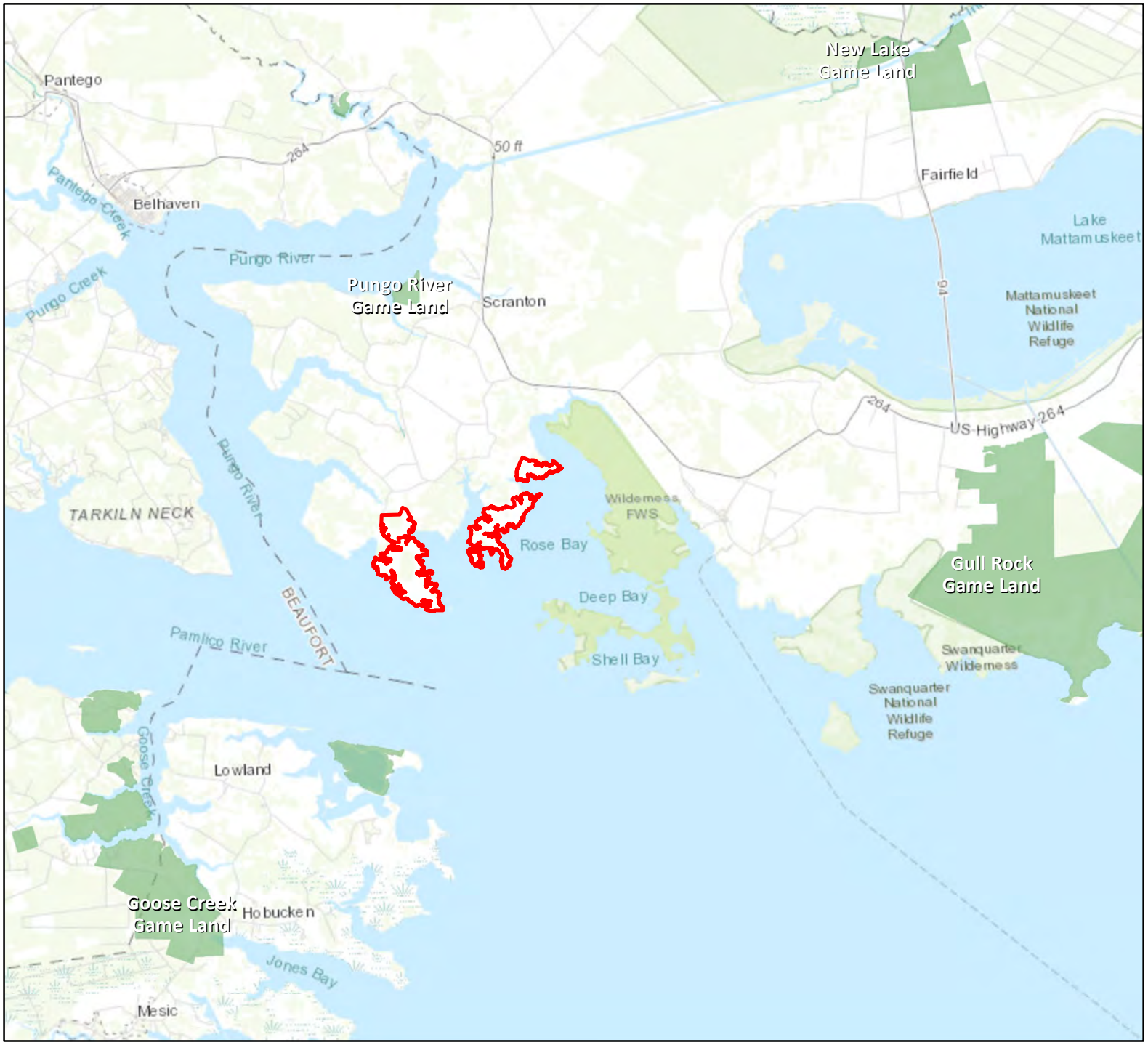
Sea level rise and marsh erosion will continue to threaten all three tracts.

Overall Score	**2.115**

Spencer Bay Tracts
Hyde County
2,966 Acres







Spencer Bay Tracts

Game Land

0 3 6

Miles

N

W E

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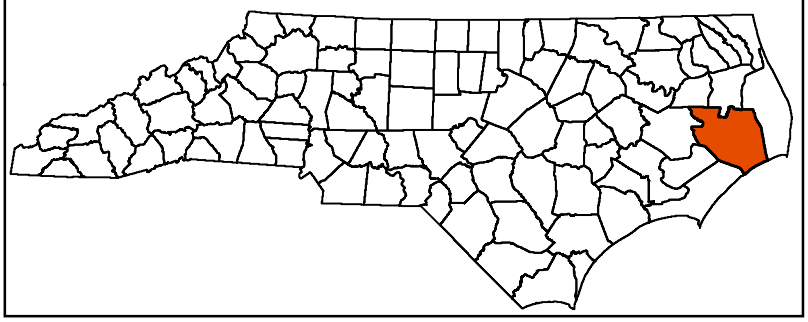
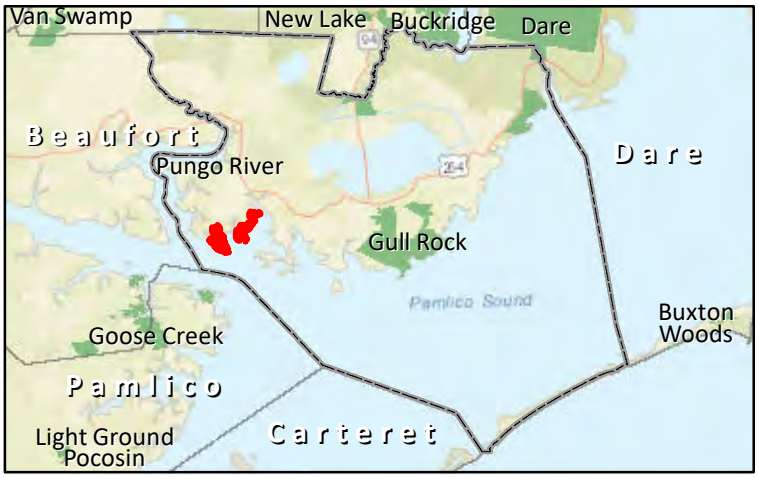
Spencer Bay Tracts
Hyde County
2,966 Acres





Spencer Bay Tracts

Game Land

0 0.5 1
Miles

N
W E
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Exhibit D-5

July 13, 2023

North Carolina Wildlife Resources Commission
Land Acquisition Investigation Form

Phase II: FINAL ACQUISITION DETAILS

Tract Name: *Paynes Branch*

WRC Action/Approval to Pursue (Date): 4/19/2023

Acquisition Plan (specify total project costs AND sources of funding):

Acquisition through The Conservation Fund

Pittman Robertson	*$ 154,500*
NFWF Coal Ash Funds	*$ 150,000*
Private	*$ 304,500*
TOTAL COST	***$ 609,000***

Acquisition Plan Includes Bargain Sale? ☒Yes ☐No ☐N/A
If Yes, Explain Details:

Total Cost Based on Appraisal? ☒Yes ☐No ☐N/A

If Yes, Describe in Table:

Requested By	Appraiser	Effective Date	Appraised Value
The Conservation Fund	*Michael Smith*	*05/01/23*	*$609,000*

Appraisal Handled by State Property Office? ☐Yes ☒No ☐N/A

Source(s) of Stewardship Funds (indicate federal:state match rates):
Federal Assistance Grant – 75% federal: 25% state

Five-Year Stewardship Costs & Revenue Projections (worksheet attached):

Total Stewardship Expenditures	*$ 7,093.00*
Total Projected Revenue	*$ 0.00*

Exhibit D-5

July 13, 2023

North Carolina Wildlife Resources Commission
Land Acquisition Investigation Form

Phase II: COSTS AND REVENUE WORKSHEET

Estimated Five Year Stewardship Costs and Revenue Projections:

Estimated Stewardship Costs				
Activity	**Quantity**	**Unit**	**Unit Cost**	**Total Cost**
Boundary Establishment	*2.81*	*Mile*	*$300*	*$843*
Establish Parking Area	1	*Each*	*$4,500*	*$4,500*
Kudzu Treatment	*7*	*Acres*	*$250*	*1,750*
TOTAL				***$7,093.00***

Estimated Revenue Projections				
Source	**Quantity**	**Unit**	**Unit Revenue**	**Total Revenue**
				$0
TOTAL				***$ 0***

April 19, 2023
North Carolina Wildlife Resources Commission
Land Acquisition Investigation Form
– PHASE I: INITIAL INVESTIGATION –

WRC Staff Contact:	Chris Dawes/Chris Baranski
Date First Presented to Commission:	April 19, 2023
Tract Name:	Paynes Branch Tract
County:	Forsyth/Stokes
Acreage:	209 acres total (178 in Forsyth; 31 in Stokes)
Listed Price:	$609,000
Tax Value:	$483,500
Property Owner/Representative:	The Conservation Fund
Phone:	
Email Address:	
Address:	

Primary Purpose:

X	Resource Protection
	Resource Management
	User Access
	WRC Facility

Program Potential:

	Game Land
X	Wildlife Conservation Area
	Access Area
	None

Type of Acquisition:

X	Purchase
	Lease
	Easement

Type of Parcel:

X	Tract
	Riparian Corridor

Grant Potential:

	CWMTF
X	Federal Aid (PR, WB, etc.)
	NC Land and Water Fund
X	TCF Funds

Owner Interest:

X	High
	Moderate
	Low
	No

Tax Value:

2022	Year Assessed ($483,500.00)
	PUV?

Stewardship Considerations:

	Source:
	Match:

Funding Considerations:

	Donation
	Bargain Sale
X	Partner Contribution

Reviewed Appraisal & Purchase Requirements?

X	Yes (Appraised 8/26/21 $609,000)
	No
	N/A

Recommendation:

X	Pursue
	Do Not Pursue
	Defer

Additional Comments:

A site visit on this property was performed on December 20, 2022 by Chris Dawes, Chris Teague, Bronson Hannah, and Mike Leonard (with The Conservation Fund). Acquisition of this tract would add ~209 acres as a Wildlife Conservation Area or possibly game land in an underserved area of the state near the Town of Rural Hall and located on the Forsyth/Stokes County Line. Acquisition of this tract may open the possibility for purchasing an additional 488-acre tract to the north that adjoins the 209-acre Paynes Branch Tract. The property has also been looked at by Piedmont Land Conservancy to serve as a nature preserve under their ownership. The Conservation Fund has received donations totaling approximately $340,000.00 and are looking for a partners to cover the remaining $269,000.00 needed to close on the tract. Significant aquatic resources well downstream would be enhanced/conserved by the added watershed protection along Paynes Branch (~1.03 mi.), which flows into Town Fork Creek (~1.1 miles away), and ultimately at the confluence with the Dan River an additional ~15 miles downstream.

April 19, 2023

North Carolina Wildlife Resources Commission
Land Acquisition Investigation Form
– PHASE I: INITIAL INVESTIGATION –

Tract Name:	Paynes Branch Tract
County:	Forsyth and Stokes Counties

Resources Assessment and Biological Benefits (brief):

This available property (two combined parcels) lies mostly in Forsyth County (Parcel 1 - 178 aces), with a smaller portion in Stokes County (Parcel 2 - 31 acres). The tract is predominately comprised of low-grade hardwoods such as red maple, sweetgum, and yellow poplar, with some nice beech trees scattered on the side-slopes. Very few oaks exist on the property and the small ridge-tops located mostly along the boundaries of the tract are forested with Virginia pine. The topography is steep with an elevation difference of approximately 220 feet from Paynes Branch up to the highest ridge-tops. The hunting opportunities would be deer, turkey, and squirrel hunting by permit only. The tract is dissected by Paynes Branch (~1.03 mi.) which is a small (less than 10-foot wide) shallow stream with a rocky substrate. It is unlikely to support much aquatic diversity. However, downstream in the watershed, particularly in Town Fork Creek and far below in the Dan River, there are numerous priority mussel and fish species (see worksheet comments). Water quality integrity afforded by the protection of Paynes Branch would prevent some potential sedimentation and habitat degradation for these species. Public access is on the southeast side of the property off Edwards Road. Developmental pressures (residential) have encroached significantly nearby from Rural Hall (less than one mile away) and Germanton (just to the east). The surrounding landscape has been greatly fragmented by small parcels and this is expected to continue with the growth in the area. The project was not funded in the 2022 NCLWF cycle when submitted by The Conservation Fund but NFWF Coal Ash Funds have been secured for this acquisition.

Tract Name	**Paynes Branch Tract**
Date	**January 30, 2023**
Staff Completing Form	**Chris Baranski, Chris Dawes, and Chris Teague**

Species	**0.333**
	Terrestrial
Overall Biodiversity	2
SGCN Species	2
Game Species	2
	Wetland
Overall Biodiversity	0
SGCN Species	0
Game Species	0
	Aquatic
Overall Biodiversity	1
SGCN Species	2
Game Species	0

Comments

Overall Biodiversity for this property is low since almost the entire tract is the same habitat type of middle-aged low-grade hardwoods on the slopes and in the draws, with dense Virginia pine on the ridge-tops that completely shade the forest floor. Likely/Potentially occurring SGCN's: Numerous neo-tropical migratory birds (seasonally), Black-capped Chickadee, Eastern Wood-pewee, Box Turtle, and Northern Two-lined, Marbled, and Spotted Salamanders ---- [Natural Heritage Element Occurrences {downstream and nearby}: Moxostoma ariommum (Bigeye Jumprock) S1/G4 and Silphium connatum (Virginia Cup-plant) S2/G3; {farther downstream} Percina rex (Roanoke Logperch) S2/G5, Etheostoma podostemone (Riverweed Darter) S3/G4, and Lasmigona subviridis (Green Floater) S1/G3] ---- WRC records of non-game priority aquatic species well downstream in the Dan River also include Parvaspina collina (James Spinymussel), Fusconaia masoni (Atlantic Pigtoe), Lampsilis cariosa (Yellow Lampmussel), and Villosa constricta (Notched Rainbow).

Habitat	**0.333**
Size	2
Quality	1
Diversity	1
Rare/Important	0
Connectivity	2
Buffer	0

Comments

The tract is relatively small at 209 acres and is mostly low-grade hardwoods and Virginia pine, with the exception of two small openings (overtaken by kudzu), and the narrow riparian corridor immediately adjacent to the creek. Habitat quality and diversity is low and the tract is unlikely to support any rare or imperiled species. (There are no known NHEO's on the tract.) Acquisition would provide a buffer along the portion of Paynes Branch that dissects the property.

Public Access	**0.333**
Hunting/Viewing	3
Fishing	0
Boating	0

Comments

Public access is high for hunting and wildlife-associated recreation due to the lack of available public lands nearby. There is one access point on the southeast side along Edwards Road. A small parking area would be needed for safe access. There are no navigable or fishable water

Wildlife Uses	**0.467**
Hunting	3
Viewing	2
Fishing	0
Boating	0
Education	2

Comments

Hunting opportunities are limited for deer, turkey, and squirrel and would have to be by permit-only. There is no public access game land nearby which presents a unique opportunity to the area. There are no boating or fishing opportunities on this property.

Other Values	**0.556**
Timber Harvest	0
Local Economy	3
Quality of Life	2

Comments

Timber harvest opportunities are low or nonexistent due to topography and the fact that Paynes Branch traverses through the middle of the property.

Feasibility & Logistics	**0.400**
Existing Infrastructure	0
Compatibility of Multiple Uses on Tract	1
Compatibility with Adjoining Land	0
Inholding/Corridor	2
Proximity to Users	3

Comments

There is only one access into the property via Edwards Road on the southeast side of the property; no other infrastructure exists. The property lies within one mile of the town of Rural Hall.

Restoration/Mitigation Potential	**0.333**
Species Restoration	1
Habitat Restoration	1
Access Improvement	1
Threat Mitigation	1

Comments

Timber management and Rx fire are not options on this property. The two small open areas on the property are grown up with kudzu and are not accessible with wheeled equipment; backpack spraying would have to be utilized to treat these infestations.

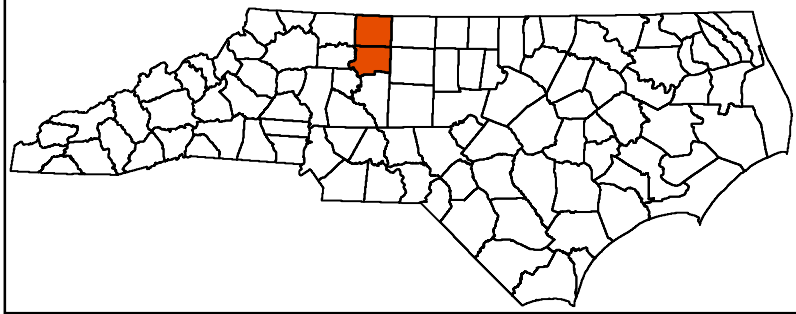
Threats	**0.533**
Number	2
Severity	1
Imminence	1
Manageability	2
Management Cost	2

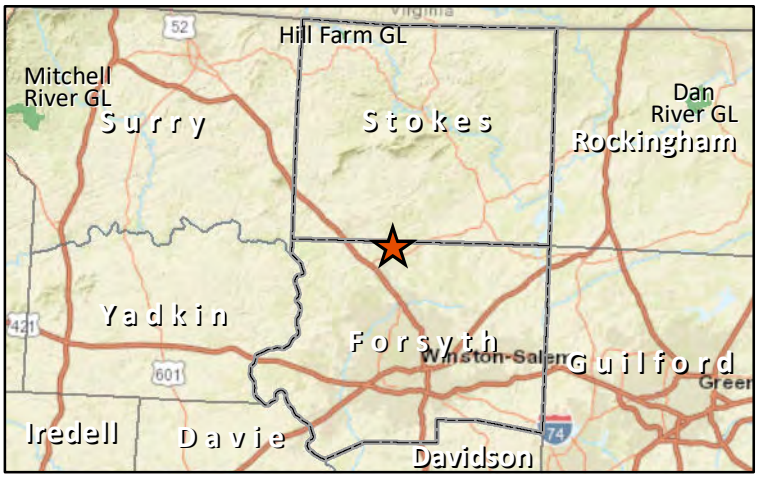
Comments

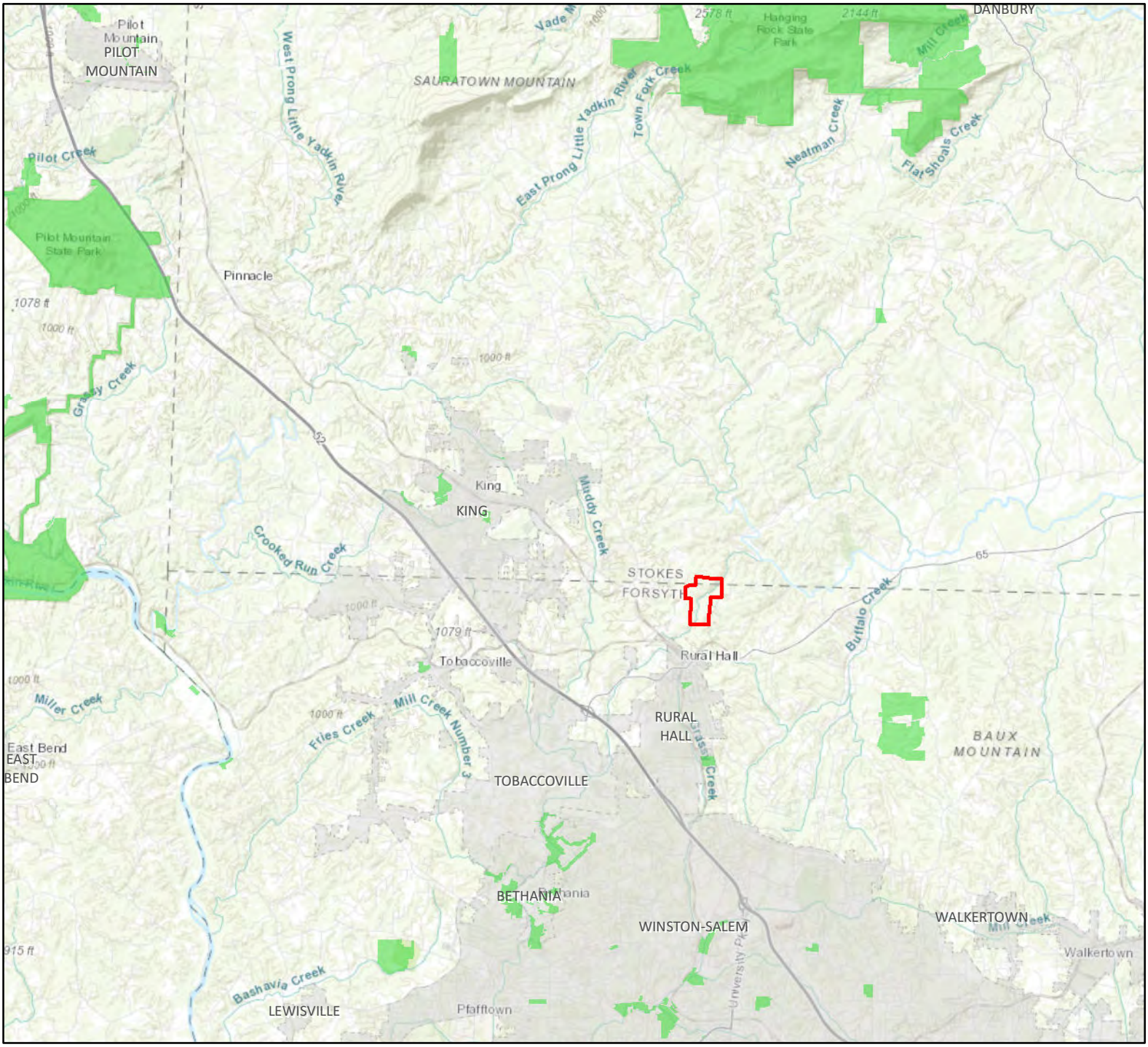
The tract is located within a mile of the Rural Hall town limits and the threat of adjacent development is high. It is also surrounded by multiple small tracts that may affect the use of firearms in the future. Residential development sprawling from Rural Hall and Germanton has led to widespread habitat fragmentation and hundreds of nearby private parcels.

Overall Score	**2.222**

Payne Branch Tract
Forsyth and Stokes Counties
209 Acres Total







Paynes Branch Property

NHP Managed Areas for Conservation

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Miles

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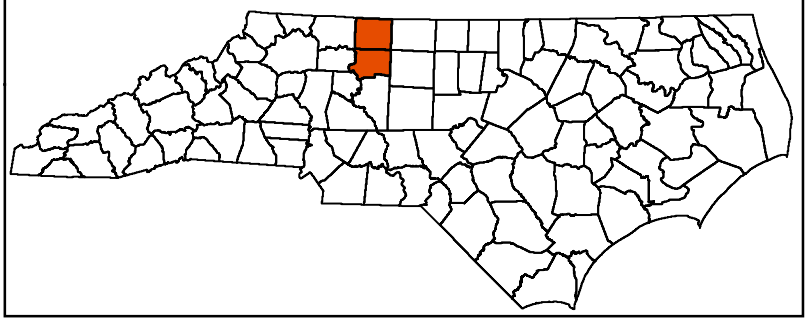
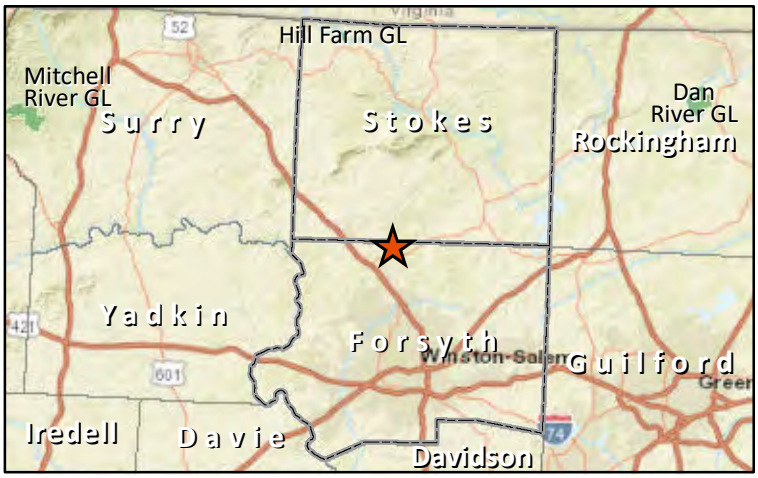
Payne Branch Tract
Forsyth and Stokes Counties
209 Acres Total





Paynes Branch Property

0 0.1 0.2
Miles

N
W E
S

EXHIBIT E-1

July 13, 2023

NORTH CAROLINA WILDLIFE RESOURCES COMMISSION

Cameron Ingram, Executive Director

July 13, 2023

MEMORANDUM

TO: Daron Barnes, Division Chief
Land and Water Access

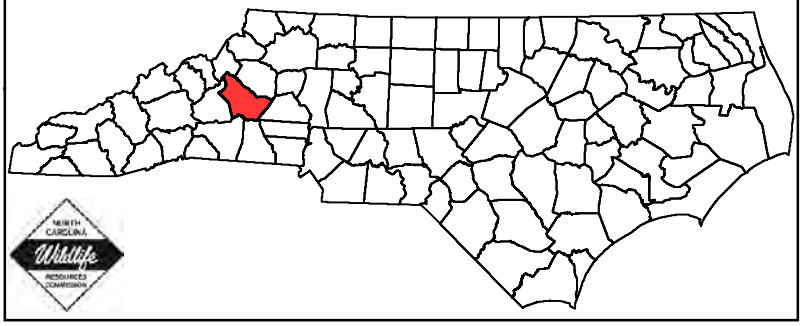
FROM: Ben Solomon, Assistant Chief and Land Acquisition Manager
Land and Water Access

SUBJECT: North Bend BAA Easement Request - Burke County

Duke Energy seeks a riparian conservation easement on the North Bend Boating Access Area tract in Burke County. This tract of land was once owned by Duke Energy and this conservation easement is a requirement of their FERC license. The total easement area is approximately 2.80 acres.

This easement was a part of the original acquisition agreement with Duke Energy, and.staff recommend Commission approval to grant this easement.

North Bend BAA - Conservation Easement
Burke County
2.8 Acres



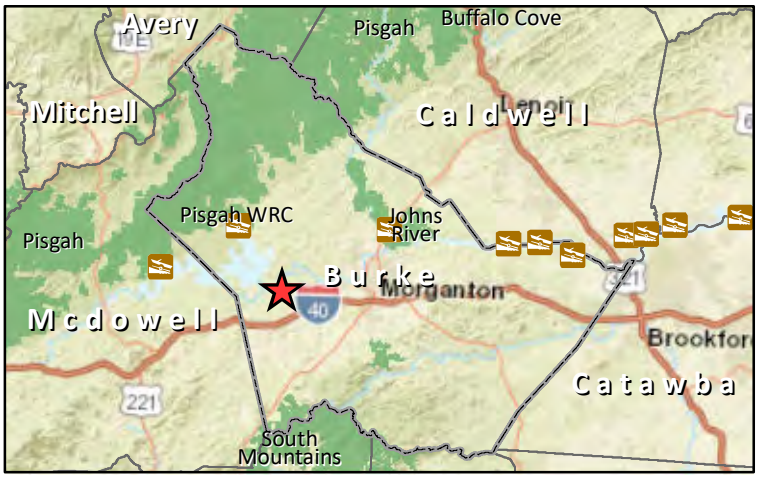


EXHIBIT E-2

July 13, 2023

NORTH CAROLINA WILDLIFE RESOURCES COMMISSION

Cameron Ingram, Executive Director

July 13, 2023

MEMORANDUM

TO: Daron Barnes, Division Chief
Land and Water Access

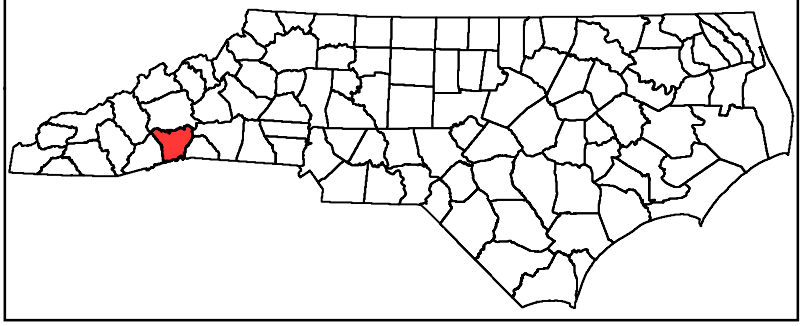
FROM: Ben Solomon, Assistant Chief and Land Acquisition Manager
Land and Water Access

SUBJECT: DOT Easement Request - Henderson County

NCDOT seeks to purchase a permanent Right-of-Way easement, drainage easement, utility easement, and temporary construction easement for a bridge project in Henderson County.

Staff recommend seeking Commission approval to grant these easements to NCDOT with compensation set at $37,075.00 as determined by the NC State Property Office.

DOT Right of Way and Easement Request
Kings Bridge Conservation Area
Henderson County



NORTH CAROLINA Wildlife RESOURCES COMMISSION

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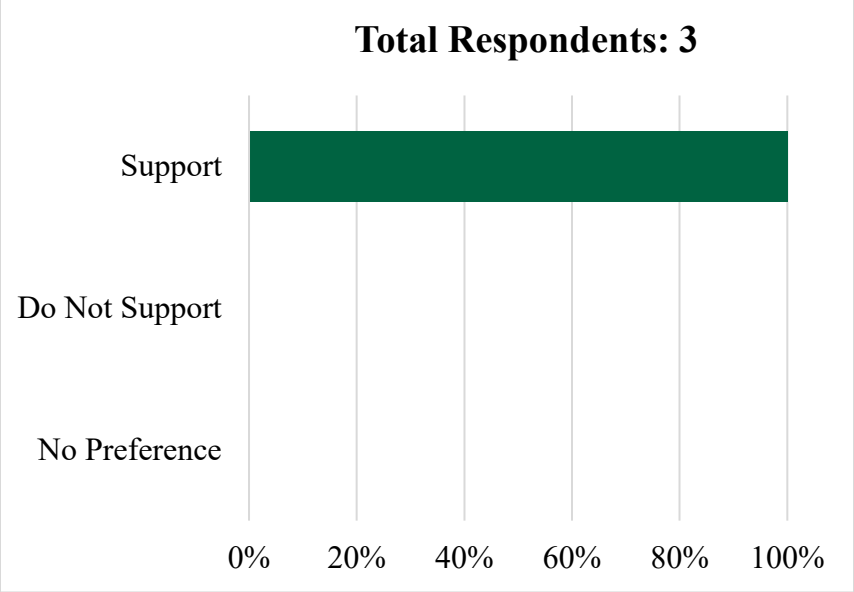
EXHIBIT F-1

July 13, 2023

Public Comments for 15A NCAC 10B .0113
Big Game Harvest Reports



Choices	Responses	
Support	100%	3
Do Not Support	0%	0
No Preference	0%	0
Total		**3**

District	1	2	3	4	5	6	7	8	9	NC - Not Specified	Out of State	Totals
Support	-	-	1	-	-	1	-	-	-	1	-	**3**
Do Not Support	-	-	-	-	-	-	-	-	-	-	-	**-**
No Preference	-	-	-	-	-	-	-	-	-	-	-	**-**
Total	**-**	**-**	**1**	**-**	**-**	**1**	**-**	**-**	**-**	**1**	**-**	**3**

Big Game Harvest Reports Comments

Number	Comment
1	I am in support as long as the automated call in option remains a possibility. Often apps need a little better service than a phone call.

EXHIBIT F-2

July 13, 2023

Proposed Amendment to 15A NCAC 10B .0113 - Big Game Harvest Reports Recommended by Agency Staff for Adoption

Title 15A NCAC 10B .0113 – Big Game Harvest Reports
The proposed amendments to 10B .0113 expand the recording and reporting options to include new technology WRC implemented as part of the transition to a third-party license vendor, which will allow hunters to validate and register their big game harvests through the WRC mobile app.

15A NCAC 10B .0113 BIG GAME HARVEST REPORTS (Pgs. 2-4)

15A NCAC 10B .0113 is proposed for amendment as follows:

15A NCAC 10B .0113 BIG GAME HARVEST ~~REPORTS~~ REPORTING

(a) Definitions. The following definitions shall apply in this Rule:

(1) "Authorization number" means the number or code issued by the ~~Electronic Big Game Reporting System~~ Commission upon completion of big game harvest registration, which shall serve as proof of registration and allow continued possession of the carcass.

(2) "Big Game" means bear, wild turkey, and white-tailed deer, as defined in G.S. 113- 129.

(3) "Big Game Harvest Report Card" means the non-transferrable physical or electronic reporting card ~~supplied~~ issued to ~~the hunter~~ an individual by the Commission as part of ~~the~~ their big game license, upon which ~~the successful hunter validates and records~~ they validate and record the authorization ~~n~~number for a big game harvest.

(4) "DMAP" means Deer Management Assistance Program as defined in G.S. 113-291.2(e).

(5) "Field Dress" means the bleeding or removal of the digestive, respiratory, and circulatory organs.

~~(5)~~(6) "Validate" or "validation" means electronically recording a harvest or cutting or punching-out the day and month of the harvest ~~occurred~~ on the ~~appropriate line of the~~ Big Game Harvest Report Card or Bonus Antlerless Deer Harvest Report Card or ~~by~~ affixing a Commission-issued DMAP tag. ~~Deer Management Assistance Program (DMAP) tag, as required by G.S. 113-291.2(e).~~

~~(6)~~(7) "Register" or "Registration" means the process by which the big game harvest ~~of big game~~ is reported ~~through the Electronic Big Game Reporting System~~ to the Commission and an authorization number is ~~issued.~~ issued by the Commission.

~~(7)~~(8) "Remote Area" means an area where ~~access to the Electronic Big Game Reporting System~~ cellular phone signal, internet access or the Mobile app is unavailable.

~~(8)~~(9) "Site of kill" or "site of harvest" means the location that a person takes possession of harvested big game.

~~(9)~~(10) "Successful hunter" means a person that has lawfully taken and reduced to possession a big game animal.

(11) "Mobile app" means a unique Commission application that may be downloaded to a mobile device allowing successful hunters to validate and register a big game harvest.

(b) Any individual hunting big game animals, including license exempt individuals, shall have an electronic or paper version of the Big Game Harvest Report Card, Bonus Antlerless Deer Harvest Report Card, or DMAP tag pursuant to G.S. 113-291.2, on their person while hunting.

(c) Validation. ~~The~~ A successful hunter shall validate ~~the~~ their Big Game Harvest Report Card or the Bonus Antlerless Deer Harvest Report Card or affix a Commission-issued DMAP tag before moving any big game from the site of kill. ~~Deer harvested pursuant to the Deer Management Assistance Program (DMAP), that are not validated by the Big Game Harvest Report Card or the Bonus Antlerless Deer Harvest Report Card, shall be validated by affixing a Commission-issued DMAP tag.~~

~~(c)~~ (d) Field Dressing. Harvested big game may be field dressed at the site of kill or before registration. Further processing that obscures the identification of the harvested animal's species, age, or sex shall be prohibited without a valid authorization number.

~~(d)~~(e) Registration. Harvested big game shall be registered via ~~the Electronic Big Game Reporting System~~ the Commission's mobile app, online at ~~www.newildlife.org or~~ www.ncwildlife.org, by calling ~~1-800-446-8663.~~ 1-800-446-8663, or as described in the DMAP license. Harvested big game shall be registered before the animal is:

(1) skinned; or

(2) dismembered; or

(3) left unattended by the successful hunter; or

(4) placed in the possession of another person.

Harvested big game animals that are not skinned, dismembered, left unattended by the successful hunter, or placed in the possession of another person, shall be registered by 12pm noon the day following the harvest.

~~(e)~~(f) Registration in Remote Areas. Big game harvested in remote areas shall be registered by 12pm noon, the day after leaving the remote area. Notwithstanding the registration requirements in Paragraph (~~d~~e) of this Rule, big game harvested in remote areas may:

(1) be placed in the possession of another, provided that the person in possession of the big game has the successful hunter's name and date of kill on their person; and

(2) be skinned and dismembered before registration, if the carcass cannot be transported intact.

~~(f)~~(g) Authorization number. Successful hunters using the paper Big Game Harvest Report Card or Bonus Antlerless Deer Harvest Report Card, the ~~The~~ authorization number shall be recorded in the space provided for the appropriate harvested big game animal. ~~animal on the Big Game Harvest Report Card or on the Bonus Antlerless Deer Harvest Report Card.~~ Successful hunters ~~validating a deer harvest by affixing~~ using a Commission-issued DMAP tag shall record and maintain the authorization number ~~upon registration.~~ as described in the DMAP license.

~~(g)~~(h) Unattended Harvests. Except as otherwise provided by rule or law, successful hunters that leave a harvested big game animal unattended or in the possession of another person shall identify the carcass by attaching the authorization number issued at the time of registration. Except as provided in Paragraph ~~(e)~~ (f) of this Rule, a person that takes possession of a big game animal from a successful hunter shall retain the authorization number of that animal.

~~(h) Exceptions. Requirements of this Rule shall not be applicable to special deer tags issued pursuant to G.S. 113-291.2(e).~~

~~(i) Any person hunting big game animals, including license exempt persons, shall have a valid Big Game Harvest Report Card, valid Bonus Antlerless Deer Harvest Report Card, or special tag pursuant to G.S. 113-291.2 in their possession. The Big Game Harvest Report Card or Bonus Antlerless Deer Harvest Report Card is part of the big game license and shall not be transferrable.~~

~~(j) Any persons who has requested a Big Game Harvest Report Card by phone or internet but has not yet received the Big Game Harvest Report Card by mail, shall validate the kill by affixing the harvest ID number provided by the Commission to the carcass and shall register in accordance with Paragraphs (d) or (e) of this Rule. The successful hunter shall retain all authorization numbers from reported harvests and shall transcribe those authorization numbers~~

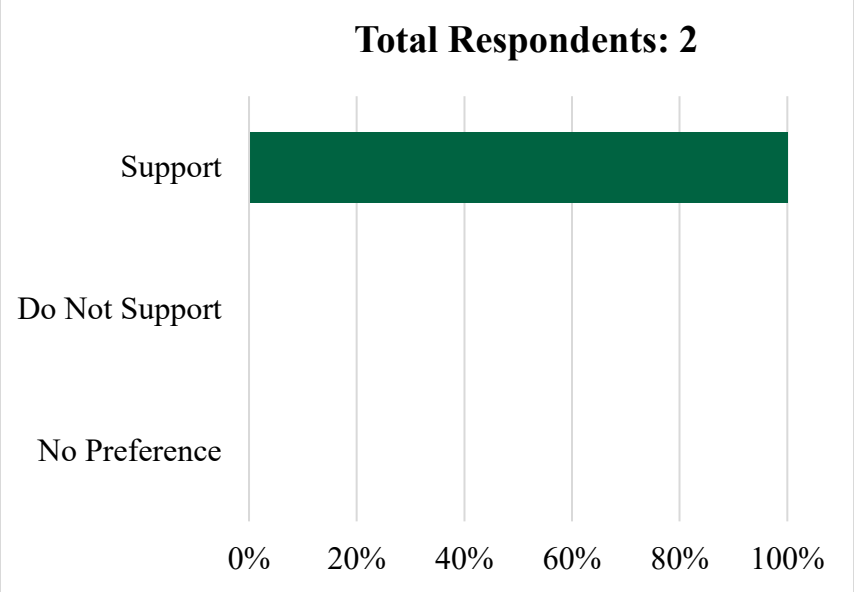
~~Big Game Harvest Report Card upon receipt of the card.~~

History Note: *Authority G.S. 113-134; 113-270.3; 113-276.1; 113-291;*
Eff. February 1, 1976;
Amended Eff. July 1, 1998; July 1, 1997; July 1, 1995; July 1, 1994; July 1, 1993; July 1, 1989;
Temporary Amendment Eff. July 1, 1999;
Amended Eff. August 1, 2017; August 1, 2012; August 1, 2010; June 1, 2009; May 1, 2007; May 1, 2004; July 1, 2000;
Readopted Eff. August 1, 2020.

EXHIBIT G-1

July 13, 2023

Public Comments for 15A NCAC 10F .0102
Application for Certificate of Vessel Number



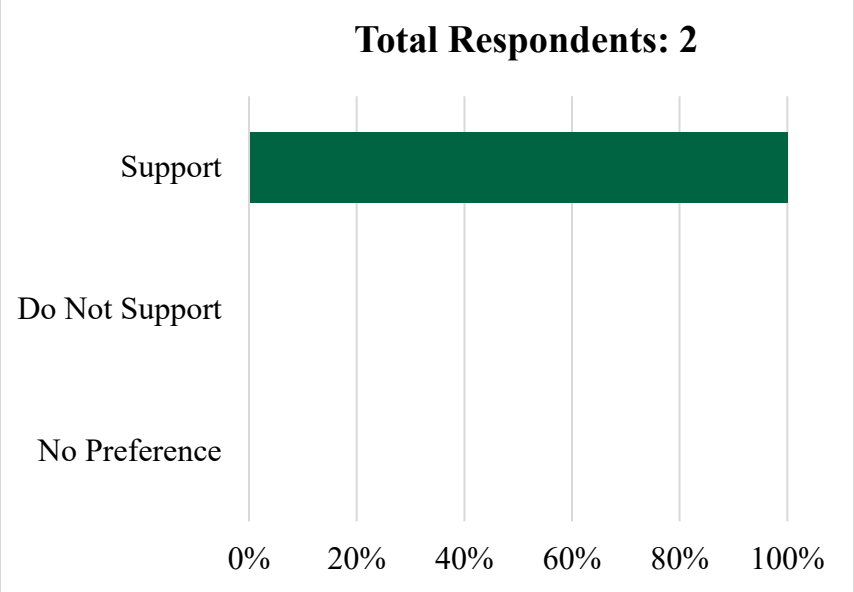
Choices	Responses	
Support	100%	2
Do Not Support	0%	0
No Preference	0%	0
Total		**2**

District	1	2	3	4	5	6	7	8	9	NC - Not Specified	Out of State	Totals
Support	-	-	-	-	-	1	-	-	-	1	-	**2**
Do Not Support	-	-	-	-	-	-	-	-	-	-	-	**-**
No Preference	-	-	-	-	-	-	-	-	-	-	-	**-**
Total	**-**	**-**	**-**	**-**	**-**	**1**	**-**	**-**	**-**	**1**	**-**	**2**

EXHIBIT G-1

July 13, 2023

Public Comments for 15A NCAC 10F .0104
Certificate of Number



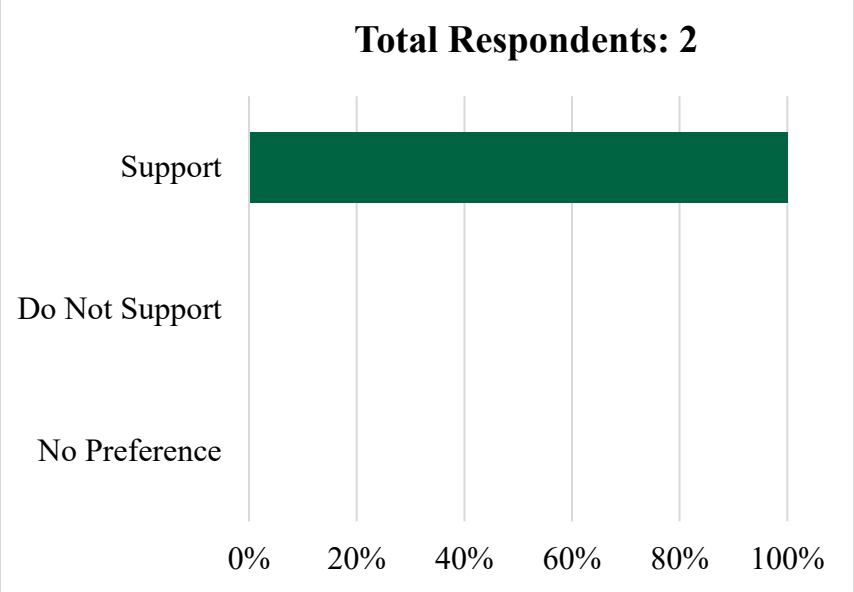
Choices	Responses	
Support	100%	2
Do Not Support	0%	0
No Preference	0%	0
Total		**2**

District	1	2	3	4	5	6	7	8	9	NC - Not Specified	Out of State	Totals
Support	-	-	-	-	-	1	-	-	-	1	-	**2**
Do Not Support	-	-	-	-	-	-	-	-	-	-	-	**-**
No Preference	-	-	-	-	-	-	-	-	-	-	-	**-**
Total	**-**	**-**	**-**	**-**	**-**	**1**	**-**	**-**	**-**	**1**	**-**	**2**

EXHIBIT G-1

July 13, 2023

Public Comments for 15A NCAC 10F .0109
Temporary Certificate of Number



Choices	Responses	
Support	100%	2
Do Not Support	0%	0
No Preference	0%	0
Total		**2**

District	1	2	3	4	5	6	7	8	9	NC - Not Specified	Out of State	Totals
Support	-	-	-	-	-	1	-	-	-	1	-	**2**
Do Not Support	-	-	-	-	-	-	-	-	-	-	-	**-**
No Preference	-	-	-	-	-	-	-	-	-	-	-	**-**
Total	**-**	**-**	**-**	**-**	**-**	**1**	**-**	**-**	**-**	**1**	**-**	**2**

EXHIBIT G-2

July 13, 2023

Proposed Amendments to 15A NCAC 10F .0100 - Motorboat Registration Recommended by Agency Staff for Adoption

Title 15A NCAC 10F .0100 - Motorboat Registration
As the Commission worked through database conversion from ALVIN to Brandt, updates were needed to our vessel data collection points and certificate of number terminology to match United States Coast Guard regulations. In making these changes, rules 10F .0102, .0104, and .0109 have been updated with technical and terminology changes.

15A NCAC 10F .0102 APPLICATION FOR CERTIFICATE OF VESSEL NUMBER (Pgs. 2-5)
15A NCAC 10F .0104 CERTIFICATE OF NUMBER (Pgs. 6-8)
15A NCAC 10F .0109 TEMPORARY CERTIFICATE OF NUMBER (Pgs. 9-10)

15A NCAC 10F .0102 APPLICATION FOR CERTIFICATE OF VESSEL NUMBER

(a) Definitions. The definitions in G.S. 75A-2 shall apply throughout this Subchapter and to all forms prescribed pursuant to this Subchapter. As used in this Subchapter, the following definitions shall also apply:

(1) "Boating Accident" means a collision, accident, casualty, or occurrence involving a vessel or its equipment and resulting in:

(A) damage by or to the vessel, its equipment, or other property;

(B) injury or loss of life to any person; or

(C) the disappearance of any person from a vessel under circumstances that indicate the possibility of death or injury.

A "boating accident" includes capsizing, collision, foundering, flooding, fire, explosion, and the disappearance of a vessel other than by theft.

(2) "Certificate of Title" means a document that serves as evidence of ownership of a vessel.

(3) "Charter Fishing Vessel" means a vessel carrying passengers for hire who are engaged in recreational fishing.

~~(3)~~ (4) "Dealer" means a person, firm, or corporation engaged in the business of offering vessels for sale at retail or wholesale from an established location.

~~(4)~~ (5) "Government Agency Vessel" means a vessel owned and operated by the United States or a federal agency, a state, or a subdivision of a state.

~~(5)~~ (6) ~~"Livery Vessel"~~ "Rent or Lease Vessel" means a vessel that is rented or leased by the owners to an individual for a defined period of time.

~~(6)~~ (7) "Manufacturer" means a person, firm, or corporation engaged in the business of manufacturing vessels either upon prior commission or for the purpose of sale after manufacture.

~~(7)~~ (8) "Nonprofit Rescue Squad Vessel" means a vessel owned and operated by a nonprofit rescue squad exclusively for rescue purposes, including rescue training.

~~(8)~~ (9) "Proof of Ownership Document" means a document that provides evidence of ownership, including a Certificate of Number or a Certificate of Title issued by the Commission or any similar document issued by another state or country, an affidavit, a bill of sale, a manufacturer's statement of origin, or any other document that establishes ownership.

~~(9)~~ (10) "Vessel Agent" means an individual or business authorized by the Commission to conduct vessel transactions.

(b) General. The certificate of numbering and certificate of titling requirements of G.S. 75A-4, 75A-7, 75A-34, and 75A-35 shall apply to all vessels operated on the public waters of North Carolina, including ~~livery~~ rented and leased vessels, commercial fishing vessels, and commercial passenger vessels. Vessels operated pursuant to a dealer's or manufacturer's certificate of number for demonstration or testing purposes, government agency vessels, and non-profit rescue squad vessels shall not be subject to the titling requirements of G.S. 75A-34 and G.S. 75A-35 but shall remain subject to the certificate of numbering requirements of G.S. 75A-4 and G.S. 75A-7. Every owner applying for a certificate of number and certificate of title of a vessel, if applicable, shall apply to the Commission or to one of its

vessel agents using an application available on the Commission website at www.ncwildlife.org. The application shall include the following information:

(1) the name of the owners;

(2) the address, telephone number, date of birth, and North Carolina driver license number of the owners;

(3) the current or previous certificate of number, if applicable;

(4) the desired period of certificate of number, either one or three years;

(5) the primary ~~use~~ operation of the vessel:

(A) pleasure;

(B) ~~livery;~~ rent or lease;

(C) dealer or manufacturer demonstration;

(D) commercial fishing;

(E) commercial passenger;

(F) other commercial; ~~or~~

(G) ~~other;~~ charter fishing; or

(H) other.

(6) the model of the vessel, if known;

(7) the manufacturer, if known;

(8) the year of manufacture or model year, if known;

(9) the manufacturer's hull identification number, if any;

(10) the length of the vessel in feet and inches;

(11) the type of vessel:

(A) ~~open;~~ open motorboat;

(B) ~~cabin;~~ cabin motorboat;

(C) houseboat;

(D) personal watercraft;

(E) pontoon; ~~or~~

(F) ~~other;~~ air boat;

(G) auxiliary sail;

(H) inflatable;

(I) paddlecraft/canoe;

(J) paddlecraft/kayak;

(K) rowboat;

(L) sail only; or

(M) other.

(12) the hull material:

(A) wood;

(B) ~~metal;~~ aluminum;

(C) ~~fiberglass;~~ steel;

(D) ~~plastic;~~ fiberglass;

(E) ~~inflatable; or~~ rubber/vinyl/canvas;

(F) ~~other;~~ plastic; or

(G) other.

(13) the type of propulsion:

(A) ~~inboard;~~ propeller;

(B) ~~outboard;~~ sail;

(C) ~~inboard outdrive;~~ water jet;

(D) ~~sail;~~ manual;

(E) ~~auxiliary sail with inboard;~~ air thrust; or

(F) ~~auxiliary sail with outboard; or~~ other.

~~(G)~~ ~~jet Drive;~~

(14) the type of fuel:

(A) gasoline;

(B) diesel;

(C) electric; or

(D) ~~other;~~ other.

(15) the engine drive type:

(A) inboard;

(B) outboard;

(C) stern drive;

(D) pod drive;

(E) other; or

(F) none.

~~(15)~~ (16)a proof of ownership document;

~~(16)~~ (17)the signature of the owners;

~~(17)~~ (18)the make of motor if over 25 horsepower, including serial number and purchase price of ~~motor;~~ motor, if known;

~~(18)~~ (19)the lien holder name, address, and telephone ~~number;~~ number, if applicable;

~~(19)~~ (20)the effective lien ~~date.~~ date, if applicable;

~~(20)~~ (21)the county where vessel is taxed; and

~~(21)~~ (22)proof of United States Coast Guard documentation, if applicable.

(c) Application for certificate of number and certificate of title. The owners shall complete and submit an application for a certificate of number, proof of ownership documents, and applicable fees to the Commission or one of its vessel agents for processing within 15 days of the date of sale. A new certificate of number shall be issued for new or never-

before registered vessels. For a period of 60 days following the date of sale, the new owners may use a copy of the proof of ownership document as a temporary certificate of number pending receipt of the original certificate, provided it contains the date of sale. If required, a certificate of title shall be issued and all reported liens shall be recorded.

(d) ~~Livery~~ Rented or Leased Vessel Owners. Upon receipt of a completed application and a copy of the lease or rental agreement form and fee, the Commission shall issue to the applicant a certificate of number and, if applicable, a certificate of title.

(e) Dealers and Manufacturers of Vessels. Upon receipt of a completed application and fee, the Commission shall issue to the applicant a certificate of number that may be used in connection with the operation of any vessel in the possession of the dealer or manufacturer when the vessel is being demonstrated. Dealer and manufacturer certificates of number shall not be transferred. A new certificate of number shall be issued upon sale or transfer. Demonstration vessels shall not be titled so long as the vessel is owned by the dealer or manufacturer. Vessels owned or possessed by dealers or manufacturers for personal use or for any use other than for demonstration and testing purposes shall be individually registered in the name of the dealer or manufacturer in accordance with the certificate of number requirements of Paragraph (b) of this Rule. Additional dealer or manufacturer certificates of number may be obtained by making application in the same manner as prescribed for the initial certificate with payment of a fee for each additional certificate. Dealers and manufacturers may register individual vessels in accordance with Rule .0104(a) of this Section.

(f) Government Agency and Nonprofit Rescue Squad Vessels. Upon receipt of a completed application and proof of ownership documents from a government agency or non-profit rescue squad, the Commission shall issue to the applicant a permanent certificate of number. There shall be no fee for a permanent government agency or non-profit rescue squad certificate of number and the certificate shall be valid until the vessel is transferred to another government agency, an individual, a business, or a dealer. Government agency and nonprofit rescue squad registered vessels shall not be titled.

(g) Commercial Fishing Vessel. The standard application for a certificate of number shall be used for commercial fishing vessels with the term "commercial fishing" marked in the section designated for "primary use." Upon receipt of a completed application, proof of ownership document, and fee, the Commission shall issue to the applicant a certificate of number and, if applicable, a certificate of title.

(h) Commercial Passenger Vessel. Upon receipt of a completed application, proof of ownership document, and fee, the Commission shall issue to the applicant a certificate of number and, if applicable, a certificate of title.

15A NCAC 10F .0104 CERTIFICATE OF NUMBER

(a) General. Upon receipt of a completed application, a proof of ownership document, and the applicable fees as provided in G.S. 75A-5(a1) and G.S. 75A-5.2(c), the Commission shall issue to the applicant a certificate of number authorizing the operation of the vessel. The certificate of number shall be carried while operating the vessel and shall be presented for inspection to any law enforcement officer upon request. The certificate of number shall include the following information:

(1) the name of the owners, dealer, or manufacturer;

(2) the address, including zip code, of the primary owners, dealer, or manufacturers;

(3) the title indicator;

(4) the certificate of number awarded to vessel;

(5) the expiration date of the certificate of number;

(6) ~~vessel use type:~~ the primary operation of the vessel;

(A) pleasure;

(B) ~~livery;~~ rent or lease;

(C) dealer or manufacturer demonstration;

(D) commercial fishing;

(E) commercial passenger;

(F) other commercial; ~~or~~

(G) ~~other;~~ charter fishing; or

(H) other.

(7) the model of vessel, if known;

(8) the manufacturer, if known;

(9) the year of manufacture or model year, if known;

(10) the manufacturer's hull identification number, if any;

(11) the ~~overall~~ length of ~~vessel;~~ vessel in feet and inches;

(12) the type of vessel:

(A) ~~open;~~ open motorboat;

(B) ~~cabin;~~ cabin motorboat;

(C) houseboat;

(D) personal watercraft;

(E) pontoon; ~~or~~

(F) ~~other;~~ air boat;

(G) auxiliary sail;

(H) inflatable;

(I) paddlecraft/canoe;

(J) paddlecraft/kayak;

(K) rowboat;

(L) sail only; or

(M) other.

(13) the hull material:

(A) wood;

(B) ~~metal;~~ aluminum;

(C) ~~fiberglass;~~ steel;

(D) ~~plastic;~~ fiberglass;

(E) ~~inflatable; or~~ rubber/vinyl/canvas;

(F) ~~other;~~ plastic; or

(G) other.

(14) the type of ~~Propulsion:~~ propulsion:

(A) ~~inboard;~~ propeller;

(B) ~~outboard;~~ sail;

(C) ~~inboard outdrive;~~ water jet;

(D) ~~sail;~~ manual;

(E) ~~auxiliary sail with inboard;~~ air thrust; or

(F) ~~auxiliary sail with outboard;~~ other.

~~(G) jet drive;~~

(15) the type of fuel:

(A) gasoline;

(B) diesel;

(C) electric; or

(D) ~~other;~~ other.

(16) the engine drive type:

(A) inboard;

(B) outboard;

(C) stern drive;

(D) pod drive;

(E) other; or

(F) none.

~~(16)~~ (17) a notice to owner that he shall report within 30 days changes of address or ownership, and destruction or abandonment of vessel;

~~(17)~~ (18) the signature of the owners; and

~~(18)~~ (19) a notice to the owner that the operator shall:

(A) always carry this certificate on vessel when in use;

(B) report any accident involving injury or death to persons or property damage in excess of two thousand dollars ($2,000.00); and

(C) stop and render assistance if involved in boating accident.

(b) Dealers and Manufacturers. A dealer or manufacturer demonstrating or testing a vessel may use a set of dealer numbers and the corresponding dealer certificate of number to operate a vessel held for sale, but only for demonstration or testing purposes. Vessels owned or possessed by dealers or manufacturers for personal use or for any use other than for demonstration and testing purposes shall be individually registered in the name of the dealer in accordance with Paragraph (a) of this Rule.

(c) Government agency. There shall be no title indicator or expiration date listed for permanent certificate of numbers.

(d) Vessel Agents. Vessel dealers, manufacturers, and other businesses that operate from locations within North Carolina may be appointed as vessel agents of the Commission and be authorized to issue temporary certificates of number for new registrations, transfers of ownership, renewals, and duplicate transactions. All official certificates of number shall be processed and mailed from the Commission headquarters. Rules governing the appointment and operations of vessel agents are contained in 15A NCAC 10G .0400 WILDLIFE SERVICE AGENTS.

15A NCAC 10F .0109 TEMPORARY CERTIFICATE OF NUMBER

(a) When a vessel agent processes the final transaction to issue, renew, or transfer a certificate of number or to issue a duplicate certificate of number, the new owner shall be issued a temporary certificate of number. For a period not exceeding 60 days following the date of the transaction, the vessel may be operated with the temporary certificate of number.

(b) The temporary certificate of number shall contain the following:

(1) the name of issuing wildlife service agent;

(2) the name and address of the owners, dealer, or manufacturer;

(3) the title indicator;

(4) the certificate of number;

(5) the ~~vessel use type:~~ primary operation of the vessel:

(A) pleasure;

(B) ~~livery;~~ rent or lease;

(C) dealer or ~~manufacturer;~~ manufacturer demonstration;

(D) ~~permanent;~~ commercial fishing;

(E) commercial ~~fishing;~~ passenger;

(F) ~~commercial passenger;~~ other commercial;

(G) ~~other commercial;~~ charter fishing; or

(H) ~~other;~~ other.

(6) the model of ~~vessel;~~ the vessel, if known;

(7) the ~~manufacturer;~~ manufacturer, if known;

(8) the year of manufacture or model ~~year;~~ year, if known;

(9) the manufacturer's hull identification ~~number;~~ number, if any;

(10) the length of ~~vessel;~~ vessel in feet and inches;

(11) the type of vessel:

(A) ~~open;~~ open motorboat;

(B) ~~cabin;~~ cabin motorboat;

(C) houseboat;

(D) personal watercraft;

(E) pontoon; ~~or~~

(F) ~~other;~~ air boat;

(G) auxiliary sail;

(H) inflatable;

(I) paddlecraft/canoe;

(J) paddlecraft/kayak;

(K) rowboat;

(L) sail only; or

(M) other.

(12) the hull material:

(A) wood;

(B) ~~metal;~~ aluminum;

(C) ~~fiberglass;~~ steel;

(D) ~~plastic;~~ fiberglass;

(E) ~~inflatable; or~~ rubber/vinyl/canvas;

(F) ~~other;~~ plastic; or

(G) other.

(13) the type of propulsion:

(A) ~~inboard;~~ propeller;

(B) ~~outboard;~~ sail;

(C) ~~inboard outdrive;~~ water jet;

(D) ~~sail;~~ manual;

(E) ~~auxiliary sail with inboard;~~ air thrust; or

(F) ~~auxiliary sail with outboard; or~~ other.

~~(G) jet drive;~~

(14) the type of fuel:

(A) gasoline;

(B) diesel;

(C) electric; or

(D) ~~other;~~ other.

(15) the engine drive type:

(A) inboard;

(B) outboard;

(C) stern drive;

(D) pod drive;

(E) other; or

(F) none.

~~(15)~~ (16)the date the temporary certificate of number is issued;

(16) (17)the date the temporary certificate of number expires;

~~(17)~~ (18)the type of transaction pending; and

~~(18)~~ (19)the signature of the owners.

EXHIBIT H-1
July 13, 2023

Proposed Permanent Chronic Wasting Disease Rules
Recommended by Agency Staff for Public Notice, Comment, and Presentation at Public Hearing

The rules in this Section are necessary to regulate activities that aid in the transmission of chronic wasting disease (CWD), to assist with detection and isolation of the disease. Requirements will apply to areas surrounding the CWD detection to reduce movement and infection opportunities.

15A NCAC 10B .0501
Clarifies applicability of rules in the Section and defines CWD-related terms.
15A NCAC 10H .0501 Definitions and General Requirements (page 2)

15A NCAC 10B .0503
Specifies activities prohibited in Surveillance Areas, including:
- Placement of minerals, bait, and food;
- Exportation of cervids, cervid carcasses or carcass parts with exceptions;
- White-tailed deer fawn rehabilitation and transportation; and
- Possession and use of certain substances used to take, attract, or scout wildlife.

15A NCAC 10B .0503 Surveillance Area (page 4)

15A NCAC 10B .0501 DEFINITIONS AND GENERAL REQUIREMENTS

(a) The rules in this Section apply to an area of the State where Chronic Wasting Disease (CWD) has been detected, as determined by the Commission.

(b) The following definitions shall apply to rules in this Section:

(1) "Cervid" means the animals in the Family Cervidae not otherwise regulated by the NC Department of Agriculture and Consumer Services.

(2) "Cervid Health Cooperator" means an individual authorized to collect CWD samples on behalf of the Commission.

(3) "Chronic Wasting Disease" or "CWD" means the transmissible spongiform encephalopathy prion disease affecting species within the deer (Cervidae) Family.

(4) "CWD Management Area" means the area delineated by the Commission where CWD has been determined to be endemic and the rules of this Section apply.

(5) "Primary Surveillance Area" or "PSA" means a county delineated by the Commission for CWD surveillance where a confirmed CWD positive cervid has been found.

(6) "Sample" means the cervid head and no less than three inches of the neck.

(7) "Secondary Surveillance Area" or "SSA" means a county adjacent to or near a PSA delineated by the Commission for CWD surveillance.

(8) “Submit” means to deliver a sample to a cervid health cooperator or qualified Commission employee or deposit in a Commission CWD Testing Drop-off Station.

(9) "Surveillance Area" means the PSA and SSA collectively.

History Note: *Authority G.S. 113-134; 113-306;*
Temporary Adoption Eff. July 1, 2023.

15A NCAC 10B .0503 SURVEILLANCE AREA

(a) Inside a surveillance area, placement of minerals or salt licks to purposefully congregate wildlife shall be prohibited. Placement of bait, food, or food product to purposefully congregate wildlife shall be prohibited from January 2 through August 31 inside a Surveillance Area, except that bird feeders specifically designed for nongame birds and other activities specifically permitted by the Commission shall be allowed. Placement of bait, food, or food products to hunt during the urban archery season shall be allowed within the established season in participating municipalities.

(b) White-tailed deer fawn rehabilitation is prohibited in a Surveillance Area.

(c) White-tailed deer fawns originating from within a Surveillance Area shall not be transported outside the Surveillance Area.

(d) No cervid carcass or carcass parts originating from inside a Primary Surveillance Area or Secondary Surveillance Area shall be transported outside of the county of origin, except:

(1) meat that has been boned out so that no pieces or fragments of bone remain;

(2) caped hides with no part of the skull or spinal column attached;

(3) antlers, antlers attached to cleaned skull plates, or skulls free from meat or brain tissue;

(4) cleaned lower jawbones with teeth or cleaned teeth;

(5) finished taxidermy products and tanned hides; and

(6) carcass or carcass parts permitted by the Commission for disposal outside of the Surveillance Area.

(7) carcass or carcass parts originating inside a PSA may be transported into contiguous PSA(s) or outside of the PSA as specified in Subparagraphs (d)(1) through (6) of this Rule; and

(8) carcass or carcass parts originating inside a SSA may be transported into contiguous SSA(s) or PSA(s) or outside of the SSA as specified in Subparagraphs (d)(1) through (6) of this Rule.

(e) No person shall possess or use a substance or material that contains or is labeled as containing any excretion collected from a cervid, including feces, urine, blood, gland oil, or other bodily fluid for the purposes of taking or attempting to take, attracting, or scouting wildlife inside a surveillance area. This prohibition shall not apply to the following substances:

(1) products labeled as containing synthetic analogs of cervid excretions;

(2) natural substances labeled as being collected from facilities within North Carolina that have a valid Farmed Cervid License from the North Carolina Department of Agriculture and Services;

(3) natural deer urine products labeled as containing excretions from facilities within North Carolina that have a valid Farmed Cervid License from the North Carolina Department of Agriculture and Consumer Services; and

(4) natural deer urine products labeled as containing excretions from facilities that meet all the following requirements:

(A) determined to be free of chronic wasting disease (CWD) based on testing by an independent laboratory using a method that may help detect the presence of CWD prions;

(B) complies with a federally approved CWD herd certification program and any federal CWD protocols; and

(C) participates in additional herd management requirements as specified by the Wildlife Resources Commission.

History Note: *Authority G.S. 113-134; 113-306;*
Temporary Adoption Eff. July 1, 2023.

EXHIBIT H-2

July 13, 2023

Fiscal Note for Chronic Wasting Disease Rules

Rules: 15A NCAC 10B .0501 Definitions and General Requirements
15A NCAC 10B .0502 CWD Surveillance Areas Defined
15A NCAC 10B .0503 Surveillance Area
15A NCAC 10B .0504 Primary Surveillance Areas
15A NCAC 10B .0505 Secondary Surveillance Areas

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Impact: State Government: Yes
Local Government: Yes
Private Impact: Yes
Substantial Economic Impact: Possible

Authority: G.S. 113-134; 113-306

BACKGROUND

The wildlife resources of the State belong to the people of the State, including the enjoyment of these resources (G.S. 113-131(a)). The North Carolina Wildlife Resources Commission (hereinafter NCWRC, Commission, or agency) is tasked with the conservation of wildlife resources of the State (G.S. 143-239).

This responsibility includes managing as equitably as possible the various competing interests regarding these resources, including the use and take of such resources (G.S. 113-131.1(a)). The statutes governing wildlife resources are found in Chapter 113, Subchapter IV of the General Statutes, and the NCWRC has been granted rulemaking authority to implement the provisions of these statutes (G.S. 113-134). In accordance with the supply of wildlife and other factors it determines to be of public importance, the NCWRC may fix seasons and bag limits upon the

wild animals and wild birds authorized to be taken that it deems necessary or desirable in the interests of the conservation of wildlife resources (G.S. 113.291.2(a)).

Chronic Wasting Disease (CWD) is a transmissible, always fatal, neurological disease that affects deer and other cervids such as elk, moose, and reindeer/caribou. It takes several decades for population effects of CWD to become noticeable. During this time the prevalence of the disease (percentage of the population that is infected) slowly increases. As disease prevalence rises, the average life span of deer slowly declines because more deer are becoming infected and dying at a younger age because of CWD. Over time, CWD causes a decline in the population because does die at younger ages with less opportunity to reproduce.

The NCWRC has been testing for CWD since 1999 and has tested over 39,000 deer. CWD was detected in North Carolina in March 2022 in Yadkin County then subsequently in Surry, Stokes, Wilkes, and Cumberland Counties. North Carolina currently has detected eleven positive cases as of March 15, 2023.

Currently, routine statewide surveillance occurs each year. Samples are collected from a variety of sources including vehicle-kills, voluntary hunter submissions and those supplied from cooperating taxidermists and meat processors. Additionally, more intensive surveillance is conducted in areas where CWD has been found.

An emergency response plan was initiated by emergency powers of the NCWRC Executive Director on April 12, 2022. Subsequently, and in accordance with G.S. 113-306, temporary rules were adopted to replace the emergency powers. The proposed permanent rules will replace two of the temporary rules that do not change with new detections of the disease. The other temporary rules are more adaptive and will remain temporary until additional index locations have been identified or the agency no longer has the ability to manage adaptively due to resource constraints.

TEMPORARY RULES – NOT PROPOSED FOR PERMANENT ADOPTION AT THIS TIME

The following rules are being implemented as temporary rules. These rules are not part of the proposed permanent rulemaking package, but are included here to provide context for the proposed permanent rules and because they are a critical part of the state's response to CWD.

15A NCAC 10B .0502 CWD Surveillance Areas Defined - TEMPORARY

This temporary rule establishes and defines the Primary and Secondary CWD Surveillance Areas by County. Primary Surveillance Areas (PSAs) have had confirmed CWD infected deer within the counties. Secondary Surveillance Areas (SSAs) are counties around PSAs. Restrictions to control the spread of CWD and continue delineation of the disease area are based on the PSA and SSA designations.

15A NCAC 10B .0504 Primary Surveillance Areas - TEMPORARY

This temporary rule specifies mandatory testing dates and requirements for sample submission in the PSAs. Mandatory sampling in the PSAs is necessary to determine the extent of the disease in those counties, and dates within the season have been specified for sample submission to ensure the agency obtains adequate samples to make the determination.

15A NCAC 10B .0505 Secondary Surveillance Areas - TEMPORARY

This temporary rule specifies mandatory testing dates and requirements for sample submission in the SSA counties. Mandatory sampling in the SSAs is necessary to determine the presence and extent of the disease in those counties, and dates within the season have been specified for sample submission to ensure the agency obtains adequate samples to make the determination.

PROPOSED PERMANENT RULES

The following rules are proposed for permanent adoption to replace the equivalent temporary rules already in effect.

15A NCAC 10B .0501 Definitions and General Requirements

This proposed permanent rule establishes definitions that apply to any area of the state where CWD has been detected.

15A NCAC 10B .0503 Surveillance Area

To determine the extent of CWD in a given location, the agency designates surveillance areas around a confirmed detection of the disease. Collectively, PSAs and SSAs are called Surveillance Areas, or SAs.

This proposed permanent rule restricts activities within the PSAs and SSAs, including placement of bait and food outside of deer season; export of live and harvested cervids, except for the carcass parts with lower risk of spreading the disease; fawn rehabilitation; and use of certain cervid excretions used to take, attract, or scout wildlife. Cervid carcass and carcass part transport restrictions outside of the PSAs and SSAs are also specified in this proposed rule to limit potential movement of CWD from counties already known to have the disease. These restrictions are proposed in both the PSAs and SSAs because these activities have greater transmission risks associated with them. Prohibition of these activities, with few exceptions, will help the agency determine the extent and control the spread of CWD.

IMPACT ANALYSIS

This analysis considers the costs and benefits of the proposed permanent rules and the existing temporary rules collectively since their implementation is inextricably linked. Considering the impacts of all the rules together also provides a more complete picture of the potential economic impacts of the state's CWD response.

COSTS

State Government

The NCWRC pays for the costs associated with sampling and testing deer for CWD. Harvested deer are sampled by removing both medial retropharyngeal lymph nodes, which are sent to a laboratory for testing. The cost for testing lymph nodes is $40 for each set of two samples and $35 for individual samples. The agency tested 4,857 deer in the one SA (3 county, 5 partial county area) during the mandatory testing period of the 2022-2023 season at a cost of $97,155 [(4,856 samples/2 samples per set = 2,428 sample sets) (2,428 sample sets x $40 per set = $97,120 + $35/ one sample = $97,155)]. For the 2023-2024season, there will be at least five PSA counties and 13 SSA counties. Based on anticipated harvest during the mandatory testing period in the temporary rules, and assuming 100% compliance, the agency expects to sample at least 11,000 individual cervids across the SAs. This level of sampling would cost the agency approximately $220,000 [(11,000 samples/2 samples per set = 5,500 sets) (5,500 sets x $40 per set = $220,000)] depending on the actual number of samples pulled and submitted. The sampling cost will be recurring each year, but is subject to change depending on new CWD detections. Based on the additional detections from the previous season, it is likely that total sampling costs will increase in subsequent years. However, the agency does not know how many additional areas will be designated as SAs, or where they will be located. As such, costs beyond this coming season could not be reasonably projected. Eventually, the funds spent on sampling will likely be limited by availability of staff to perform the work.

Hunters do not remove lymph nodes from harvested deer for CWD testing. Agency staff and Cervid Health Cooperators (taxidermists and meat processors) conduct all sampling. To accomplish this, the agency hires temporary staff to work at check stations (locations where successful hunters take their deer to be sampled by NCWRC staff) in the PSA and SSA counties. During the 2022-2023 season, the agency hired 9 full-time temporary staff to work the 2-month season and assist with mandatory testing. This cost the agency $60,480 [($21/hr x 40 hrs = $840/week) ($840/week x 8 weeks x 9 staff = $60,480)]. For the upcoming season, the agency expects to hire15 full-time temporary staff to assist with mandatory testing and sample submission at a cost of approximately $100,800[($21/hr x 40 hrs = $840/week) ($840/week x 8 weeks x 15 staff = $100,800)]. This cost will likely be recurring each year but, is subject to change depending on future sampling needs. The number of individuals the agency is able to hire to perform this work is also likely to be limited by ability to find employees and temporary staff costs.

Agency staff drove approximately 500 miles/week, at a cost of approximately $6,210 (500 mi/wk x 3 wks = 1,500 mi x .46/mi = $690 x 9 staff = $6,210), for mandatory CWD testing related travel during the 2022-2023 season. Mileage is expected to increase to at least $6,900 (500 miles/wk x 2 wks = 1,000 miles x .46/mi = $460 x 15 staff = $6,900) for next season based on SA locations. The cost of mileage is likely to increase in subsequent years. Eventually, the funds spent on mileage will likely be limited by availability of staff to perform the work.

To help facilitate sampling, the NCWRC is building two CWD necropsy facilities, one in each of two known SAs. These facilities will be located at existing depots and will be used for CWD sampling. Each facility is estimated to cost $150,000, for a total of $300,000.

To encourage CWD testing and make it as easy as possible for hunters, the agency has partnered with Cervid Health Cooperators. The agency pays cooperators $10/head or $15/lymph node to sample deer that are brought to them. During the SA mandatory sampling period of the 2022-2023 season, the agency received 1,356 samples from cooperators at a cost of $13,560 (1,356 x $10 = $13,560) and 1,646 lymph node samples at a cost of $24,690 (1,646 x $15 = $24,690). Based on this information, the agency expects that up to half of the total CWD samples in a SA mandatory sampling periods are anticipated to come from cooperators next season. Thus, the agency estimates approximately $55,000 to $82,500 will be spent on cooperator samples [(5,500 samples x $10/head = $55,000) (5,500 samples x $15/lymph node = $82,500)]. However, the actual costs will depend on how many samples are submitted by paid cooperators, as well as whether they take head versus lymph node samples. This cost will be recurring each year at some level in the SAs because of transportation restrictions in proposed permanent rule 10B .0503.

The agency has already incurred one-time costs of $199,516 for equipment required for mandatory CWD sampling and testing in the SA for the 2022-2023 season. Because they were incurred under the temporary rule (which cannot be considered the baseline), they are still considered impacts for purposes of this analysis.

- 25 freezers at $385 each = $9,625
- 1 mobile trailer cooler = $89,891
- 1 incinerator = $50,000
- Miscellaneous lab supplies = $50,000

Additional equipment costs of at least $206,505 are anticipated before or during the 2023-2024 season because of the new CWD detections resulting in the expansion of SAs.

- 25 freezers at $385 each = $9,625
- 8 freezers at $735 each = $5,880
- 1 mobile trailer cooler = $91,000
- 1 incinerator = $50,000
- Miscellaneous lab supplies = $50,000

Local Government

The potential exists when CWD is detected, that deer hunters will no longer want to hunt in a CWD positive area not only because of the disease itself, but possibly because of the restrictions in the SAs. A decrease in the number of hunters could result in decreased tax revenues to local governments in and around the affected areas. To date, there have been some signs that this may be the case, as there was a 23% decrease in total deer harvest last season in the SA. However, there is not adequate data to conclude a trend at this point. Additionally, states that have detected CWD typically see an initial decrease in hunting effort the first season post- detection (down about 2% state-wide), but a return to normal effort soon thereafter. If a long-term decrease in harvest were to occur, it would likely be a result of factors associated with the disease itself (i.e., reduced deer population, concerns around consuming the meat, etc.) and not the result of the proposed rules.

Private

If there is a decrease in the number of hunters, this could result in decreased revenue to the businesses those hunters frequent, such as restaurants, gas stations, sporting goods stores, and convenience stores. Additionally, the proposed prohibition on use of mineral or salt licks, bait, food, and food products outside of the hunting season may impact purchases at some stores that sell these items. Though the agency did see an approximately 23% decrease in total deer harvest last season in the SA, based on the experiences of other CWD-positive states, this is not likely to continue. Additionally, there are not adequate data to conclude that this decrease was due to the disease, thus, this potential impact cannot be confirmed at this point.

Individuals who hunt in the SAs and have taken their carcass and/or carcass parts outside of SA counties for processing or taxidermy will no longer be able to unless those carcasses are boned out or cleaned to remove high-risk parts, or they have authorization from the Commission. The proposed restrictions on carcass transport outside of the SAs could decrease the business of taxidermists and processors outside of those counties. This has the potential to affect at least 35 licensed taxidermists that are located in close proximity to current SA boundaries, and nine processors that the agency knows of because they are Cervid Health Cooperators (processors are not regulated by the NCWRC). Unfortunately, the agency has no way to estimate the potential impacts.

Though no licensed fawn rehabilitators are currently located in SA counties at this time, the proposed restrictions on fawn rehabilitation in this rule would prohibit the activity in the future. While the agency does not anticipate this being an issue, it could be considered an opportunity cost. Some opportunity costs may also be realized by hunters in SAs, like a potential decrease in harvest, the agency has made a concerted effort to keep monetary costs close to nil. While some behaviors and practices may need to change, like using a different taxidermist or processor inside a SA or disposing of the carcass by burying it on the property where harvested (rather than transporting the carcass outside a SA) or in a landfill, no net costs should be realized for these activities.

BENEFITS

The goal of the CWD rules as a whole is to identify the prevalence and reduce human assisted movement of the disease. This is accomplished through state-wide surveillance and targeted monitoring of disease prevalence within the cervid population in and around areas where CWD has been identified. Requiring testing of harvested deer in the PSAs and SSAs helps the agency identify where CWD exists, the extent to which it exists, and where it may spread geographically. It is also the most effective and efficient use of agency resources (time and money) to understand CWD - a concentrated effort to maximize the number of samples collected in a short period of time. The more harvested deer that are tested, the better the agency's data on the severity of the disease. By requiring testing and limiting transportation of deer, deer carcasses and parts, CWD is more likely to remain contained in the area identified for a longer period of time, less impacting hunting statewide. More specifically, the two proposed permanent rules provide context and consistency in CWD terminology as they interact with the existing and adapting temporary rules.

Benefits of the proposed rules will likely be limited in the near term as hunters become accustomed to the new requirements in the SAs. The most likely near-term benefit will be to taxidermists (39) and processors (12) in the SAs that may see an increase in their business because of proposed transportation restrictions in the PSAs and SSAs.

It is the agency's hope that identifying and potentially containing the distribution of CWD within the NC deer herd will have significant long-term benefits to hunters, local businesses, wildlife conservation, and the North Carolina economy. If the CWD interventions are successful, the bulk of the benefits will be realized over the course of many years, increasing as the WRC's understanding of the prevalence of the disease increases.

According to annual hunter harvest surveys, deer remain the most hunted species in North Carolina. Eighty-one percent of licensed hunters (241,619) hunt deer. Eighty percent of NC resident hunters (238,478) hunt deer. These individuals contribute over $731M to the economy annually.[1]

Though the NCWRC does not have data on how many hunting trips are made to the SAs specifically, Northwestern NC is known to be popular with deer hunters and Southeastern NC provides hunting opportunities for many local residents. By avoiding losses to local business visitation and sales, the state and local governments will likely also avoid losses to their tax revenue from the economic activity generated by the deer hunting.

Licensed hunters provide a significant portion of funding to the agency, not only through the license fees themselves, but also the matching federal funding dollars from the U.S. Fish and Wildlife Service based on license sales. Maintaining the NC deer herd will help avoid potential losses to this source of conservation funding.

ALTERNATIVES

Although the benefits could not be quantified, it is possible that the total impact (costs + benefits) of the proposed rules could be substantial (greater than $1 million) in a given year. As such, alternatives to the rules as proposed were considered in compliance with G.S. 150B-21.4.

Option 1
Because management of CWD requires an understanding of distribution and prevalence of the disease, the agency could require mandatory sampling statewide now that CWD has been detected in more than one geographic area. However, sampling is costly and this option would result in more samples than the agency could collect, process or pay for. Additionally, voluntary CWD sampling outside of SAs generates adequate data to manage the deer herd and the disease. Therefore, the agency is not proposing the option of mandatory state-wide sampling.

Option 2
The agency has CWD surveillance goals designed to understand prevalence and spread of the disease. As stewards of the resource, it's important for the agency to appropriately manage the deer herd and keep the public informed about issues that could impact them.

[1] North Carolina Wildlife Resources Commission. 2023. North Carolina Outdoor Experiences Survey.

Prior to NC becoming CWD positive, the agency offered voluntary testing statewide. At that time, most samples came from Cervid Health Cooperators throughout the season and staff check stations at cooperator locations the opening weekend of gun season. While this method was appropriate at the time, it would require expending a lot of resources to reach surveillance goals now that the state is CWD positive.

During the 2021-2022 season, 7,369 deer (approximately 18% of total harvest) state-wide were tested for CWD. While the number of samples would likely increase even if testing were voluntary, this way of collecting samples is much less efficient from a data gathering standpoint (cost per sample) than targeted mandatory sampling and would take longer to reach surveillance goals. For these reasons, the option of statewide voluntary testing was not selected.

SUMMARY

Quantifiable Impacts

State

The following one-time quantifiable costs associated with mandatory CWD sampling and testing were incurred for the 2022-2023 deer season under temporary rules (not considered part of the regulatory baseline):

- Mandatory testing = $97,155
- Temporary employees = $60,480
- Mileage = $6,210
- Cervid Health Cooperator payments = $38,250
- Sampling supplies = $199,516

TOTAL = $401,611

The following one-time quantifiable costs associated with CWD sampling and testing are anticipated to occur before or during the 2023-2024 deer season.

- Necropsy Facilities = $300,000
- Supplies = $206,505

The following quantifiable future annual costs associated with CWD sampling and testing are anticipated from the proposed permanent CWD rules before, during, and after the 2023-2024 season:

- Mandatory testing ($40 per set of 2 samples) = $220,000
- Temporary employees ($6,720 per employee for 2-months) = $100,800
- Mileage ($0.46 per mile) = $6,900
- Cervid Health Cooperator payments = $55,000 - $82,500

TOTAL = $382,700 - $410,200

The State costs broken down by deer season are summarized in Table 1. It is important to note that for future costs, including 2023-2024, these are estimates based on currently available data and the State is still in the phase of disease discovery. Costs for testing, temporary staff, mileage, cooperators, and supplies may be higher in the near future if CWD is detected in new areas. However, a more intensive monitoring effort (expending more resources) in the near term will result in less expenditures long term. Getting to the point of disease maintenance will help the agency relax sampling requirements and restrictions on the public (movement, transportation, rehabilitation).

The agency expects several additional seasons to reach surveillance goals and understand the prevalence and spread of the disease. After this point, sampling will likely go back to voluntary. However, regardless of the sampling and testing requirements, the total costs in any given year are most likely to be limited by staff capacity.

Table 1: Summary of Estimated Costs to the State by Deer Season

	Yr 22-23*	**Yr 23-24**	**Yr 24-25**	**Yr 25-26**	**Yr 26-27**	**Yr 27-28**	**Yr 23-28 5-year NPV, 7% discount**
Testing	$97,155	$220,000	$220,000	$220,000	$220,000	$220,000	
Temp Staff	$60,480	$100,800	$100,800	$100,800	$100,800	$100,800	
Mileage	$6,210	$6,900	$6,900	$6,900	$6,900	$6,900	
Cooperators (low)	$38,250	$55,000	$55,000	$55,000	$55,000	$55,000	
Cooperators (high)	$38,250	$82,500	$82,500	$82,500	$82,500	$82,500	
Supplies	$199,516	$206,505	$100,000	$75,000	$50,000	$50,000	
Necropsy facilities	$0	$300,000	$0	$0	$0	$0	
Total Estimated Costs in $2022(Low)	$401,611	$889,205	$482,700	$457,700	$432,700	$432,700	**$2,264,875**
State Portion (Low)	$100,403	$222,301	$120,675	$114,425	$108,175	$108,175	**$566,219**
Total Estimated Costs in $2022 (High)	$401,611	$916,705	$510,200	$485,200	$460,200	$460,200	**$2,377,630**
State Portion (High)	$100,403	$229,176	$127,550	$121,300	$115,050	$115,050	**$594,408**

**Yr 22-23 costs have already been incurred and are not included in the 5-year NPV calculations.*

Seventy-five percent of all CWD related costs, including staff time, supplies, sampling, and facilities are paid for with U.S. Fish & Wildlife Service grants. Thus, the agency only uses State funds to cover 25% of costs associated with these items. The adjusted quantifiable State costs associated with the proposed CWD rules are estimated at $100,403 for the 2022-2023 season, $222,301 - $229,176 for the 2023-2024 season, and $108,175 - $127,550 for each year thereafter.

Unquantifiable Impacts

State

The following unquantifiable benefits are anticipated from the proposed CWD rules:

- Better understanding of disease distribution and necessary long-term requirements within and around CWD detections.
- Improved containment of the disease.
- Significant avoided losses to the state economy from deer hunters. This includes avoided losses from hunting license sales, tax revenue, and jobs-related income, benefits that will be realized over the long term. The magnitude of this benefit is highly uncertain and will depend on compliance of the hunting community and how successful the proposed measures are at containing the spread of CWD.

Local

The following unquantifiable costs are anticipated from the proposed CWD rules:

- Decreased business for processors and taxidermists just outside of the SAs because of transport restrictions.
- Decreased tax revenues to local governments in and around the SAs if hunters choose to hunt elsewhere.

The following unquantifiable benefits are anticipated from the proposed CWD rules:

- Increased business for taxidermists and processors inside the SAs.
- Significant avoided losses to the local economy from the revenue generated by deer hunting. This includes avoided losses from spending on lodging, restaurant, and gear. These benefits will be realized long term. The magnitude of this benefit will depend on compliance of the hunting community and how successful the proposed measures are at containing the spread of CWD.

Private

The following unquantifiable costs are anticipated from the proposed CWD rules:

- A decrease in the number of hunters could result in decreased revenue to the businesses those hunters frequent, such as restaurants, gas stations, sporting goods stores, and convenience stores.
- Decreased business to taxidermists and processors located just outside of the SA boundaries.
- Lost opportunity for fawn rehabilitation in SA counties.

If the CWD interventions are successful, the long-term benefits of slowing the spread of CWD in the SAs are likely to be significant. Although the long-term benefits are highly uncertain and could not be quantified, if successful, the benefits are likely to exceed the costs associated with increased surveillance and carcass transport requirements. If no action is taken, this could potentially

contribute to significant losses to the cervid population and harm to local and state economies which benefit from significant revenues generated by NC hunting.

SECTION .0500 – CHRONIC WASTING DISEASE MANAGEMENT

15A NCAC 10B .0501 DEFINITIONS AND GENERAL REQUIREMENTS

(a) The rules in this Section apply to any area of the State where Chronic Wasting Disease (CWD) has been detected, as determined by the Commission.

(b) The following definitions shall apply to rules in this Section:

(1) "Cervid" means all animals in the Family Cervidae not otherwise regulated by the NC Department of Agriculture and Consumer Services.

(2) "Cervid Health Cooperator" means an individual authorized to collect CWD samples on behalf of the Commission.

(3) "Chronic Wasting Disease" or "CWD" means the transmissible spongiform encephalopathy prion disease affecting species within the deer (Cervidae) Family.

(4) "CWD Management Area" means the area delineated by the Commission where CWD has been determined to be endemic and the rules of this Section apply.

(5) "Primary Surveillance Area" or "PSA" means a county delineated by the Commission for CWD surveillance where a confirmed CWD positive deer has been found.

(6) "Sample" means the cervid head and at least three inches of the neck.

(7) "Secondary Surveillance Area" or "SSA" means an area around a PSA delineated by the Commission for CWD surveillance.

(8) “Submit” means to deliver a sample to a Commission staffed facilty, cervid health cooperator, or qualified Commission employee or deposit in a Commission CWD Testing Drop-off Station.

(9) "Surveillance Area" means the PSA and SSA collectively.

History Note: Authority G.S. 113-134; 113-306;

15A NCAC 10B .0502 CWD SURVEILLANCE AREAS DEFINED (TEMPORARY RULE INCLUDED FOR CONTEXT ONLY – NOT PART OF CURRENT PERMANENT RULEMAKING PACKAGE)

(a) The following Counties are Primary Surveillance Areas:

(1) Cumberland County;

(2) Stokes County;

(3) Surry County;

(4) Wilkes County; and

(5) Yadkin County.

(b) The following Counties are Secondary Surveillance Areas:

(1) Alexander County:

(2) Alleghany County;

(3) Ashe County;

(4) Bladen County;

(5) Davie County;

(6) Forsyth County;

(5) Guilford County;

(7) Harnett County;

(8) Hoke County;

(9) Iredell County;

(10) Robeson County;

(11) Rockingham County; and

(12) Sampson County;

History Note: Authority G.S. 113-134; 113-306;

15A NCAC 10B .0503 SURVEILLANCE AREA

(a) Inside a surveillance area, placement of minerals or salt licks to purposefully congregate wildlife shall be prohibited. Placement of bait, food, or food product to purposefully congregate wildlife shall be prohibited from January 2 through August 31 each year inside a Surveillance Area, except that feeders specifically designed for nongame birds and other activities specifically permitted by the Commission shall be allowed. Placement of bait, food, or food products for the purpose of hunting during the urban archery season shall be allowed within the established season in participating municipalities.

(b) It is unlawful to export a live cervid, cervid carcass, or carcass parts originating from inside a Surveillance Area except:

(1) meat that has been boned out such that no pieces or fragments of bone remain;

(2) caped hides with no part of the skull or spinal column attached;

(3) antlers, antlers attached to cleaned skull plates, or skulls free from meat or brain tissue;

(4) cleaned lower jawbones with teeth or cleaned teeth;

(5) finished taxidermy products and tanned hides; and

(6) carcass or carcass parts permitted by the Commission for disposal outside of the Surveillance Area.

(c) White-tailed deer fawn rehabilitation is prohibited in a Surveillance Area.

(d) White-tailed deer fawns originating from within a Surveillance Area shall not be transported outside the Surveillance area.

(e) No person shall possess or use any substance or material that contains or is labeled as containing any excretion collected from a cervid, including feces, urine, blood, gland oil, or other bodily fluid for the purposes of taking or attempting to take, attracting, or scouting wildlife inside a surveillance area. This prohibition shall not apply to the following substances:

(1) products containing synthetic analogs of cervid excretions and labeled as such;

(2) natural substances collected from facilities within North Carolina that have a valid Farmed Cervid License from the North Carolina Department of Agriculture and Consumer Services and are labeled as such;

(3) natural deer urine products containing excretions from facilities within North Carolina that have a valid Farmed Cervid License from the North Carolina Department of Agriculture and Consumer Services and are labeled as such; and

(4) natural deer urine products containing excretions from facilities that meet all the following requirements and are labeled as such:

(A) determined to be free of chronic wasting disease (CWD) based on testing by an independent laboratory using a method that may help detect the presence of CWD prions;

(B) complies with a federally approved CWD herd certification program and any federal CWD protocols; and

(C) participates in additional herd management requirements as specified by the

Wildlife Resources Commission.

History Note: *Authority G.S. 113-134; 113-306;*

15A NCAC 10B .0504 PRIMARY SURVEILLANCE AREAS (TEMPORARY RULE INCLUDED FOR CONTEXT ONLY – NOT PART OF CURRENT PERMANENT RULEMAKING PACKAGE)

(a) Any hunter who harvests a cervid in the Stokes County, Surry County, Wilkes, or Yadkin County PSAs during the all lawful weapons season from the Saturday prior to Thanksgiving Day through the 3rd Sunday thereafter shall submit a sample to the Commission for CWD testing no later than 2 weeks following the harvest.

(b) Any hunter who harvests a cervid in the Cumberland County PSA from the Saturday 12 days prior to Thanksgiving Day through the 3rd Sunday thereafter shall submit a sample to the Commission for CWD testing no later than 2 weeks following the harvest.

(c) No cervid carcass or carcass part originating from inside a PSA shall be transported outside the PSA unless it is taken into an adjacent county that is also designated as a PSA, or the carcass parts comply with Rule .0503(b) of this Section, or as authorized by the Commission.

History Note: Authority G.S. 113-134; 113-306;

15A NCAC 10B .0505 SECONDARY SURVEILLANCE AREAS (TEMPORARY RULE INCLUDED FOR CONTEXT ONLY – NOT PART OF CURRENT PERMANENT RULEMAKING PACKAGE)

(a) Any hunter who harvests a cervid in the Alexander County, Alleghany County, Ashe County, Davie County, Forsyth County, Guilford County, Iredell County, or Rockingham County SSA from the opening day of the all lawful weapons season through the 3rd Sunday thereafter shall submit a sample to the Commission for CWD testing no later than 2 weeks following the harvest.

(b) Any hunter who harvests a cervid in the Bladen County, Harnett County, Hoke County, Robeson County, or Sampson County SSA from the Saturday prior to Thanksgiving through the 3rd Sunday thereafter shall submit a sample to the Commission for CWD testing no later than 2 weeks following the harvest.

(c) Cervid carcass and carcass parts originating from inside an SSA may be transported into an adjacent PSA.

(d) Except as provided in Rule .0503(b) of this Section, cervid carcasses or carcass parts shall not be transported outside of the SSA unless authorized by the Commission.

History Note: Authority G.S. 113-134; 113-306;

EXHIBIT I-1

July 13, 2023

Public Comments for 15A NCAC 10F .0310 Dare County

There were no public comments received during the open comment period.

One public hearing was held on May 11, 2023.

EXHIBIT I-2

July 13, 2023

FINAL ADOPTION FOR PROPOSED AMENDMENTS TO 15A NCAC 10F .0310 – DARE COUNTY

The Notice of Text for adoption of amendments to 15A NCAC 10F .0310 Dare County, at Motts Creek in the waters surrounding the Oregon Inlet U.S. Coast Guard Station, Oregon Inlet Fishing Center and Marina, and Oregon Inlet Public Boat Ramp and kayak launch area at Cape Hatteras National Seashore, and amendments to incorporate into the North Carolina Administrative Code the names and addresses of Boating Access Areas in Dare County was published in the *NC Register* with open comment period and public hearing, per the Administrative Procedure Act.

A virtual public hearing was held on May 11, 2023 with no comments received. There were no comments received during the open comment period.

Staff seeks your adoption of these proposed Rule amendments, subject to final review by the N.C. Rules Review Commission. The earliest effective date of the Rule will be September 1, 2023.

15A NCAC 10F .0310 DARE COUNTY

(a) Regulated Areas. This Rule shall apply to the following waters and portions of waters in Dare County:

(1) Manteo.

(A) the waters of Doughs Creek ~~off of~~ off Shallowbag Bay and all canals off of Shallowbag Bay.

(B) within 50 yards of the Bowsertown Boating Access Area on Croatan Sound at 35.89810 N, 75.67710 W.

(2) Hatteras.

(A) the waters of Pamlico Sound otherwise known as Hatteras Harbor and Muddy Creek bounded on the north and south by the high-water mark, on the west by a straight line between channel markers number 20 and 17 at the entrance to Hatteras Harbor, and on the east by the mouth of Muddy Creek at Sandy Bay at a point at 35.22801 N,75.68050 W; and

(B) Hatteras Ferry Terminal and United States Coast Guard basins ending at Coast Guard Beacon Number One in the Hatteras Channel.

(3) ~~Mann's~~ Manns Harbor.

(A) Old Ferry Dock Road Canal, beginning at a point at 35.90654 N, 75.76916 W.

(B) within 50 yards of the Manns Harbor Boating Access Area on Croatan Sound at 35.91020 N, 75.77150 W.

(C) within 50 yards of the Mashoes Boating Access Area on East Lake at 35.92820 N, 75.81470 W.

(4) Nags Head.

(A) the canals of Old Nags Head Cove where the canal entrance meets Roanoke Sound beginning at a point at 35.94192 N, 75.62571 W;

(B) the Roanoke Sound inlets at Pond Island on either side of W. Marina Drive extending north from U.S. Highway 64-264.

(5) Wanchese.

(A) Wanchese Harbor otherwise known as Mill Landing Creek, beginning at its entrance from Roanoke Sound at a point at 35.84006 N, 75.61726 W; and

(B) the canal from its beginning where it connects with Roanoke Sound south of the dead-end road SR 1141 otherwise known as Thicket Lump Drive, extending northwest roughly parallel to SR 1141, SR 1142 otherwise known as The Lane, and SR 1143 otherwise known as Tink Tillet Road, then westward roughly parallel to N.C. Highway 345, and finally curving to the southwest roughly parallel to SR 1289 otherwise known as C B Daniels SR Road to its end.

(6) Stumpy Point.

(A) Stumpy Point Canal shore to shore on Pamlico Sound, beginning 50 yards west of the ~~Wildlife Resources Commission boating access area.~~ Stumpy Point Boating Access Area, 321 Bayview Drive.

~~(7)~~ (B) Stumpy Point Basin off ~~of~~ Stumpy Point Bay, east of U.S. Highway 264 where it intersects Stumpy Point Bay at a point at 35.69591 N, 75.77264 W.

(7) Rodanthe. Within 50 yards of the Rodanthe Boating Access Area in Roanoke Sound, 23170 Myrna Peters Road.

(8) Town of Southern Shores. ~~Canals~~ The canals and lagoons within the Town of Southern Shores north of U.S. Highway 158.

(9) Colington Harbour. The waters in the canals of Colington Harbour Subdivision on Albemarle Sound.

(10) Kitty Hawk. The waters ~~contained~~ in the canals of Kitty Hawk Landing Subdivision.

(11) Washington Baum ~~Bridge.~~ Bridge Boating Access Area. ~~Roanoke Sound from marker 24B north of the bridge to marker 24A south of the bridge, and 50 yards east of the navigation span west to the shore as designated by the appropriate markers.~~ The waters within 150 yards north and south and

300 yards east of the Washington Baum Boating Access Area in Roanoke Sound, at 35.89380 N, 75.63710 W.

(12) Kill Devil Hills.

(A) Baum Bay Harbor, beginning at a point at 36.00572 N, 75.68105 W.

(B) the waters within 50 yards of the Avalon Beach Boating Access Area in Kitty Hawk Bay, 2025 Bay Street.

(13) Avon. The waters of Pamlico Sound shore to shore beginning at a line from a point on the east shore of Big Island at 35.36653 N, 75.50770 W westward to a point on the mainland at 35.36653 N, 75.50556 W, south to include the waters of the cove between North Albacore Lane and South Albacore Lane and the waters of Mill Creek, and ending east of a line from a point on the south shore of Big Island at 35.36500 N, 75.50820 W southward to a point on the mainland at 35.36358 N, 75.50826 W.

(14) Jean Guite Creek. The waters of Jean Guite Creek from where it meets Kitty Hawk Bay at 36.04887 N, 75.72754 W, north to a line from a point on the east shore in Southern Shores at 36.10460 N, 75.74192 W to a point on the west shore in Martin's Point Subdivision at 36.10452 N, 75.73948 W.

(15) Frisco. The waters of the marina canal and boat basin at Palmetto Shores Subdivision, shore to shore beginning at the canal's entrance at Pamlico Sound at a point at 35.25427 N, 75.60301 W.

(16) Cape Hatteras National Seashore. The waters of Motts Creek in Roanoke Sound, shore to shore at a line from a point on the north shore where the Oregon Inlet U.S. Coast Guard Station is located, to a point near the south shore of Motts Creek at 35.792070 N, 75.54903 W, then northward to include the waters at the Oregon Inlet Fishing Center and Marina, Oregon Inlet Public Boat Ramp, kayak launch area, and U. S. Coast Guard Station and Launch Area.

(b) Speed Limit. No person shall operate a vessel at greater than no-wake speed within any of the regulated areas described in Paragraph (a) of this Rule.

(c) Swimming Area. No person operating or responsible for the operation of any ~~vessel, surfboard, water skis, or jet skis~~ vessel shall permit it to enter the marked swimming area at Colington Island on the west shore, from a point where the canal enters the harbor at 36.01797 N, 75.72681 W, north 600 feet to a point at 36.01964 N, 75.72683 W and extending 300 feet west into Albemarle Sound.

(d) Placement of Markers. The following agencies ~~shall be~~ are the designated agencies for placement of markers implementing this Rule, subject to the approval of the United States Coast Guard and the United States Army Corps of Engineers:

(1) the Board of Commissioners of the Town of Manteo for the areas ~~indicated~~ designated in ~~Subparagraph (a)(1)~~ Part (a)(1)(A) of this Rule;

~~(2) the Board of Commissioners of Dare County for the areas indicated in Subparagraphs (a)(2) through (a)(7), (a)(9) and (a)(11) through (a)(15) of this Rule;~~

(2) the Board of Commissioners of Dare County for the areas designated in Paragraph (c), Subparagraphs (a)(2); (a)(4); (a)(5); (a)(8) through (10); (a)(13) through (15); and Parts (a)(3)(A); (a)(6)(B); and (a)(12)(A) of this Rule;

(3) the Board of Commissioners of the Town of Southern Shores for the areas ~~indicated~~ designated in Subparagraph (a)(8) of this Rule;~~ and~~

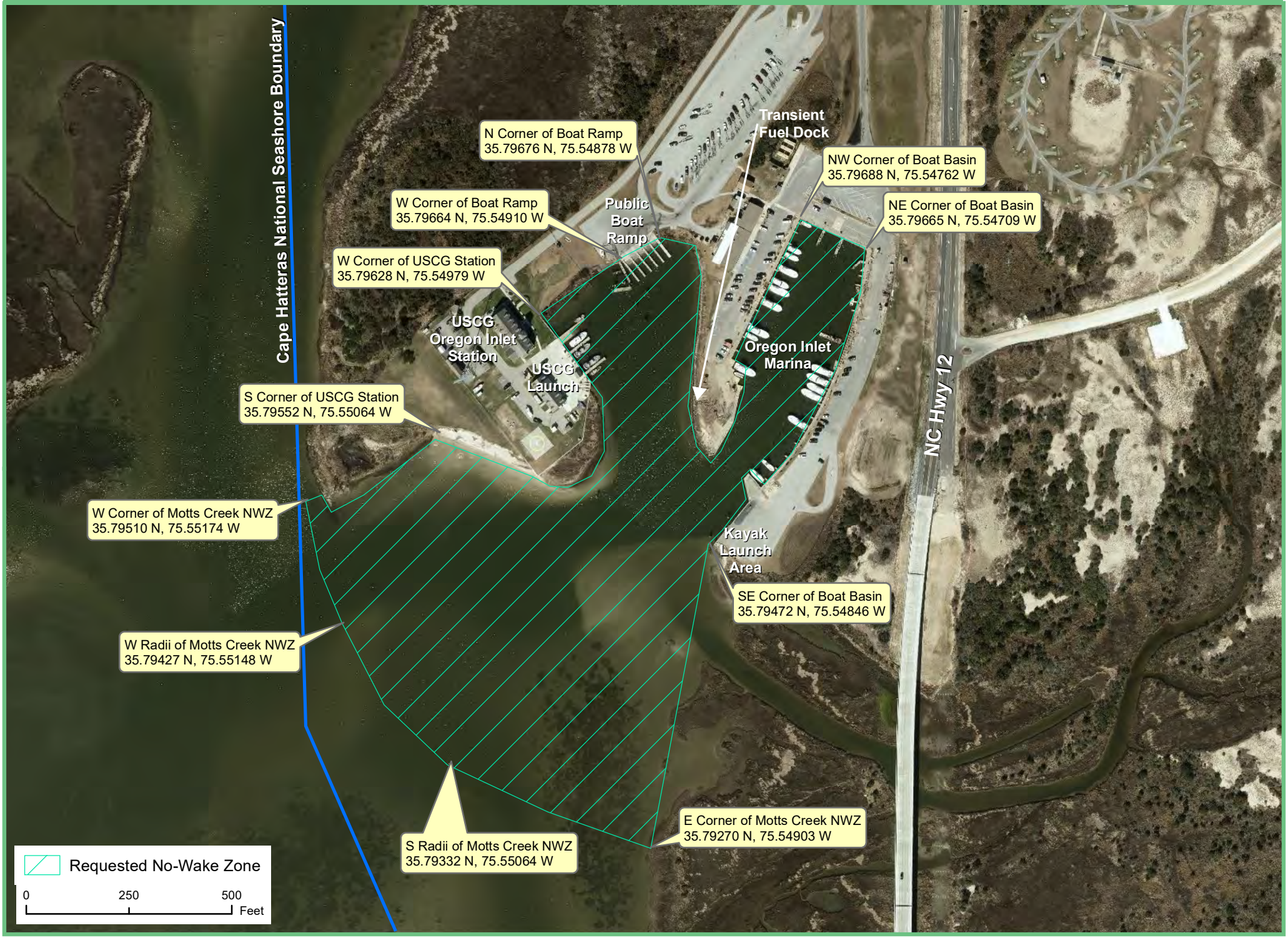
(4) the Board of Commissioners of the Town of Kitty Hawk for the area~~ indicated~~ designated in Subparagraph (a)(10) of this ~~Rule.~~ Rule;

(5) the National Park Service for the area designated in Subparagraph (a)(16) of this Rule; and

(6) the North Carolina Wildlife Resources Commission for the areas designated in Subparagraphs (a)(7) and (a)(11); and Parts (a)(1)(B); (a)(3)(B) and (C); (a)(6)(A); and (a)(12)(B) of this Rule.

History Note: *Authority G.S. 75A-3; 75A-15;*
Eff. February 1, 1976;
Amended Eff. April 1, 1997; December 1, 1994; May 1, 1994; March 1, 1993; May 1, 1988;
Temporary Amendment Eff. February 1, 1999; July 1, 1998;
Amended Eff. July 1, 2000; April 1, 1999;
Pursuant to G.S. 150B-21.3A, rule is necessary without substantive public interest Eff. December 6, 2016;
Amended Eff. September 1, 2023; October 1, 2022; October 1, 2018.

No Wake Zone Request
USCG Station, Boat Ramp and Basin, Motts Creek, Roanoke Sound, Dare County



Created by NCWRC, November 2022

EXHIBIT J-1

July 13, 2023

Public Comments for 15A NCAC 10F .0374 Cube Hydro Carolinas

There were no public comments received during the open comment period.

One public hearing was held on May 11, 2023.

EXHIBIT J-2

July 13, 2023

FINAL ADOPTION FOR PROPOSED AMENDMENTS TO 15A NCAC 10F .0374 – CUBE HYDRO CAROLINAS SAFETY ZONES AND RESTRICTED AREAS

The Notice of Text for adoption of amendments to 15A NCAC 10F .0374 to change the name of Cube Yadkin Generation to Cube Hydro Carolinas; to establish Safety Zones and restricted areas at High Rock Hydroelectric Station, Tuckertown Hydroelectric Station, Narrows Hydroelectric Station, and Falls Hydroelectric Station on the Yadkin River in Rowan, Davidson, Stanly and Montgomery counties; to prohibit swimming in restricted areas; and to prohibit discharge of a firearm within a restricted area was published in the *NC Register* with open comment period and public hearing, per the North Carolina Administrative Procedure Act.

A virtual public hearing was held on May 11, 2023, with no comments received. There were no comments received during the open comment period.

Staff seeks your adoption of these proposed Rule amendments, subject to final review by the N.C. Rules Review Commission. The earliest effective date of the Rule will be September 1, 2023.

15A NCAC 10F .0374 ~~CUBE YADKIN GENERATION~~ CUBE HYDRO CAROLINAS SAFETY ZONES AND RESTRICTED ~~ZONES~~AREAS

(a) Regulated Areas. This Rule shall apply to the ~~area one hundred feet upstream or and downstream from the stations and dams, associated structures, abutments, and equipment at the following stations:~~ following hydroelectric stations, dams, associated structures, abutments, and equipment:

~~(1) Narrows Hydroelectric Station on the Yadkin River in Stanly and Montgomery Counties;~~

~~(2) High Rock Hydroelectric Station on the Yadkin River in Rowan and Davidson Counties.~~

(1) High Rock Hydroelectric Station on the Yadkin River in Rowan and Davidson counties;

(2) Tuckertown Hydroelectric Station on the Yadkin River in Stanly and Montgomery counties;

(3) Narrows Hydroelectric Station on the Yadkin River in Stanly and Montgomery counties; and

(4) Falls Hydroelectric Station on the Yadkin River in Stanly and Montgomery counties.

(b) Safety Zones. With the exception of authorized persons and vessels, no entry shall be allowed in the waters downstream from the powerhouse, turbines, or generator discharge that mechanically propel or accelerate the flow of water at the following hydroelectric stations:

(1) High Rock Hydroelectric Station on the Yadkin River in Rowan and Davidson counties, two hundred feet downstream;

(2) Tuckertown Hydroelectric Station on the Yadkin River in Stanly and Montgomery counties, two hundred feet downstream;

(3) Narrows Hydroelectric Station on the Yadkin River in Stanly and Montgomery counties, one hundred feet directly in front of the powerhouse, turbines, or generator discharge that mechanically propel or accelerate the flow of water; and

(4) Falls Hydroelectric Station on the Yadkin River in Stanly and Montgomery counties, one hundred feet downstream.

(c) Restricted Areas. Restricted Areas shall be located 200 feet upstream and 200 feet downstream from the hydroelectric stations described in Paragraph (a) of this Rule in or upon a vessel. Individuals shall at all times wear a U.S. Coast Guard-approved personal flotation device as described in 15A NCAC 10F .0201(b)(5).

(d) Swimming. Swimming shall be prohibited in the restricted areas described in this Rule.

(e) Firearms. No person shall discharge a firearm within the restricted areas described in this Rule.

~~(b) Fishing. Except as otherwise provided in this Paragraph or in Paragraph (c) of this Rule, no person shall enter the waters within the regulated areas described in Paragraph (a) of this Rule, except persons engaged in fishing within the regulated areas described in Paragraph (a) of this Rule may enter these waters in connection with such fishing activities provided that they shall wear at all times a U.S. Coast Guard approved personal flotation device in serviceable condition and of appropriate size for the wearer.~~

~~(c) Boating. Any person in or upon a boat, raft, or other floating object that enters into the regulated areas described in Paragraph (a) of this Rule shall wear at all times a U.S. Coast Guard approved personal flotation device in serviceable condition and of appropriate size for the wearer.~~

~~(d)~~ (f) No vessel shall tie off to any part of the hydroelectric station structure or the accessory portions thereof within restricted areas described in ~~Paragraph (a) of~~ this Rule ~~or~~ nor anchor or otherwise secure a vessel in these areas.

~~(e)~~ (g) ~~Paragraph (d)~~ Paragraph (f) of this Rule shall not apply to persons who enter with consent of ~~Cube Yadkin Generation~~ Cube Hydro Carolinas for the purpose of maintaining, repairing, or evaluating facilities of ~~Cube Yadkin Generation;~~ Cube Hydro Carolinas; law enforcement or emergency personnel; or N.C. state employees acting in an official capacity.

~~(f)~~ (h) Placement and Maintenance of Markers. ~~Cube Yadkin Generation~~ Cube Hydro Carolinas shall be the designated entity for placement and maintenance of buoys and other signs implementing this Rule.

History Note: *Authority G.S. 75A-3; 75A-15;*
Eff. January 1, 2008;
Pursuant to G.S. 150B-21.3A, rule is necessary without substantive public interest Eff. December 6, 2016;
Amended Eff. September 1, 2023; October 1, 2018.

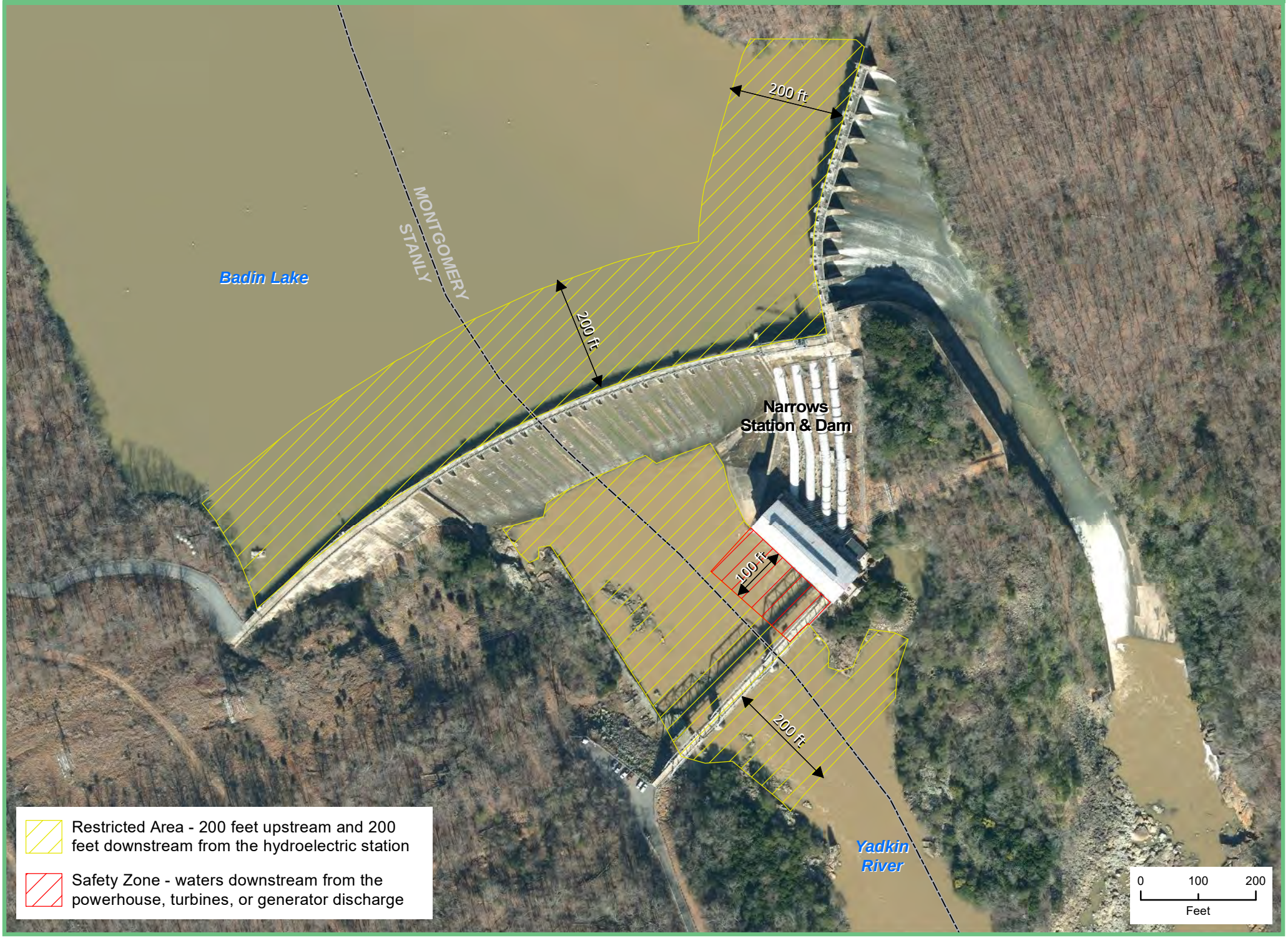
15A NCAC 10F .0374 - Cube Hydro Carolinas Safety Zone and Restricted Area
High Rock Hydroelectric Station, Davidson and Rowan Counties

Created by NCWRC, July 2022

15A NCAC 10F .0374 - Cube Hydro Carolinas Safety Zone and Restricted Area
Tuckertown Hydroelectric Station, Montgomery and Stanly Counties

Created by NCWRC, July 2022

15A NCAC 10F .0374 - Cube Hydro Carolinas Safety Zone and Restricted Area
Narrows Hydroelectric Station, Montgomery and Stanly Counties



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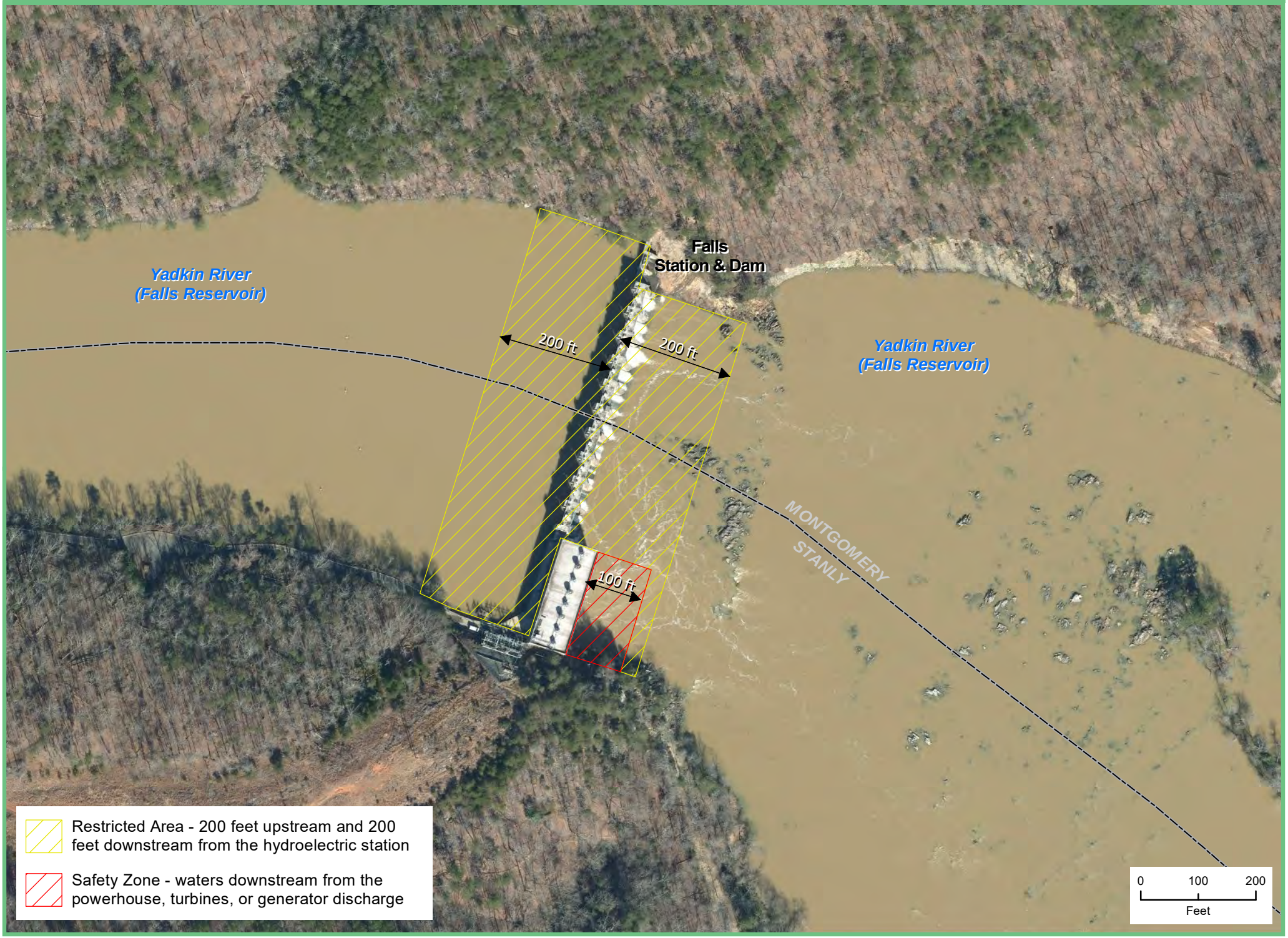
15A NCAC 10F .0374 - Cube Hydro Carolinas Safety Zone and Restricted Area
Falls Hydroelectric Station, Montgomery and Stanly Counties



Created by NCWRC, July 2022

EXHIBIT K-1

July 13, 2023

PUBLIC COMMENTS FOR 15A NCAC 10F .0305 BRUNSWICK COUNTY TOWN OF SUNSET BEACH TEMPORARY RULE

There was one public comment received during the open comment period, at the virtual public hearing held on May 23, 2023.

EXHIBIT K-2

July 13, 2023

FINAL ADOPTION OF TEMPORARY RULE FOR 15A NCAC 10F .0305 – BRUNSWICK COUNTY AT TOWN OF SUNSET BEACH

The Notice of Text for adoption of a temporary rule for 15A NCAC 10F .0305 - Brunswick County, at the Town of Sunset Beach in the waters of South Jinks Creek for the duration of Phase 2 of the Town of Sunset Beach Shallow Draft Navigation Project, located south of a line north of the feeder channel, southeast to a point on the south shore and including the waters west in the feeder channel, four finger canals, and the bay area, was published on the Office of Administrative Hearings website on May 5, 2023, with open comment period and public hearing, per the North Carolina Administrative Procedure Act.

A virtual public hearing was held on May 23,2023, with one comment in support received. There were no other comments received during the open comment period.

Staff seeks your adoption of the temporary Rule amendment for South Jinks Creek in the Town of Sunset Beach, subject to review by the N.C. Rules Review Commission. The earliest effective date of the temporary Rule will be August 15, 2023.

15A NCAC 10F .0305 BRUNSWICK COUNTY

(a) Regulated Areas. This Rule shall apply to the waters and portions of waters described as follows:

(1) Lockwoods Folly River in the Town of Varnamtown, from a point at 33.94966 N, 78.22587 W, 500 yards northwest of the boat ramp located at the end of SR 1123 otherwise known as Fisherman Road, to a point at 33.94498 N, 78.22206 W, 180 yards southeast of the boat ramp, and including the portion of the river otherwise known as Mill Creek where it meets Lockwoods Folly River directly across from the boat ramp, to a point 100 feet northeast at 33.94687 N, 78.22235 W;

(2) Calabash River in the Town of Calabash, from a point in the water at the end of Marina Drive at 33.88638 N, 78.56254 W to a point 650 yards southwest at the southern end of the deep-sea fishing docks at 33.88344 N, 78.56751 W;

(3) the Small Boat Harbor, shore to shore beginning at its intersection with the Intracoastal Waterway at a point at 33.91685 N, 78.02865 W;

(4) Shallotte River east of SR 1233, otherwise known as Village Point Road SW south of the Town of Shallotte, shore to shore from its intersection with the Intracoastal Waterway at a point at 33.91477 N, 78.37103 W to point 500 feet north at 33.91613 N, 78.37126 W;

(5) Montgomery Slough otherwise known as Davis Creek, within 100 yards of the hotel and marina at the northern end of 57th Place West in the Town of Oak Island;

(6) the waters in the natural and concrete canals located on the south side of the Intracoastal Waterway, east of N.C. Highway 904 in the Town of Ocean Isle Beach;

(7) Town Creek east of SR 1609, otherwise known as Clearview Lane in Town Creek Township, shore to shore from a point at 34.16788 N, 78.07139 W, north and east around a bend in the creek to a point at 34.16910 N, 78.07030 W;

(8) Montgomery Slough, otherwise known as Davis Creek, shore to shore from its entrance at the Intracoastal Waterway west of SW Yacht Drive at a point at 33.92145 N, 78.19408 W, to the canal end at NE 40th Street in the Town of Oak Island;

(9) Intracoastal Waterway in the Town of Sunset Beach, shore to shore from a point 150 yards east of the Sunset Boulevard South bridge at 33.88173 N, 78.50995 W, to a point 50 yards west of the bridge at 33.88111 N, 78.51194 W; and

(10) Intracoastal Waterway in the Town of Ocean Isle Beach, shore to shore from a point 100 yards east of the NC Hwy 904 Odell Williamson Bridge at 33.89578 N, 78.43870 W, to a point 100 yards west of the bridge at 33.89567 N, 78.44092 W.

(b) Speed Limit. No person shall operate a vessel at greater than no-wake speed within any of the regulated areas described in Paragraph (a) of this Rule.

(c) Placement of Markers. The following agencies shall be the designated agencies for the placement of markers implementing this Rule, subject to the approval of the United States Coast Guard and the United States Army Corps of Engineers:

(1) the Board of Aldermen of Varnamtown for areas indicated in Subparagraph (a)(1) of this Rule;

(2) the Board of Commissioners of Brunswick County for areas indicated in Subparagraphs (a)(2) through (8) of this Rule;

(3) the North Carolina Wildlife Resources Commission for the area indicated in Subparagraph (a)(9) of this Rule; and

(4) the Town of Ocean Isle Beach for the area indicated in Subparagraph (a)(10) of this Rule.

(d) Notwithstanding Paragraphs (a) through (c) of this Rule, no person shall operate a vessel at greater than no-wake speed in the waters of South Jinks Creek in the Town of Sunset Beach, beginning at a line north of the feeder channel, from a point on the west shore at 33.87617 N, 78.49297 W to a point on the east shore at 33.87664 N, 78.49164 W, then southeast to a point on the south shore at 33.87325 N, 78.49033 W, and all waters south and west of those lines including the feeder channel, four finger canals, and the bay area. The North Carolina Wildlife Resources Commission is the designated agency for placement and maintenance of markers for this regulated area.

History Note: *Authority G.S. 75A-3; 75A-15.*
Eff. February 1, 1976;
Amended Eff. April 1, 1997; July 1, 1994; July 1, 1993; January 1, 1989; January 1, 1987;
Temporary Amendment Eff. March 1, 1998;
Amended Eff. April 1, 2009; April 1, 1999;
Pursuant to G.S. 150B-21.3A, rule is necessary without substantive public interest Eff. December 6, 2016;
Amended Eff. May 1, 2021; July 1, 2018.

15A NCAC 10F .0305 - Temporary No Wake Zone Request
South Jinks Creek, Town of Sunset Beach, Brunswick County

Created by NCWRC, April 2023

EXHIBIT L

July 13, 2023

15A NCAC 10F.0333 LAKE WYLIE MARINE COMMISSION APPLICATION FOR RULEMAKING – RESTRICTED AREA AROUND SWIM BEACH AT SOUTH POINT ACCESS AREA, GASTON COUNTY

The Wildlife Resources Commission received a formal application from the Lake Wylie Marine Commission on behalf of Duke Energy Carolinas LLC, for an amendment to create a restricted area where vessel entry is prohibited, north of a line in a small cove east of the South Point Boating Access Area in Belmont in Gaston County. Also, staff requests that the Commission approve codifying the South Point Access Area no-wake zone into the NC Administrative Code.

Agency Enforcement completed a boater safety assessment matrix for waters of the cove where the swim beach is located (**Attachment A Matrix and Map**). South Point is the largest Boating Access Area on Lake Wylie in North Carolina. Vessel traffic is heavy at the location. The area within 50 yards of the boat ramps is a no-wake zone. However there have been multiple citations and warnings issued to vessel operators for violation of the no-wake zone and for boating while impaired. A restricted area in the cove will prevent vessels from entering the waters and will create a safer environment for swimmers in the cove.

Duke Energy Carolinas LLC is responsible for placement and maintenance of the markers for the restricted area. The NC Wildlife Resources Commission is responsible for placement and maintenance of the no-wake buoys located within 50 yards of the boat ramps.

Staff recommends that the Commission approve publishing Notice of Text in the *NC Register* for adoption of an amendment to 15A NCAC 10F .0333, with an open comment period of at least 60 days and one public hearing, per the requirements of the Administrative Procedure Act. Upon the close of the open comment period, the WRC will then consider adoption of the amendments to the Rule for Lake Wylie for the restricted area in the cove east of the South Point Boating Access Area and for the no-wake zone within 50 yards of the boat ramps there.

15A NCAC 10F .0333 MECKLENBURG AND GASTON COUNTIES

(a) Regulated Areas. This Rule shall apply to the following waters of Lake Wylie in Mecklenburg and Gaston ~~Counties:~~ counties.

(b) Speed limit in specific zones. No person shall operate a vessel at greater than no-wake speed in the following locations:

(1) McDowell Park. The waters of the coves adjoining McDowell Park and the Southwest Nature Preserve in Mecklenburg County shore to shore, east of the mouth of the cove at a line from a point on the south shore at 35.10272 N, 81.03026 W to a point on the north shore at 35.10556 N, 80.02964 W;

(2) Gaston County Wildlife Club Cove. The waters of the cove west of the Gaston County Wildlife Club on South Point Road in Belmont, north of a line at the mouth of the cove from a point on the east shore at 35.15628 N, 81.01427 W to a point on the west shore at 35.15628 N, 81.01615 W;

(3) Buster Boyd Bridge. The waters from a point 250 feet east of the Buster Boyd Bridge on N.C. Highway 49 in Mecklenburg County at 35.10293 N, 81.03932 W, to a point 150 feet west of the Buster Boyd Bridge at 35.10242 N, 81.04089 W;

(4) N.C. Highway 27 bridge. The waters shore to shore, from a point 50 yards north of the N.C. Highway 27 bridge in Mecklenburg and Gaston counties at 35.29849 N, 81.00346 W to a point 190 yards south of the N.C. Highway 27 bridge at 35.29635 N, 81.00424 W;

(5) Brown's Cove. The area beginning at the mouth of Brown's Cove in Mecklenburg County shore to shore, at a point at 35.16453 N, 81.00474 W, west to a point at 35.16480 N, 81.00309 W;

(6) Paradise Point Cove. The waters of Paradise Point Cove in Gaston County between Paradise Circle and Lake Front Drive, west of a line from a point on the south shore at 35.18853 N, 81.04036 W to a point on the north shore at 35.18991 N, 81.04136 W;

(7) Withers Cove. The waters of Withers Cove in Mecklenburg County, shore to shore, beginning at a line north of the Mecklenburg Charlotte Fire Department and Police Department Boathouse from a point on the west shore at 35.14632 N, 81.00383 W to a point on the east shore at 35.14713 N, 81.00173 W, and ending at a point 50 feet southeast of the Withers Bridge on SR 1116, otherwise known as Shopton Road, at 35.14576 N, 81.00187 W;

(8) Sadler Island. The waters shore to shore beginning at a line from a point on the west shore of Lake Wylie in Gaston County at 35.27481 N, 81.0138 W east to a point on the east shore of the Lake in Mecklenburg County at 35.27423 N, 81.01111 W, extending south on the Lake west of Sadler Island to a line from a point on the west shore of the Lake in Gaston County at 35.27079 N, 81.01525 W, east to a point on the west side of Sadler Island in Mecklenburg County at 35.27051 N, 81.01396 W, and the waters shore to shore east of Sadler Island in Mecklenburg County from a point at 35.27441 N, 81.01185 W, south-southwest to a line from a point on the south shore of Sadler Island at 35.26635 N, 81.01432 W, south to a point on the Lake shore at 35.26494 N, 81.01368 W;

(9) Other bridges. The areas within 50 feet of a bridge in North Carolina that crosses the waters of Lake Wylie that is not otherwise specifically mentioned in this Paragraph; ~~and~~

(10) South Point Boating Access Area in Gaston County. The waters within 50 yards of the South Point Boating Access Area, 199 Boat Launch Road in Belmont;

~~(10)~~ (11) Yachtsman on Lake Wylie Community. The waters within 50 yards of the community piers near the terminus of Waterside Drive in Mecklenburg County, and northward to include the waters east of

the island that is west of Point Lookout Road, ending at a line from a point on the northern end of the island at 35.12226 N, 81.03306 W, east to a point on the shore at 35.12253 N, 81.03190 W; ~~and~~

~~(11)~~(12) Brown's Cove. The waters of Brown's Cove in Mecklenburg County, beginning at a line from a point on the east shore at 35.16892 N, 80.99702 W to a point on the west shore at 35.16948 N, 80.99783 W, northeast to a line from a point on the south shore at 35.16913 N, 80.99556 W to a point on the north shore at 35.17043 N, ~~80.99684 W.~~ 80.99684 W; and

~~(b)~~ (13) ~~Speed Limit Near Ramps.~~ Other facilities. No person shall operate a vessel at greater than no-wake speed within 50 yards of a public boat launching ramp, dock, pier, marina, boat storage structure, or boat service area.

(c) Restricted area. No person operating or responsible for the operation of a vessel shall allow it to enter the restricted area with swim beach at the South Point Access Area in Gaston County, north of the rope in the cove east of the South Point Boating Access Area at 199 Boat Launch Road in Belmont.

~~(c)~~ (d) Speed Limit Near Marked Swimming or Mooring Areas. No person shall operate a vessel at greater than no-wake speed within 50 yards of a marked mooring area or marked swimming area.

~~(d)~~ (e) Placement and Maintenance of Markers. ~~The Lake Wylie Marine Commission shall be the designated agency for placement and maintenance of markers implementing this Rule.~~ The following agencies are the designated agencies for placement and maintenance of markers implementing this Rule:

(1) the Lake Wylie Marine Commission for the regulated areas designated in Subparagraphs(b)(1) through (9), and (11) through (13);

(2) the North Carolina Wildlife Resources Commission for the regulated area designated in Subparagraph (b)(10); and

(3) Duke Energy Carolinas, LLC for the regulated area designated in Paragraph (c).

History Note: *Authority G.S. 75A-3; 75A-15;*
Eff. July 1, 1980;
Amended Eff. July 1, 1994; June 1, 1985; June 1, 1984; March 1, 1983;
Temporary Amendment Eff. January 1, 1998;
Amended Eff. July 1, 1998;
Temporary Amendment Eff. February 4, 2000;
Amended Eff. April 1, 2009; June 1, 2004; July 1, 2000;
Temporary Amendment Eff. May 1, 2015;
Amended Eff. October 1, 2015;
Readopted Eff. October 1, 2018;
Amended Eff. June 1, 2023; June 1, 2022; May 1, 2019.

RESTRICTED AREA INVESTIGATION MATRIX

Attachment A

SECTION 1: APPLICANT REQUEST AND INFORMATION

- Name of organization/entity: Lake Wylie Marine Commission
- Primary contact information: Neil Brennan, Exec. Director [redacted]
- Location of requested no-wake zone:
  - Body of water and County: Lake Wylie in Gaston County
  - Location: swim beach east of Southpoint Boat Ramp, Boat Launch Road
  - Popular name of area, if any: South Point
  - Width of Restricted Area: Narrowest Point: 25 yards Widest Point: 65 yards
  - Brief Description of area (example: bridge overpass, obstructed views, Intracoastal Waterway; etc.)

    Restricted Area at the swim beach is requested by Duke Energy. Duke Energy is responsible for placement and maintenance of buoys and ropes associated with swim beach and restricted area.

Attach map of designated no-wake zone

Ensure proposed no-wake zone map/and or location is agreed upon by point of contact

Provide detailed reason given from point of contact for the request

Duke Energy requests a Restricted Area, where vessel entry is prohibited, surrounding the swim beach that is marked with yellow swim rope, adjacent to the Southpoint Boat Ramp on Boat Launch Road in Gaston County. The Lake Wylie Marine Commission requests assessment of statutory criteria for purposes of rulemaking for the Restricted Area to be incorporated into the NC Administrative Code.

- Is the proposed no-wake zone located within an area that is regulated by the U.S Army Corps of Engineers or the Division of Coastal Management (CAMA) i.e., Intracoastal Waterway?

  YES ■

  NO ☐

When dealing with the point of contact, please advise that placement of markers in these waters is subject to prior approval of above agency in waters where applicable. NCWRC has no authority to supersede these rules.

SECTION 2: PUBLIC SAFETY HAZARD

Identify all public safety hazards in this section by checking the block and listing name and/or location

☐ FUELING DOCK OR FACILITY

Name of Facility: _____

☒ PUBLIC SWIMMING OR RECREATIONAL AREA

Would the establishment of a roped swimming area or placement of no-wake regulatory buoys be more appropriate?

ROPED SWIM AREA ☒

NO-WAKE BUOYS ☐

☐ PUBLIC BOAT ACCESS

Name of Access Area: _____

☐ PUBLIC FISHING PIER OR FISHING ACCESS AREA

Name of Pier/Access Area: _____

☐ RESTAURANT DOCKS

Name of Restaurant: _____

Number of Docks: _____

☐ OTHER (list and describe)

SECTION 3: NAVIGATIONAL HAZARDS

Identify all potential hazards associated with the proposed RESTRICTED AREA (check all that apply)

☐ OBSTRUCTIONS (Identify) _____

_____

Can obstructions be removed? ☐ YES ☐ NO

☐ NARROW CHANNEL (give approximate width) _____

☐ SHALLOW WATER (give average depth) _____

☐ OBSTRUCTED VISION (for approximately how great a distance) _____

STRUCTURES: (Check all applicable)

- ☐ DAM Name: _____
- ☐ SPILLWAY Location: _____
- ☐ FLOOD CONTROL STRUCTURE Location: _____
- ☐ BRIDGE Roadway: _____
  Height above water: _____
  Width between piers: _____
- ☐ TRESTLE Height above water: _____
  Width between piers: _____
- ☐ POWER LINE _____
- ☐ LOCK Lock Number: _____
- ☐ JETTY _____
- ☐ SUBMERGED STRUCTURE Identify Structure: _____

  _____

  - Would placement of "Danger" buoys or other informational markers mitigate the hazards in lieu of a no-wake zone? ☐ YES ☐ NO
- ☐ SANDBAR _____
- ☐ SHOAL _____
- ☐ OTHER (list and describe)

SECTION 4: SUMMARY OF BOATING SAFETY STATISTICS

Identify known data reflecting safety concerns:

☐ BOAT INCIDENTS Date(s): _____

☒ CITATIONS ISSUED Violations: No Wake Zone violations and Operating While Impaired

☒ VERIFIED COMPLAINTS List: No Wake Zone violations

==========

- Rate traffic density in this area HEAVY ☒
- Is traffic density specific to weekend/and or holidays? YES ☐ NO ☒
- Does traffic density or ability to maneuver a vessel due to traffic cause safety issues?
  YES ☐ NO ☒

SECTION 5: CURRENT REGULATIONS

- List existing local laws currently in place restricting vessel speed in the requested area:
  There is a no wake zone in the waters around the requested exclusion area.

- Would enforcement of existing boating laws mitigate the issues and concerns addressed in the proposed area?

☐ YES Identify Violations: _____
☒ NO

SECTION 6: NO-WAKE ZONE DIMENSIONS AND SCOPE

Evaluate the applicant's proposed no-wake request based on criteria and complete Section 6. If investigated area does not meet criteria for a no-wake zone, move to section 7. If the area meets no-wake zone criteria but the proposed area exceeds the need to address the issues, recommend appropriately sized area and attach map with changes.

A. PROPOSED

- If approved, does no-wake zone extend into a designated channel?

  ☐ YES Distance extended into channel: _____
  ☒ NO

- Total distance travelled at no-wake speed (in feet): N/A

- Estimated travel time through propose area at no-wake speed: N/A

- Width of proposed no-wake zone (in feet): Narrowest: N/A Widest: N/A

- Does proposed no-wake zone meet criteria for consideration?

  ☒ YES: Appropriately sized
  ☐ YES: Adjusted size recommended
  ☐ NO

- Description/Explanation of adjusted size

- ☐ Adjusted map attached

SECTION 7: OFFICER ASSESSMENT OF WATER SAFETY HAZARDS

- Does the proposed area meet the criteria to be recommended as a no-wake zone?

  YES: ☒

  NO: ☐

- Justification:
  The area requested for an exclusionary zone is known for heavy boat traffic. This area is the largest Boating Access Area located in North Carolina for Lake Wylie. Not only is the vessel traffic heavy on the weekend and holidays but, during the week as well. Many times due to boat traffic; vessels will stage in the cove that has been requested for exclusion. There have been many citations and warnings issued for no wake zone violations in this area and several impaired operation cases yearly.

Officer: Jenrette Springs 844 Date: 6/22/2023

Sergeant: Phillip Tallent 864 Date: 6/22/2023

Requested No-Wake Zone Amendment and Restricted Area
WRC South Point BAA, Lake Wylie, Gaston County

Created by NCWRC, June 2023

EXHIBIT M-1

BOG TURTLE
CONSERVATION PLAN for NORTH CAROLINA

July 13, 2023

NORTH CAROLINA WILDLIFE RESOURCES COMMISSION

THANK YOU TO ALL WHO CONTRIBUTED TO THE PLAN!

We want to thank the many organizations and people who contributed to the Bog Turtle Conservation Plan for North Carolina. It is a much stronger plan with the incredible involvement of these collaborators. We appreciate the time they took to provide valuable input and feedback. A big thank you to all who were involved!

Contributors to the NC Bog Turtle Conservation Plan

Project Bog Turtle (PBT), N.C. Wildlife Resources Commission staff and Commissioners, U.S. Fish & Wildlife Service (USFWS), U.S. Forest Service (USFS), National Park Service (NPS), Natural Resources Conservation Service (NRCS), The Nature Conservancy (TNC), NC State Parks, NC Natural Heritage Program, NC State College of Veterinary Medicine, NC Museum of Natural Sciences, Clemson University, North Carolina Wildlife Federation (NCWF), Tangled Bank Conservation LLC, Conserving Carolina, Blue Ridge Conservancy, Defenders of Wildlife, and Catawba Lands Conservancy.

TABLE OF CONTENTS

Cover page (from left to right, clockwise): Juvenile bog turtle (Gabrielle Graeter); probing for bog turtles (NCWRC); adult bog turtle (Jeff Hall); Juvenile bog turtle (Gabrielle Graeter)

EXECUTIVE SUMMARY

The bog turtle (*Glyptemys muhlenbergii*) occurs in the Blue Ridge Mountains and upper Piedmont eco-regions of North Carolina and is federally listed as Threatened by Similarity of Appearance with the northern population, which is federally listed as Threatened. Bog turtle habitat is typically dominated by sedges and sphagnum moss, has thick, soft muck, saturated soils, and numerous springs, with areas lacking canopy and others having shrubs and scattered small trees. Although there are 120 wetlands in NC with one or more records of a bog turtle, only 15 of those have had 10 or more individual bog turtles captured over the past 10 years. Sites with robust populations of 30 or more turtles likely number fewer than 10. Since the bog turtle was federally listed in 1997, it has become clear that the species faces the same threats in the southern United States as in the north. There is significant concern for this species in North Carolina as relatively few bog turtle populations remain, and most of those appear to be in decline. The North Carolina Wildlife Resources Commission (NCWRC) and partners are working to understand and address the numerous threats and implement persistent management, including restoration, of bog turtle habitat in the state. Many of the threats that this species faces originate from human land use, such as development and land use changes in the watershed. Wetland loss and degradation, vegetative succession, altered hydrology, increased predation, vehicles, barriers to movement, invasive species, disease, climate change, inappropriately managed grazing, and illegal collection and trade are threats to this species and its habitat. Ensuring the long-term viability across its current range in North Carolina for the next 100 years will require a continued multi-faceted approach to address the threats to bog turtles, which often vary in importance from site to site. Filling information gaps about distribution, monitoring populations, conducting research into limiting factors, habitat management and restoration, population management, land protection, outreach, and regulations and enforcement are all strategies the NCWRC will continue to support and use to achieve this goal.

BIOLOGICAL INFORMATION

Description and Taxonomic Classification

The bog turtle (*Glyptemys muhlenbergii*) is the smallest freshwater turtle in North America. Its most distinguishing feature is a large, bright yellow to orange blotch on each side of its brown head. The carapace and plastron are light brown to dark brown or black, and the scutes on the carapace sometimes have a light center or pattern of lines radiating out. It has a moderately domed carapace with a low keel, and the plastron is hinge-less. According to Ernst and Lovich (2009), the maximum straight-line carapace length (SCL) is 11.5 cm (4.5 in) for males and 9.6 cm (3.8 in) for females. In North Carolina, the maximum SCL recorded for males is similar at 11.1 cm SCL, but there is a record of a slightly larger female (11.0 cm SCL).

The *Glyptemys* genus comprises only two species — the bog turtle and the wood turtle (*Glyptemys insculpta*). Before 2001, the bog turtle and wood turtle were considered part of the genus *Clemmys*, but morphological and genetic analyses indicated these two species were much more closely related to each other than to the spotted (*Clemmys guttata*) or western pond turtle (*Actinemys marmorata*; Holman and Fritz 2001). Thus, the bog turtle and wood turtle were moved to the newly created *Glyptemys* genus, leaving the spotted turtle as the sole member of the *Clemmys* genus.

Life History and Habitat

Female bog turtles are sexually mature at about 6-7 years, though maturation can vary geographically (Ernst and Lovich 2009). They typically mate in spring, from March-June, and 21-31 days after copulation, females lay their eggs, with most nests laid from May-July. They choose locations in sedge and rush tussocks or sphagnum moss and lay from 1-6 eggs, with averages of 3.1-eggs reported from a Maryland study and 3.28-eggs from a recent study in North Carolina (Wilson et al. 2003, Knoerr 2018).

The species is found in a variety of spring-fed bogs and fens that have soft saturated soils, including the Swamp-Forest Bog Complex, Southern Appalachian Bog, French Broad Valley Bog, Low Mountain Seepage Bog, and Southern Appalachian Fen (Schafale 2012). They are also found in "meadow bogs," which have a plant community degraded from their original condition due to anthropogenic influences (Herman 2000); therefore, meadow bogs are not included in Schafale's classification system (2012). Bog turtle habitat is typically dominated by sedges and sphagnum moss, has thick, soft muck, saturated soils, and numerous springs, with some areas lacking canopy and others having shrubs and scattered small trees (Buhlmann et al. 2008, Feaga et al. 2012). Plants often associated with these wetlands include sedges (*Carex* spp.), rushes (*Scirpus* sp., *Juncus* sp.), sphagnum moss (*Sphagnum* spp.), skunk cabbage (*Symplocarpus foetidus*), poison sumac (*Rhus vernix*), alder (*Alnus* spp.), willows (*Salix* spp.), and a variety of ferns (Herman and George 1986, Tryon 1990). Meadow bogs have many of the same components of the classified bog community types, including similar hydrology, soil types, and vegetation, but are sometimes lacking the same plant diversity. Bog turtles are often found in meadow bogs, including those that are currently grazed or have a history of grazing.

Gary Peeples/USFWS

Most publications describe the habitat features observed in sites inhabited by bog turtles rather than specifying the habitat needs of bog turtles. Herein we define “suitable habitat” and “high-quality bog turtle habitat” based on what we know of bog turtle ecology and habitat use in North Carolina (see Glossary). The terms are likely applicable to bog turtle habitat in other states and regions.

1. *Suitable bog turtle habitat will contain the following, at a minimum*:
   1) soft, saturated soils
   2) spring-fed hydrology, and
   3) an area with low vegetation (no canopy) that gets full sun.
2. *High-quality bog turtle habitat consists of the above plus the following characteristics*:
   1) areas with deep, loose, low-strength soils (Feaga et al. 2013),
   2) presence of sphagnum mosses, rushes, sedges, and some wetland shrub species,
   3) mosaic of low and shrubby vegetation with one or more relatively large areas with very low vegetation (ideally sphagnum, but also rushes and sedges) that receive full southern exposure sun,
   4) relatively unaltered hydrology with stable groundwater levels that are 8 cm ± 1 cm (3.1 in ± 0.4 in) average depth from surface over multiple years, without flooding and inundation (Feaga 2010),
   5) presence of subsurface root structures and/or tunnels,
   6) adequate vegetation to conceal turtles when basking on surface,
   7) minimal land-based threats within habitat and / or adjacent property (e.g., busy roads, exotic-invasive plant species, etc.).

Southern Appalachian Bog (Gary Peeples/USFWS)

Distribution and Population Status

In North Carolina, the bog turtle is found in the Blue Ridge Mountains and upper Piedmont eco-regions, and records exist within the Middle Tennessee-Hiwassee, Upper Tennessee, French Broad-Holston, Savannah, Santee, Upper Pee Dee, Kanawha, and Roanoke river basins (Beane et al. 2010; NCNHP 2021). The species has been documented in the following 25 counties: Alexander[1,2], Alleghany, Ashe, Avery, Buncombe, Burke, Caldwell[2], Catawba[2], Cherokee[1,2], Clay, Forsyth[1,2], Gaston, Graham[1,2], Henderson, Iredell[1], Macon, McDowell, Mitchell[2], Polk[2], Rutherford[2], Surry, Transylvania, Watauga, Wilkes, and Yancey (Fig. 1; NCNHP 2020).

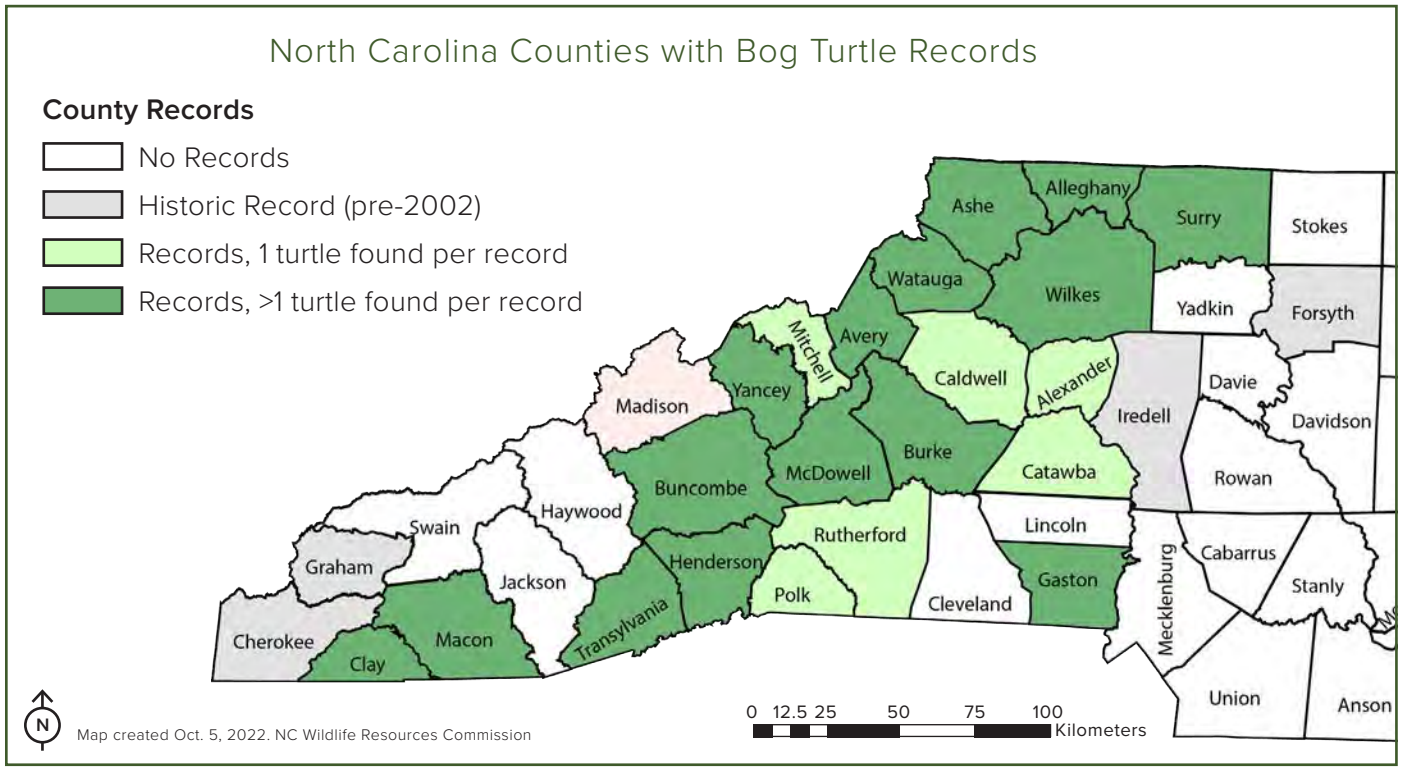


Figure 1. *North Carolina counties with bog turtle records, including counties that only have historical records (4 counties), counties with at least one extant record but with only one turtle ever observed per record (6 counties), and counties with at least one extant record with more than one turtle observed (15 counties). A record is historical if there is no documentation of the species from 2002-2021.*

[1] Counties where a live bog turtle has not been found in recent surveys (i.e., last 20 years, from 2002-2021).

[2] Counties that only have single road records and/or sites with only one turtle ever captured.

The southern population of bog turtle is federally listed as Threatened due to Similarity of Appearance (T(S/A)) and state listed in North Carolina as Threatened. The species is ranked S2 (State Imperiled; typically, 6-20 occurrences or few remaining individuals) by the North Carolina Natural Heritage Program and has a global rank of G2 (Imperiled – at high risk of extinction; NCNHP 2020, NatureServe 2021). The IUCN Rank for the species is Critically Endangered.

Surveys for the species have occurred regularly since the mid-1970s in the state (Herman 2003). There are 167 confirmed occurrence records for the species in the state — 36 of which are solely road records with no habitat present nearby (likely individuals dispersing on landscape), seven are locations without any known wetland habitat, and four are locations where the habitat (and often the exact location) is unknown (Fig. 2). One hundred twenty (120) location records are from wetland habitat — 38 of which are not considered a population because only one turtle was found at each of these locations. Of the 120 records from wetland habitat, only 82 sites have a record of two or more individual turtles being captured and have the potential to be considered a population based on known numbers (Fig. 2).

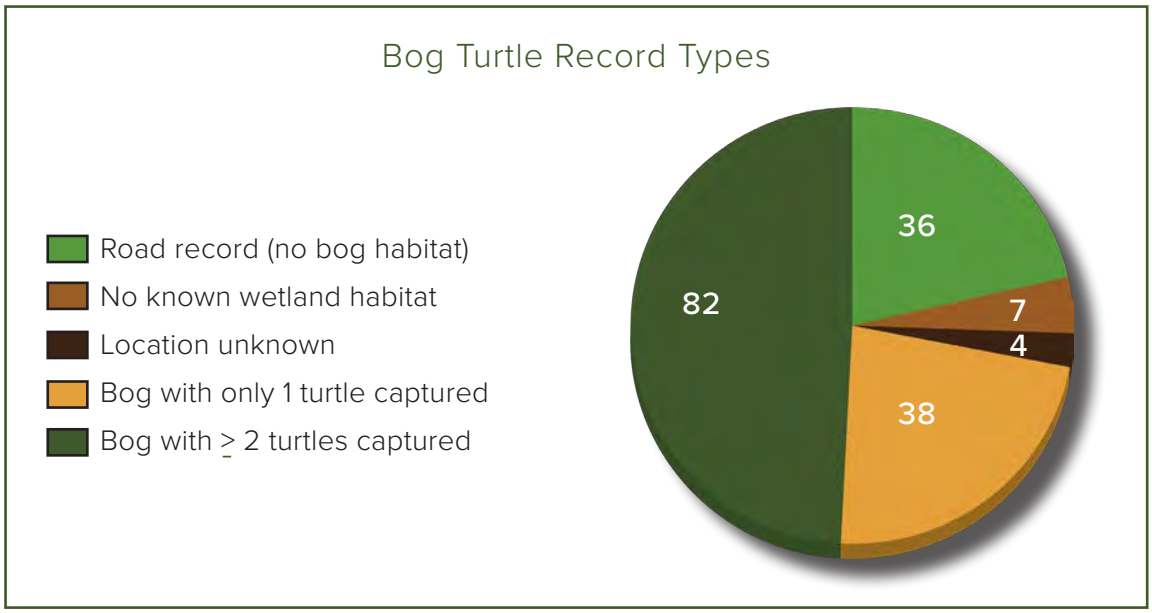


***Figure 2**. Breakdown of the number of each record type for bog turtles in North Carolina as of February 10, 2021. Of 167 total locations with bog turtle records, only 82 have a record of 2 or more individual turtles being captured.*

There are 120 wetlands in North Carolina that have bog turtle records, but only 23 of those have had ≥10 individual bog turtles captured over the past 20 years (Fig. 3). Only 15 sites have had ≥10 individual bog turtles captured in the most recent 10 years, indicating a decline from the original 23 sites. A population of 10 turtles is below the species' Minimum Viable Population threshold of 15 adult females (Shoemaker et al. 2013). This species generally has a 1:1 female-male ratio, meaning we are aiming for a minimum of 30 adults (15 females, 15 males). However, we only know of 10 sites that have had ≥30 turtles captured over the past 20 years, and this is slightly inflated because our numbers in this calculation include hatchlings and juveniles (Fig. 3). Using this definition, only 8% (10 populations) of the original 120 wetlands with bog turtle records are considered potentially viable populations today (Shoemaker et al. 2013). Survey effort was not recorded during the first portion of the 20-year period examined; therefore, that measure cannot be incorporated into our analyses. Further, there have been constraints on our ability to survey sites evenly due to property access and staff capacity issues, and limitations of available monitoring techniques. Hence, we focus survey and monitoring efforts on a subset of sites that include the most viable populations. We deduce that if the best, most viable and abundant populations are in decline, then populations at sites where we rarely locate a turtle, are also in decline. Recently we have developed additional monitoring techniques and received additional funding that is allowing us to evaluate understudied and historical populations. Soon we will have a more comprehensive summary of the status of the species. Until then, the best available data indicate that there are ≤10 robust bog turtle populations in North Carolina.

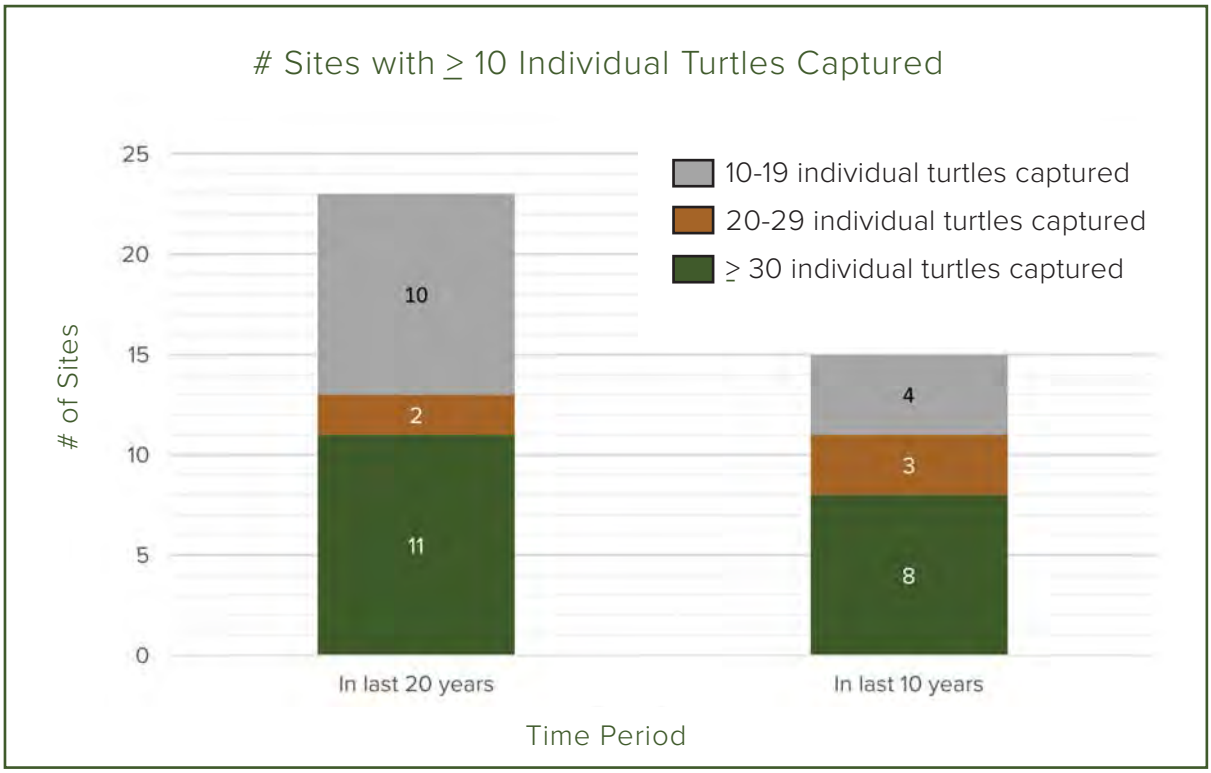


Figure 3. *Twenty-three sites have had ≥10 individual bog turtles captured over the past 20 years in western North Carolina. The number of sites with 10-19, 20-29, and ≥ 30 individual turtles observed over the past 20 years (2001-2020) and past 10 years (2011-2020) differ, but overall, the number of sites with bog turtles present has declined.*

Tutterow et al. (2017) found adult survivorship of bog turtles in North Carolina varied from 0.855 to 0.942 among eight intensively sampled populations — all below a 0.96 adult survival estimate documented for northern bog turtle populations (Shoemaker et al. 2013). Because these eight sites include the most robust known bog turtle populations in the state, other, less robust populations in North Carolina likely exhibit relatively low survival. Juvenile survivorship was evaluated at three sites that had adequate data and varied from 0.510 to 0.68, with the lower survivorship of 0.510 from a population in decline (Tutterow et al. 2017). We also observed a skew in age classes across all but two sites, with populations dominated by older individuals and few juveniles (Tutterow et al. 2017). Population models for a subset of these sites indicated that only the two most robust populations known to NC are considered stable, with all other known populations considered to be in decline (Tutterow et al. 2017, Knoerr 2018, NCWRC unpublished data). These estimates suggest without additional efforts, local and regional extirpations may occur (Pittman et al. 2011; Tutterow et al. 2017, Knoerr 2018).

Historical and Ongoing Conservation Efforts

There is a long history of bog conservation efforts by a diverse partnership in western North Carolina. Partners include, but are not limited to the following, Project Bog Turtle (PBT), NCWRC, U.S. Fish and Wildlife Service (USFWS), National Park Service, U.S. Forest Service, NC State Parks, NC Museum of Natural Sciences, NC Natural Heritage Program, The Nature Conservancy (TNC), Conserving Carolina, Blue Ridge Conservancy, Catawba Lands Conservancy, Tangled Bank Conservation, private landowners, and universities including UNC-Asheville, Appalachian State University, Clemson University, and Western Carolina University. In the 1970s, Dennis Herman and Robert Zappalorti began surveying for bog turtles in North Carolina and discovered many populations. In the late 1980s, several other NC Herpetological Society members, including Jeff Beane and Thomas Thorp, began to assist with bog turtle surveys. In 1995, Project Bog Turtle (PBT) was established and has been dedicated to locating and surveying populations and conserving bog turtles and their habitat in North Carolina. Since it was founded, PBT has hosted an annual meeting to coordinate and share information with collaborators.

Bog turtle nest (Gabrielle Graeter)

In the early 2000s, NCWRC biologists became more involved and began leading bog turtle survey and habitat management and restoration efforts in close collaboration with partners, including PBT. Increasingly, NCWRC biologists have been involved in monitoring bog turtles, primarily through collection of mark-recapture population data, but also through telemetry and monitoring of nests and habitat condition. The population dataset has yielded valuable information about population demographics, survivorship, population size, and trends.

NCWRC biologists have also played a key role in protection of mountain bogs via collaboration with private landowners, land trusts, and other partners to bring about fee-simple purchases, donations, and conservation easements. NCWRC has led and coordinated multiple research studies to increase our ability to make science-based management and conservation decisions for the species, including research on hydrology, nesting success, predation, and habitat use. Recently, NCWRC has advanced knowledge about nest success and egg survivorship, which has informed population management activities, including nest protection, predator deterrence, and head-starting methods.

Interest in conservation and management of mountain bogs has broadened and intensified. In 2015, the Mountain Bogs National Wildlife Refuge was established, with most of the refuge's footprint in North Carolina. The refuge will complement and expand existing conservation efforts by offering additional opportunities to protect sites via fee title or conservation easement and other avenues such as landowner stewardship agreements. Around the same time, a new partnership, the Bog Learning Network, was formed. The Bog Learning Network is a consortium of scientists and land managers working to advance the restoration and management of Southern Appalachian Bogs. In North Carolina, biologists with the USFWS and NCWRC have begun working more closely with biologists who work in the northern range of the species. This group may develop a regional bog turtle conservation plan for the southern population like the Conservation Plan written for the northern population (Erb 2019), which could be helpful in gaining additional funding for bog turtle conservation. Going forward, collaboration and communication with these partners will be essential to meeting conservation goals for the bog turtle in North Carolina.

Cordie Diggins, a wildlife diversity technician with the NCWRC, probes the ground searching for bog turtles in Ida's Bog. (NCWRC)

THREAT ASSESSMENT

Reason for Listing

The USFWS listed the northern population of bog turtles as federally Threatened on November 4, 1997, noting that the species "is threatened by a variety of factors including habitat degradation and fragmentation from agriculture and development, habitat succession due to invasive exotic and native plants, and illegal trade and collecting." The southern population was simultaneously listed due to Similarity of Appearance to the northern population of this species (USFWS 1997). In the Federal Register, the USFWS identified its reasons for not proposing the southern population for listing: "(1) the recent discovery of bog turtle sites in the Piedmont physiographic province of North Carolina, well outside the species' previously known Appalachian Mountains range; (2) limited information regarding threats; and (3) inadequate survey coverage within the southern range" (USFWS 1997). Further, the USFWS stated that "A comprehensive status survey of the southern population is currently underway and is anticipated to be completed by December 1999. The Service agrees that it is premature to draw any conclusions regarding the status of the southern population until additional survey and threat information becomes available" (USFWS 1997). In 2003, a status report on the southern population was completed (Herman 2003). In North Carolina, an additional 36 records in 10 counties were discovered — three of which were new county records (Herman 2003). At the time, the author estimated that there were 53 populations in the state, with 30 designated as "viable or potentially viable," distributed across 21 counties in North Carolina (Herman 2003).

There is significant concern for the bog turtle in North Carolina as relatively few populations remain, and most appear to be in decline.

In the "Bog Turtle Northern Population Recovery Plan," which officially applies only to the northern population, the following are cited as reasons for listing the species: (1) Continued loss, alteration, and fragmentation of habitat, (2) Illegal trade and collection, (3) Inadequacy of existing regulatory mechanisms to protect bog turtle habitat, and (4) Disease and predation (USFWS 2001). The species faces the same threats in the southern United States (Tutterow et al. 2017). In fact, the USFWS recently completed a 90-day finding for a petition to list the southern population and will initiate a status review (Federal Register 2022). There is significant concern for this species in North Carolina as relatively few bog turtle populations remain, and most appear to be in decline (Knoerr 2018, NCWRC unpublished data 2021). North Carolina General Statute (G.S.) 113-334 (a) gives all native or resident wild animals which are on the federal lists of endangered or threatened species pursuant to the Endangered Species Act, the same status on the North Carolina protected animals lists.

(Jeff Hall)

Present and Anticipated Threats

Threats to bog turtles include habitat loss and degradation, altered hydrology, vegetative succession within the wetland, inappropriately managed grazing, invasive species, increased predation, vehicles, barriers to movement, disease, climate change, and illegal collection and trade. Many of these threats influence or are somehow interconnected with others, some are long-term and may affect all bogs (e.g., climate change, invasive species), and others are immediate and vary in intensity depending on the specifics of each site. The impacts of some threats on the population and bog habitat are largely unknown, but research and monitoring are beginning to elucidate the significance of various threats and identify new ones. Presently, NCWRC and partners are taking conservation and management actions with the best available data and information and using an adaptive management approach to continually improve these efforts.

Wetland Loss and Degradation

About 80-90% of bog habitats have been lost over decades of land-use conversion (Weakley and Schafale 1994, Noss et al. 1995). Wetland loss and degradation occur when bogs are converted to another use such as a pond, agricultural field, or urban area or when only a remnant of the habitat remains. Remaining bogs are subject to a myriad of side effects of changes in the surrounding landscape. For example, an increase in impermeable surface area generally leads to increased stormwater run-off and erosion, as well as increased loads of nutrients and pollutants from urbanized landscapes. Similarly, agricultural activity within the watershed of a bog can result in runoff of nutrients, toxins, and sediments (Torok 1994, Gustafson and Wang 2002, Feaga 2010, USFWS 2014). Even when some wetland remains, it is often reduced in size and/or ecological integrity, with the habitat quality diminished, which may have impacts on bog turtle occupancy and abundance (Stratmann et al. 2019). Almost every remaining mountain bog shows evidence of past human manipulation. Many sites were ditched and drained for agriculture or livestock or flooded to form ponds or lakes and these activities are still occurring. Most known wetlands with bog turtles in North Carolina are privately owned with no long-term protective measures in place. Lack of land protection leaves many sites vulnerable to future habitat loss through ditching, draining, and other harmful activities. However, good landowner stewardship can maintain or improve habitat while in that individual or family's ownership.

Mountain bog (Jeff Hall)

Altered Hydrology

Changes in a watershed and within a bog can have detrimental effects on the hydrology of a bog and the resident bog turtles (Torok 1994, Brennan et al. 2001, Feaga 2010). Flooding occurs due to poor stream bank condition, human-made barriers that hold back or alter water flow (e.g., driveways, berms, ditches), increases in storm flow volumes due to development, and sometimes due to beaver activity, and can be exacerbated by extreme storm events. Flooding affects bog turtle nesting and hatching success, and specifically, studies in NC and elsewhere found that inundation from flooding caused egg failure (Zappalorti et al. 2015, Knoerr et al. 2020). In a relatively unaltered landscape and watershed, beaver activity may benefit bog turtles (see Conservation Actions). However, beaver activity can be detrimental to a bog turtle population if a site is very small and the entire wetland is flooded for long periods of time (Sirois et al. 2014). This scenario is typically observed when a wetland has been reduced in size due to human activities and the surrounding landscape is altered. In this case, when the beavers flood the wetland, turtles may have no suitable habitat available and thus, very little nest success. In addition to flooding, draining of wetlands can be a side effect of increased storm flows that create head cuts which increase the amount of outflow from the bog. Indirect draining occurs when changes in the watershed affect groundwater recharge, such as residential and commercial wells or impervious surfaces, and thus impact the spring heads that supply the bogs.

Bog turtle habitat with overgrown vegetation (NCWRC)

Wetland Vegetative Succession

Diminished natural disturbance factors, increased nutrient input, and altered hydrology result in natural vegetative succession within bogs, whereby herbaceous grasses, forbs, and shrubs are replaced over time by large shrubs, saplings, and eventually trees. Because bog turtles and other species that require direct sun struggle to nest and produce young successfully, and do not have adequate sunlight for thermoregulation and other activities, they may leave these sites or perish.

Inappropriately Managed Grazing

The presence of grazers can provide many benefits to bog turtles and their habitat via bioturbation and grazing (see Vegetation Management in the Conservation Actions section). However, inappropriately managed cattle or other livestock may impact bog turtle populations. Bog turtle nests may be trampled and eggs destroyed by cattle (Knoerr 2018). NCWRC biologists and partners have documented 18 injuries and three deaths of bog turtles that were attributed, because of the shape of the injury, to being stepped on by livestock (NCWRC unpublished data). Although we have documented injuries and deaths that appear to be from livestock, we know very little about the frequency of occurrence and population-level effects.

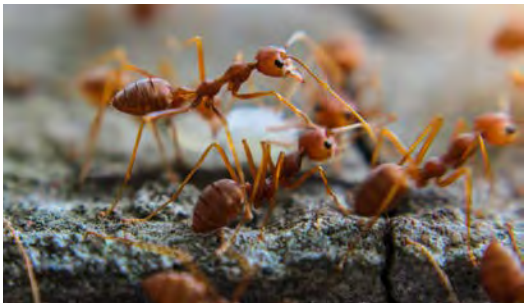
Inappropriately managed grazing can negatively affect bog conditions. Significant increases in nutrient concentrations can occur when cattle are stocked at high densities (Line et al. 2000). An increase in nutrient load to an otherwise nutrient-poor system, in conjunction with soil disturbance, can facilitate invasion of the habitat by exotic vegetation, altering the plant community (USFWS 2001). Inappropriately managed grazing can also cause excessive soil exposure, soil compaction, denuding of sphagnum moss and herbaceous vegetation, and destruction of rare plants (USFWS 2001, 2010). Similarly, inappropriately managed livestock grazing can result in destabilized streambanks and worsening headcuts, thereby threatening habitat quality (Yochum 2018). More research and adaptive management are needed to inform decisions about appropriate timing and intensity of grazing under different scenarios and to strengthen current recommendations (USFWS 2019). When under conservation ownership or a private landowner is interested, much of this threat can be turned into a conservation tool with site-specific management plans that have appropriate grazing management.

Invasive Species

In general, wetlands are especially vulnerable to invasions by aggressive plants. Less than 6% of the land on Earth is classified as wetlands, but 24% of the most invasive plant species are wetland obligates (Zedler and Kercher 2004). The accumulation of debris, sediments, water, and nutrients in wetlands helps facilitate invasions by creating canopy gaps, accelerating the growth of opportunistic plant species, and through direct input of invasive seeds (Zedler and Kercher 2004). Furthermore, many invasive wetland species grow as a monotype, resulting in lower biodiversity, altered habitat structure, and modified food webs (Zedler and Kercher 2004). NCWRC staff have documented many non-native invasive plant species in or adjacent to bogs, including autumn olive (*Elaeagnus umbellata*), Chinese lespedeza (*Lespedeza cuneata*), Chinese privet (*Ligustrum sinense* and *L. vulgare*), Chinese silvergrass (*Miscanthus sinensis*), common reed (*Phragmites australis*), Japanese barberry (*Berberis thunbergii*), Japanese honeysuckle (*Lonicera japonica*), Japanese knotweed (*Polygonum cuspidatum*), Japanese stiltgrass (*Microstegium vimineum*), murdannia (*Murdannia keisak*), multiflora rose (*Rosa multiflora*), oriental bittersweet (*Celastrus orbiculatus*), purple loosestrife (*Lythrum salicaria*), reed canarygrass (*Phalaris arundinacea*), and yellow flag iris (*Iris pseudacorus*), among others. There are several documented cases of invasive plant species, such as reed canary grass, common reed, and purple loosestrife, forming a monotype in a bog and adversely affecting the habitat quality for bog turtles and other wildlife (e.g., Blossey 2002; Warwick 2014).

NCWRC staff have documented many non-native, invasive plant species in bogs, including (from left to right) purple loosestrife (Shutterstock) and reed canarygrass (Simona Pavan), as well as multiflora rose (Wikipedia) adjacent to bogs.

Wildlife not native to the bog may also pose a threat to bog turtles, especially any species that affects nest success and juvenile or adult survivorship. One animal of particular concern is the red imported fire ant (*Solenopsis invicta*). This species has been documented in 75 of North Carolina's 100 counties, including 11 counties with bog turtle records (Burke, Catawba, Cherokee, Clay, Gaston, Graham, Iredell, Macon, McDowell, Polk, and Rutherford) (NCDA&CS 2021). Fire ants have been documented preying upon nests of gopher tortoises (*Gopherus polyphemus*), snapping turtles (*Chelydra serpentina*), Florida cooters (*Pseudemys floridana*), and yellow-bellied sliders (*Trachemys scripta scripta*) in the wild (Allen et al. 2004; Aresco 2004). To our knowledge, the fire ant has not been documented within a bog turtle wetland in North Carolina. Given what we know about their aggressive behavior and their proclivity to invade newly disturbed areas, fire ants should be of great concern when it comes to these fragile ecosystems, especially considering the vulnerability of bog turtle nests and the small size of juvenile turtles.



Although not yet documented in a bog turtle wetland in NC, the fire ant is of great concern to the viability of bog turtle nests and survival of juvenile bog turtles. (Shutterstock)

Increased Predation

Data suggest that low nest success and juvenile survival are important limiting factors for turtles in general (Congdon et al. 1983) and specifically for bog turtles in North Carolina (Tutterow et al. 2017; Knoerr et al. 2020). We have very few bog turtle populations in the state with all age classes represented (i.e., many have only adults), so something is out of balance. Also, we have documented high predation rates at some sites over multiple years. A recent study on nest success in four populations in North Carolina found that only 28% of eggs hatched, with the highest egg survival being 60% at one site and predation accounting for much of the nest failure (Knoerr et al. 2020). Mesopredators accounted for 68% of egg predation and small mammals were responsible for 31% of egg predation (Knoerr et al. 2020). A recent Maryland predation study observed approximately 40% of eggs preyed upon at one site and as many as 74% at another over a 2-year period (Byer 2015). Additionally, Macey (2015) documented a 62% predation rate over a 4-year period at 24 unprotected nests across nine sites in southeastern New York. One study demonstrated that even with 100% mitigation of road mortality effects, a population of semi-aquatic turtles would still be declining due to increased predation (Crawford et al. 2014), demonstrating the large impact predation can have in some systems.

Recently hatched bog turtle (Mike Knoerr)

Several studies have linked turtle nest predation rates to the landscape matrix (Kolbe and Janzen 2003, Marchand and Litvaitis 2004). Human-commensal predators such as raccoons (*Procyon lotor*), striped skunks (*Mephitis mephitis*), and red foxes (*Vulpes vulpes*), often termed mesocarnivores or mesopredators, often represent the largest sources of increased predation in altered habitats (USFWS 2001).

Although predation is a natural part of the ecosystem that bog turtles inhabit, some areas have a higher abundance of mesopredators now due to human-caused food supplementation, as well as reduced or absent top predators (Prugh et al 2009; Newsome et al 2014). However, mesocarnivore use of altered landscapes varies depending upon local environmental and social factors and management actions are likely to be most effective when decisions are based upon locally derived data (Rodriguez et al. 2021).


(Shutterstock)

Domesticated pets may also be threats to bog turtles, primarily house cats (*Felis catus*) and dogs (*Canis familiaris*). With their small size and lack of a hinge on the plastron, it is likely that adult bog turtles are more vulnerable than many other turtle species to predation by domesticated pets. Many bogs are located within a fragmented and developed landscape with residential areas, and thus, a source of cats and dogs that may be allowed to roam. Loss et al. (2013) estimated that annually 86-320 million amphibians (median 173 million) and 228-871 million reptiles (median 478 million) are killed by house cats in the continental United States. The North Carolina bog turtle database documents 24 injured and two dead turtles from bites, presumably a mix of native predators and domesticated pets (2017). Although the degree of impact is unknown, dogs have been documented to injure and kill bog turtles in North Carolina and Virginia (McCoy et al. 2020).

Vehicles

Roads present a major threat to small animals, including turtles (Gibbs and Shriver 2002, Aresco 2005, Marsh and Jaeger 2015). Beyond direct mortality, roads can have numerous other deleterious effects, including behavioral effects, decreased dispersal between habitats, reduced abundance, and loss of genetic diversity (Marsh and Jaeger 2015). Turtles are slow-moving animals and mortality risks as high as 95% per crossing attempt have been documented for turtles (Aresco 2005). The NC bog turtle database has 62 records of bog turtles found on roads in the state (43 alive, 20 dead) from 1951 to 2020 (Project Bog Turtle, NC Museum of Natural Science, NCWRC unpublished data). Long-term demographic studies of turtle populations have indicated that a 2-3% annual road mortality rate is likely to cause population declines (Gibbs and Shriver 2002). Likewise, at a landscape scale, reduction of a population's dispersal ability can slowly drive a metapopulation to extinction (Marsh and Jaeger 2015). Other vehicles and equipment, such as tractors, mowers, and other farm machinery can injure and kill turtles (Saumure et al. 2007, USFWS 2019). Bog turtles have been documented spending time in the fields surrounding some wetlands (Pittman and Dorcas 2009) and NCWRC biologists and partners have captured three injured and two dead bog turtles over the years that have long, deep injuries to the shell that appear to be caused by a blade (NCWRC unpublished data). It seems likely that some bog turtles are crushed and injured, but little is known about the population effects of this type of machinery.


Studies have shown tractors, mowers and other farm machinery can injure and kill bog turtles. (Wikipedia)

Barriers to Movement

Roads, railroad tracks, and other anthropogenic habitat alterations can serve as barriers to movement and cause entrapment for turtles (Aresco 2005, Kornilev et al. 2006, Pittman and Dorcas 2009). Presumably, perched culverts would prevent bi-directional use of streams as travel corridors. A telemetry study of bog turtles at a site in North Carolina led to the discovery of the death of a bog turtle in a puddle adjacent to a railroad track, with the authors proposing that the turtle perished due to difficulty with crossing the railroad tracks to get back to the bog (Pittman and Dorcas 2009). It is likely that anything within the landscape that is a barrier to movement or entraps bog turtles in place could increase stress, affect thermoregulation, and lead to death. Additionally, the isolation of populations due to barriers and loss of habitat limits gene flow and removes the benefits of a functioning metapopulation, which in turn makes them susceptible to local extirpations (Frankham et al. 2002, Pittman et al. 2011, Apodaca et al. 2012).

Disease

The possibility of disease having detrimental effects on the species is of great concern, especially given the small size of these populations. Although we do not have evidence of disease being a significant cause of declines in bog turtles, they have been documented with various diseases, including bacterial pneumonia in North Carolina and Virginia (e.g., *Pseudomonas* spp. and *Aeromonas* spp.), herpesvirus in wild turtles in the northeast, and mycoplasma in wild bog turtles (Carter et al. 2005; Ossibof et al. 2015; Erb 2019). Moreover, there is plenty of evidence of disease having detrimental effects on other turtle species (e.g., Turtle fraservirus 1 affecting multiple turtle species in Florida, Waltzek et al. 2022; mystery disease affecting the Bellinger River Snapping Turtle in Australia, Spencer et al. 2018; Helicobacter bacteria affecting gopher tortoises; Desiderio et al. 2021). Thus, it is important to monitor the health of bog turtles and conduct disease testing of sick or dead turtles. We must also be diligent with disinfection procedures to minimize chances of spreading disease during fieldwork activities. This is especially true due to the potential for the rapid spread of diseases via human movement around the globe.

> The largest bog turtle die-off ever documented in the state occurred in 2019 when more than 50 turtles were found dead. Despite extensive disease testing and investigations into other potential causes, biologists were unable to determine conclusively how the turtles died.

In 2019, we discovered the largest bog turtle die-off ever documented for the species in a North Carolina site, with more than 50 turtles found dead. Despite extensive disease testing (*Ranaviruses*, *Mycoplasma*, *Herpesvirus*) and investigations into other potential causes, including predation and toxins, the results were inconclusive. This die-off could have been a result of disease or toxins, increased stress and vulnerability due to drought conditions, or predation, or some combination of these causes. Similarly, a Health Bulletin published by the USFWS (2014) reported 14 bog turtles found dead at one site in May 2014 in Pennsylvania and outlined protocols for decontaminating gear and submitting specimens for testing (USFWS 2018). In the Pennsylvania case, test results did not indicate one causative agent, but a variety of potential factors include injury, infection, pneumonia, and carcinoma. The USFWS warns biologists to be aware and take necessary precautions.

Climate Change

Climate models predict various outcomes for North Carolina (DeWan et al. 2010, NCWRC 2015). For example, the timing, amount, and type of precipitation are expected to change, but precipitation predictions are unclear for North Carolina (NCWRC 2015). Some models indicate that the amount of precipitation may not change, but the intensity and duration of both storms and droughts will increase (NCDENR 2010, Schultheis et al. 2010, NCWRC 2015). When a drought occurs, the amount of suitable habitat in a bog can shrink and result in increased water temperatures, both potential stressors for bog turtles. The large bog turtle die-off in North Carolina in 2019 may have been partially due to drought conditions. The impacts of climate change have been documented in other turtle species, including the Murray River turtle and ornate box turtles (Spencer et al. 2018; Rodriguez et al. 2022).

Changes in storm intensity can increase the soil erosion potential and decrease the frequency of groundwater recharge (Karl et al. 2009). Intense rainfall events would likely flood many bogs, leading to scouring and head-cuts, and further increasing nutrient loads (NCDENR 2010). A study to predict effects of climate change on Southern Appalachian bogs indicated that future climates are likely to affect them through the combined impacts of temperature and precipitation (Schultheis et al. 2010). Dominant vegetation is likely to shift from sphagnum moss to woody shrubs because shrubs are better able to handle drought and higher nutrient levels (Schultheis et al. 2010). Thus, climate change may intensify the need for management. Likewise, invasive plants are likely to become increasingly prevalent in bogs as vegetation dominance shifts away from sphagnum (NCDENR 2010). Impacts from climate change may exacerbate many of the threats that bog turtles face, including altered hydrology, invasive species, disease, and increased predation.

Illegal Collection and Trade

Collection of turtles in North America for illegal trade has become a lucrative business. There are documented instances of many species of turtles being illegally harvested for the purpose of sale into the black market (Christy 2008; Todd et al. 2010; Sevin et al. 2022). There is evidence that people who seek to purchase wild-caught or captive-bred bog turtles as pets are not dissuaded by high prices (Turtle Survival Alliance pers. comm.; Grover Brown pers. comm.). Illegal collection of bog turtles poses a serious potential threat, although we do not know how often it occurs in North Carolina or which sites have been targeted in the past, with two exceptions. In 1989, a presumably large number of bog turtles was collected from two sites in Henderson County, and turtles were offered for sale in Ohio soon after (D. Herman pers. comm.). These populations have not yet recovered to their original abundance, and we attribute that, in part, to the loss of many breeding individuals to this collection event (NCWRC unpublished data). In 2006, a bog turtle was taken illegally in North Carolina and confiscated by law enforcement. A simulation model examining the impact of removal of one adult turtle per year indicated that the study populations in New York would be devastated by such loss and thus, anti-poaching measures would be warranted (Shoemaker 2011).

> A large number of bog turtles collected from Henderson County in 1989, and subsequently sold in Ohio, continues to have a detrimental effect on today's populations, due in part, to the loss of many breeding individuals collected.

Summary of Threats

Although all these threats likely impact bog turtles to some degree, the main threats are wetland vegetative succession, altered hydrology, wetland loss and degradation, increased predation, vehicles, and barriers to movement. However, each site is affected by the range of identified threats differently based upon proximate historic and current land uses, state of ownership, and other local conditions and should be considered and incorporated into any action plans. Threats to monitor closely include illegal collection and trade, disease, and invasive species because these could quickly result in devastating impacts. Climate change could have a large long-term negative impact, especially if wetland hydrology is altered, and it should be considered in all conservation planning for bog turtles and their habitat. Lastly, more research is needed to better understand how extensive these threats are and the most effective methods to address them.

CONSERVATION GOAL AND OBJECTIVES

Conservation Goal

The conservation goal for *Glyptemys muhlenbergii* is to protect and restore the populations and habitat of this species to prevent extirpation and ensure long-term viability across its current range in North Carolina for the next 100 years.

Conservation Objectives

A. Further our understanding of bog turtles by filling information gaps about distribution, improving knowledge of site-specific threats, monitoring status and trends, and conducting research to improve conservation outcomes.
B. Maintain existing populations and metapopulations and maximize the number of viable populations by working with partners to address site-specific threats through habitat management and restoration, population management, and habitat protection.
C. Expand outreach efforts by involving more collaborators and more effectively reaching landowners with a range of options that conserve bog turtles.

(Jay Ondreicka)

CONSERVATION ACTIONS

The following actions are all considered essential to meet the three conservation objectives listed on page 21 and efforts must be immediate and concurrent. These actions are equally important and not listed in order of priority.

Inventory, Monitoring, and Research

We have learned much about bog turtles in North Carolina over the last 40+ years, but specific knowledge gaps remain. We need to identify and survey for bog turtles at new locations that have a high potential for suitable habitat so we have a more complete understanding of the species' status and distribution in North Carolina. Likewise, we need to continue monitoring bog turtle status and trends at known sites. New survey and monitoring tools are being developed and we need to create a more robust monitoring plan that incorporates these and traditional survey techniques. Lastly, additional research is needed to address specific questions to inform management and conservation. All work will be conducted in a manner that minimizes negative impacts from the work itself. With regard to disease, we will use existing protocols for handling disease cases and preventing spread of parasites and pathogens from one site to another (e.g., SEPARC disease task team reports, Bog Learning Network Decontamination Protocols, Health Bulletins from the northern population of bog turtles). A full accounting of possible techniques for inventory, monitoring, and research can be found in the Partners in Amphibian and Reptile Conservation's Inventory and Monitoring Handbook (Graeter et al. 2012). To find turtles, we will use several visual and tactile active survey methods, as well as several passive methods, including trapping (Somers and Mansfield-Jones 2008).

Counting scutes (top left) and measuring shells (bottom left) of each individual turtle captured during surveys help biologists keep track of bog turtle status and trends at known sites. (Meliissa McGaw/NCWRC)

Fill Information Gaps about Distribution

Recently, through concerted efforts, NCWRC biologists, members of Project Bog Turtle, and others have found several previously unknown bog turtle populations, but there are likely more to discover. With limited time and resources, we have focused more effort on known populations and had less time to dedicate to surveying habitat with potential for bog turtles. Through GIS technology, use of small airplanes and drones, and outreach, we can focus on locations with high potential for bog turtles. Many small wetlands are not easily accessed or seen from public roads. Because bog turtles are cryptic and most humans are averse to getting deep into a muddy place, many landowners do not know they have bog turtles on their property.

Bog turtle populations can be discovered both on a small scale using aerial images to locate places with potential for bog habitats and on a larger scale by creating predictive GIS models to locate places with a high likelihood of having suitable bog turtle habitat (e.g., Stratmann et al. 2016). Layers that may go into these models include soil maps, topography, aspect, and LIDAR, among others. This model could also help locate bogs that need restoration and/or habitat management. Historical imagery is another valuable resource for researching the land-use history of a site, such as past efforts to ditch, drain, or pond a site, whether it was forested or open, and how the land cover has changed over time. It may also prove helpful to reach out to private landowners through news releases, newspaper articles, and through Natural Resources Conservation Service (NRCS) offices, especially in counties with extant populations, to encourage them to contact NCWRC and consider allowing us to survey wetlands on their property.

Lastly, we need to increase our on-the-ground habitat assessments and survey efforts to determine presence-absence and population viability at the locations identified as having high potential. It is important to have complete information of how many bog turtle populations exist, their geographic distribution, and their status. With this information, we can make more informed conservation decisions.

Wildlife Diversity Biologist Lori Williams sets a bog turtle trap. On-the-ground assessments and survey efforts will help NCWRC staff determine viable populations of this tiny turtle. (NCWRC)

Monitor Populations to Determine Status and Trends

Regular monitoring is important so we can continue, or in some cases begin, to assess the status of populations over time. Monitoring can detect positive or negative changes that occur in response to our efforts or other factors. Although NCWRC biologists and partners have monitored bog turtles for many years, the project would benefit from long-term strategic planning and a structured monitoring plan. Monitoring will need to be multi-faceted, where some populations have more intensive mark-recapture monitoring and others are monitored via site-occupancy or presence-absence (Graeter et al. 2012). Numerous methods should be included in a structured monitoring plan, from mark-recapture and conventional trapping to newer techniques such as camera traps and eDNA. We also need to gain a better understanding of detectability of bog turtles in North Carolina's varied bog habitats.

Conduct Research to Improve Conservation of Bog Turtles

Research is needed on multiple topics to better understand the ecology, habitat use, and appropriate habitat management actions to implement. We must identify limiting factors of declining populations so conservation actions are targeted and effective. In addition to identifying major threats to bog turtle survival, NCWRC and partners will evaluate the success of conservation efforts. Adaptive management will be important for refining and improving conservation actions and outcomes.

Some prioritized research topics we need to address are listed below, but this list is not exhaustive, nor is it in order of priority. As we learn more and begin working toward the objectives in this Plan, different questions may arise that need to be answered.

1. **RECRUITMENT**: Demographic research to determine life stages that are limiting factor(s) to population stability or growth.
2. **ADDRESSING THREATS**: Improve understanding of which threats are playing significant role(s) in which populations, and which management actions may be most effective and economical to address these issues.
3. **POPULATION MANAGEMENT and DECISION MAKING**:
   1) Develop a predictive population model that aids conservation and management decisions.
   2) Using different population management techniques, including population augmentation via head-starting, investigate differences in survivorship of turtles.
   3) Conduct genetic studies to determine gene flow and population health and to guide population management actions such as reintroductions, augmentations, relocations, and captive-breeding.
4. **HABITAT USE and MANAGEMENT**:
   1) Examine efficacy of different vegetation management techniques, such as grazing studies focused on evaluating the ideal density and timing of grazers, effects of grazing on bog turtle detectability, and if (and under what conditions) bioturbation improves habitat.
   2) Improve understanding of landscape ecology and metapopulation dynamics.
   3) Improve understanding of bog hydrology (e.g., variation between bogs, inter- and intra-annual differences, influence of disturbances and management, relationship of bog hydrology to habitat use) and water quality (e.g., baseline conditions, effects of agriculture and development).

4) Conduct occupancy modeling to determine what qualifies as suitable habitat and adequate habitat size.

5) Bog turtle ecology: 1) Examine differences in food availability across bogs, 2) Study overwintering locations and determine if they are limiting.

5. **SURVEY/DATA COLLECTION METHODS**: Estimate detection probability, including (but not limited to) individual detectability, site-specific estimates, survey methods, and effect of different habitat features (e.g., vegetation structure and composition, soil saturation, microtopography, wetland size).
6. **BOG TURTLE HEALTH**: Conduct baseline health assessment. Identify diseases and health issues that may affect bog turtles.
7. **CLIMATE CHANGE**: Investigate effects of climate change on bogs (e.g., hydrology, vegetation, resiliency of bogs over long-term) and bog turtles.

Habitat Management and Restoration

Although the habitat at some bog turtle sites appears to require little effort to maintain, this is certainly the exception. Many of the bog turtle sites that appear to have the most robust populations have had some form of repeated disturbance that maintained open areas. Many factors that are believed to have kept some wetlands open historically are gone or diminished, such as bison, elk, beavers, and natural fire or fires set by American Indians (NCWRC 2015).

NCWRC staff will collaborate with partners to evaluate needs and develop and implement adaptive management plans for bog turtle sites, prioritizing state-owned sites and others that have complex and immediate management needs. The full suite of management and conservation tools that are available will be considered in development of these plans. Habitat management tools to be considered include mechanical removal of vegetation, treatment of invasive species, addition of desirable native plants, prescribed fire, use of grazers/browsers (e.g., cattle, goats, bison), hydrologic restoration (e.g., plugging ditches, fixing head-cuts, breaking up drain tiles, removal of fill dirt), co-existing with beavers when possible, creating turtle passages, and any other management tool that helps staff accomplish objectives. The habitat, land-use history, and threats that each population faces are site-specific, and thus, different tools and techniques will need to be appropriately applied. These plans will need to be adaptive and allow for flexibility when ecological conditions and/or threats to a population change.

One habitat management tool biologists can use is mechanical removal of vegetation; however; however, habitat management tools are site specific and depend on the habitat, land-use history, and threats that each bog turtle population faces. (NCWRC)

As these management plans are developed, mapping of known and desired features and sensitive areas (e.g., erosion, rare plants), and consultation of the scientific literature, will be crucial in determining the most appropriate management technique to use (e.g., grazers, mechanical vegetation removal, prescribed fire). NCWRC staff will establish a prioritized schedule for habitat management of all extant bog turtle populations. Staff will identify needs related to that schedule, including staff capacity, partners, budgets, funding, and anything else required to carry out a management plan. After habitat management has been conducted, NCWRC staff will evaluate the management efforts through subsequent population and habitat monitoring. Furthermore, this will require a system of tracking management actions taken at each site to ensure effective adaptive management and accurate accounting of site histories.

Vegetation Management

The aim of vegetation management is to create and/or maintain high quality habitat for bog turtles. One method of setting back vegetative succession is to enter the bog on foot and use hand-held equipment, such as chainsaws, loppers, clippers, and hand saws to mechanically cut and then remove woody vegetation. Vegetation management may also include the addition of native plants to improve habitat, to fill a void when non-native invasive plants have been removed, to add structure when no shrubs are present within a bog, or to minimize erosion when restoration efforts have resulted in bare soil areas. Botanists in the N.C. Natural Heritage Program and members of the Bog Learning Network will be consulted to establish an appropriate plant list, considering the likelihood of each species to occur naturally on the property and the propensity of a species to spread invasively, among other factors.

(Shutterstock)

Vegetation management may also include the addition of native plants to improve habitat, such as sphagnum moss (top) and bulrush (bottom).

(University of Mississipi Field Station)

NCWRC staff and partners often document the presence and general abundance of non-native invasive species at sites. Because some invasive plant species can form monotypic stands and affect habitat suitability, we will incorporate treatment and removal of invasive species into Management Plans. When an invasive plant species that significantly alters bog turtle habitat (e.g., reed canary grass, purple loosestrife) is found, we will respond rapidly with treatment before it spreads further. The goal for some invasive plant species may be elimination. For other invasive plant species, elimination may be unrealistic goal; therefore, the focus will

be on control and reduction. NCWRC staff should be prepared to increase the frequency of management activities targeted at woody stems and invasive plants, because these are likely to fare better under most predicted climate change scenarios. We should also determine a treatment plan in preparation for the potential discovery of fire ants at a bog turtle wetland.

Prescribed fire can be used in some cases as a vegetation management tool, but managers should proceed with caution as very little is known about its ecological effects within bogs. Prescribed burning has been used minimally for vegetation management in bog turtle habitat and it is most appropriate when used in conjunction with other management techniques. In fact, there are very few studies that have investigated the role of fire in wetland ecosystems in general (Osborne et al. 2013). We do not know the role or extent to which wildfires in precolonial times would have helped slow succession in bogs. In some bogs, a fire may not be able to burn across the bog due to too much moisture and/or a lack of material to burn. At other sites, it may be able to burn across the wetland under ideal conditions and be a useful management technique. Research is needed to understand better the ecological effect and utility of this method, and to determine general guidelines for using prescribed fire in bogs. Consultation and collaboration with NCWRC Land and Water Access staff and other partners will improve adaptive management using prescribed fire.

Prescribed fire can be used in some cases as a vegetation management tool, but managers should proceed with caution as very little is known about its ecological effects within bogs. (NCWRC)

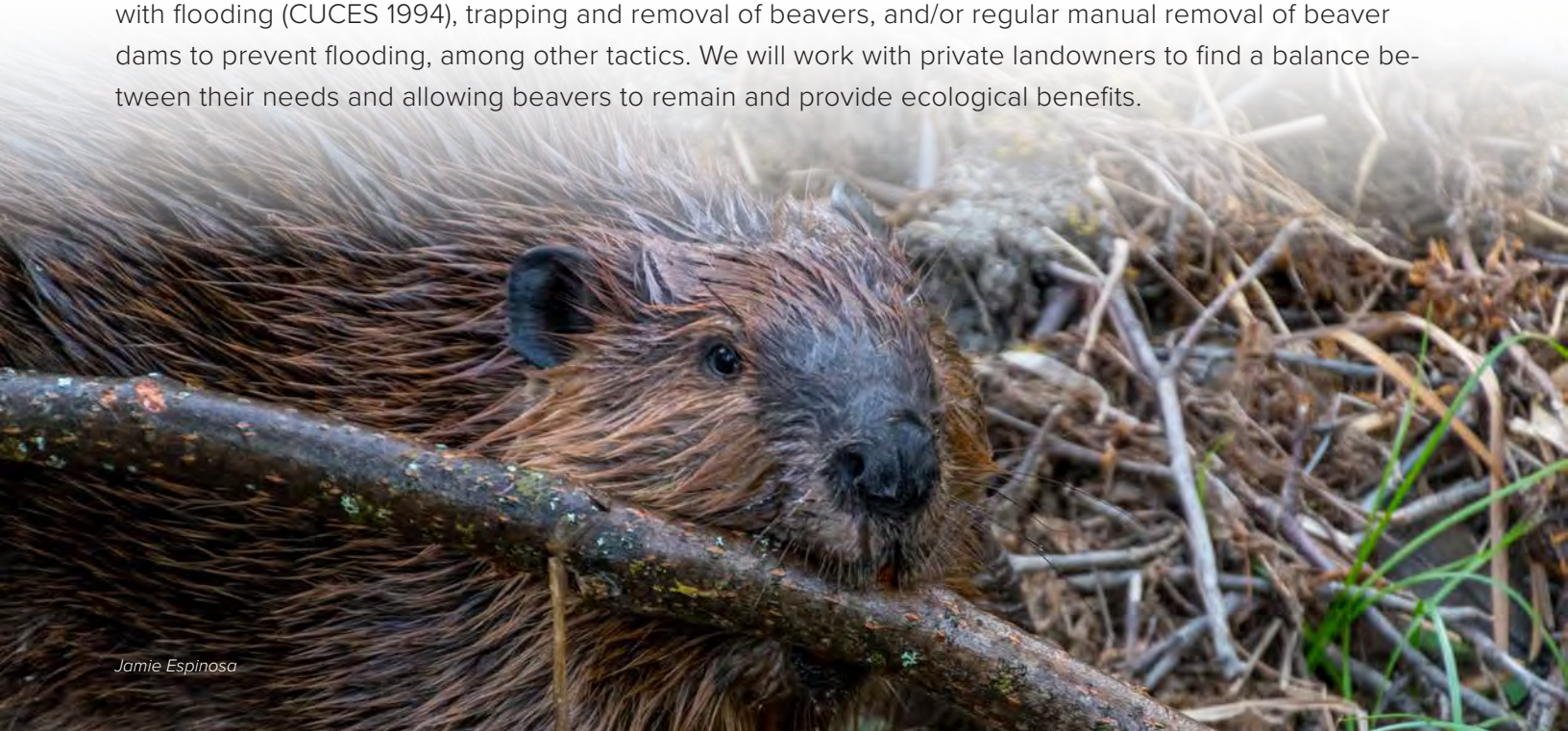
Grazing is another technique available to aid vegetation management at bogs. We will take a site-specific approach of weighing the risks and benefits before deciding whether grazing is suitable and if so, at what intensity. In many bogs with a history of grazing, low and moderate intensity grazing is beneficial to maintaining relatively open habitat (Tesauro 2002, Tesauro and Ehrenfeld 2007, USFWS 2019). Moreover, Tesauro and Ehrenfeld (2007) found higher population abundances and densities, and more juvenile bog turtles in grazed sites. Grazing is an important tool for managing many bog turtle sites and while there are some risks, benefits of light to moderate intensity grazing typically outweigh potential risks. At sites with no history of grazing, and/or when the plant community and/or topography of a site is deemed too sensitive for grazers, we will use other habitat management techniques. Whenever appropriate and feasible, NCWRC staff will use grazing at sites with a history of grazing so they can continue to provide suitable habitat for bog turtles. When possible, NCWRC staff will accomplish grazing treatments via agreements with appropriate terms and conditions, including species, breed, duration, timing, and areas to exclude. When NCWRC biologists have determined that grazing is a desirable technique for a given site, we will take steps to ensure the grazing intensity is adequate to meet conservation goals but not excessive. We will consult recommendations from the USFWS (e.g., USFWS 2019, Appendix H) and peer-reviewed articles to guide decisions about grazing, and work with willing landowners to schedule the appropriate amount of grazing in the wetland,

especially during the bog turtle nesting season (June 1-September 30). We will consider installing temporary or permanent fencing that makes it possible to limit grazing in known or suspected nesting areas during and after nesting each year. Conservation partners such as USFWS and NRCS may be able to assist with funding and implementation.

Hydrology Management and Restoration

Many of restoration needs of wetlands with bog turtles include hydrology. Most wetlands have experienced human influence involving an attempt to minimize the wetland extent and increase rate of drainage out of the wetland area, including ditching, installing drainage tiles/pipes, and filling wetland areas (Biebighauser 2007). Much of this work was done to improve agricultural and pasture lands. Landowners have also taken advantage of the constant flow of water from springs in the wetlands and created ponds on their property where bogs existed. To restore hydrology, we are often attempting to reverse past efforts by removal and/or breakage of drainage tiles and other similar drainage materials, filling or plugging old ditches, and removal of fill dirt (Biebighauser 2007). Other hydrological restoration actions include addressing problems with head-cut erosion within or adjacent to the wetland, restoration of streams adjacent to bog, addressing problematic flooding, and activities to improve natural movement of water within a wetland. Restoration can also occur by allowing a ponded area to fill slowly over time so it becomes a bog.

In a relatively unaltered landscape and watershed, beaver activity helps bog turtles because it keeps some sections of a wetland complex open with mostly herbaceous and shrubby vegetation, and areas are periodically flooded and opened back up so there is always some suitable habitat for bog turtles. Bog turtles are adapted to adjust their habitat use based on changing hydrology (Sirois et al. 2014, McCoy 2016). A geomorphic study of a bog with extensive beaver activity in western North Carolina indicated that the wetland has existed since the terminal Pleistocene, although it has changed in form over time (McDonald 2010). If habitat is limited and beavers are causing damage to bog turtle sites, we will determine best action(s) to take, which may include using devices such as the Clemson Pond leveler to reduce problems associated with flooding (CUCES 1994), trapping and removal of beavers, and/or regular manual removal of beaver dams to prevent flooding, among other tactics. We will work with private landowners to find a balance between their needs and allowing beavers to remain and provide ecological benefits.



Jamie Espinosa

Habitat Connectivity

We will form a working group to address issues associated with roads and other barriers to movement and determine a multi-faceted plan. An important partner in this working group will be the N.C. Department of Transportation (NC DOT). To decrease road mortality of bog turtles, fencing and turtle passages under roads to allow safe subterranean movement can be built when resources allow. In some cases, existing culverts and bridges may be retrofitted to improve connectivity and decrease mortality of turtles on roads.

Broader Habitat Efforts

While management and restoration work should be prioritized at important bog turtle sites, work at other sites is important to increase species viability and habitat connectivity. Bog turtle sites with highly degraded habitat, habitat with historic records, and locations within the bog turtle range that lack bog turtles but have the potential to be high-quality habitat, should be targeted for restoration whenever feasible. Restoration work may include sites that need significant changes due to past land-use activities such as ditching, drainage, filling, and other soil movement activities. Sites that are within a metapopulation should be given additional attention in planning and management activities to enhance landscape connectivity and potential for movement between populations. Even when a wetland in a metapopulation does not have records of bog turtles, those habitats should be managed and restored whenever possible with bog turtles' needs in mind. There may also be opportunities to create habitat in high-priority watersheds and metapopulations. These actions will consider the existing plant community with the aim of improving habitat for other wildlife and rare plants. Wetlands that are not occupied by bog turtles now may be colonized in the future or used periodically during movements across the landscape.

(Mike Knoerr)

NCWRC staff will collaborate closely with partners and private landowners to accomplish habitat management and restoration. Partners will include agencies with programs that facilitate habitat management to benefit bog turtles on private property, including the NRCS and USFWS. Such habitat management may also help reduce agricultural runoff into wetlands. To improve management and restoration decisions related to bog hydrology, NCWRC staff will partner with hydrologists, soil scientists, and other wetland experts. It is also essential that we continue to nurture good relationships with private landowners and expand these efforts to optimize bog turtle conservation on these lands (see Outreach section).

Population Management

To help this species persist under the pressure of so many threats, we must employ multiple conservation tools simultaneously (Crawford et al. 2014). The NCWRC and partners are focusing on the importance of adequate quality habitat and addressing other threats, but some populations are so small that we need additional techniques to help give them a boost in numbers. Population management methods will be used simultaneously with many other conservation activities, including habitat management and restoration, threat abatement from predators and road mortality, and others. We need to use these population management techniques to buy some time to avoid losing these populations while we are addressing other issues. It is also possible that past events have reduced populations to such low numbers that recovery without a boost in numbers may be impossible given ongoing low-level threats such as loss of adults to road mortality, flooding due to climate change, and reduced wetland size due to overland flow of sediment during storms.

> The objective of bog turtle population management is to increase the number of viable populations, maintain existing genetic diversity, and create Resiliency, Redundancy, and Representation (USFWS 2016) of the species throughout its range in North Carolina.

NCWRC staff and permitted partners should continue with in-situ population management techniques, such as protecting nests and hatchlings from predation and other threats, whenever necessary and likely to be effective as resources allow. Nest failure has multiple potential causes, including predation, inundation from flooding, getting crushed, and in some cases, these can be addressed in-situ. When increased predation is identified as a threat to a bog turtle population, an action plan should be devised. Although predation is a part of the ecology of bog turtles, predators can be at higher abundance due to human subsidies and some turtle populations are in such peril that action is needed. When adult and juvenile survival rates are lower, which is the case in NC (Tutterow et al 2017; Knoerr et al 2021), and the threat cannot be addressed directly or quickly (e.g., road mortality, diminished hydrology conditions), increasing nest survival can help mitigate population declines until the root causes of low age-class-specific survivorship rates can be managed. One way to directly influence the bog turtle population at a site is through various types of in-situ activities to protect nests and turtles from predators or other threats, such as use of electric fences surrounding a wetland and/or a nesting area, use of predator excluder cages over nests during incubation, and removal of meso-predators through trapping or other means (Macey 2015; Zappalorti et al. 2017; Knoerr 2018). Predator removal is not always appropriate and may not be effective in some situations. It will be necessary to monitor the situation after taking action to see if the problem has been addressed fully or whether the plan needs to be adapted. In some instances, these efforts to protect hatchling and yearling bog turtles from predators may also extend benefits to older juveniles and adults. Moving nests to safer locations (Burke 2015) is another technique used to improve nest success in situations where flooding is likely or other threats exist in a portion of a site.

To recover bog turtles in North Carolina and avoid extirpation, NCWRC should continue to expand our ex-situ population management activities. These tools include, but may not be limited to, population augmentation (at sites with extant populations), repatriation (to sites that historically had the species), and population introduction (with no record of the species in past), through various means including ex-situ egg incubation, head-starting, translocation, and captive breeding. Population management techniques, such as population augmentation through head-starting, offer a direct route to restoring Resiliency and Redundancy and bolstering populations. A bog turtle population in Tennessee was established via captive-breeding and head-starting over a 30+ year period, with successes including an 84% survival rate, relatively high genetic variation, and the recent discovery of several nests and hatchlings on-site (Dresser et al. 2017; Zoo Knoxville unpublished data).

NCWRC biologists recently completed a small short-term (2-year) head-starting effort at a NCWRC owned site in North Carolina with Zoo Knoxville to develop and refine our procedures and methods. Recent studies of freshwater turtles have concluded that these types of initiatives are valuable tools to address recruitment problems, increase turtle numbers, and stave off extinction threats (Spinks et al. 2003; Kuhns 2010; Riley and Litzgus 2013; Buhlmann et al. 2015; Spencer et al. 2017). Importantly, modeling has shown that population management efforts, especially head-starting, can help stabilize declining North Carolina bog turtle populations (Knoerr et al. 2021).

Head-starting efforts on bog turtles could be a valuable tool to address recruitment problems, increase turtle numbers and stave off extinction threats. (Mike Knoerr)

For these ex-situ population management activities, we will collaborate with conservation partners and experts to develop an objective, science-based decision framework that will help guide decisions for population management with this species in North Carolina, similar to a reintroduction program for Blanding's turtle (*Emydoidea blandingii*; Buhlmann et al. 2015). Given how dire the situation is (see *Distribution and Population Status* section), until this decision framework is developed, it is imperative that we act now and begin using these population management techniques using the best, current information and adapt as we learn more in the future (i.e., adaptive management). Depending on the situation at a given site, the objective of using population management may vary, ranging from buying time while other threats are addressed, increasing genetic diversity, to helping a population become viable and stable.

Examining conservation genetic parameters, such as genetic diversity, inbreeding level, and bottlenecks, is important to bog turtle population management. Because long-range movements are rare and difficult to document in bog turtles (Shoemaker and Gibbs 2013), exploring genetic patterns will give us a broader landscape scale perspective for this species. Landscape scale genetics can also help us infer metapopulation factors, such as rates of migration, effective population sizes, and indices of inbreeding. Results can inform conservation decision making as it pertains to landscape features that may inhibit or enhance

migration (Apodaca et al. 2012). Both the genetic parameters and metapopulation factors are valuable for decision-making about the use of potential population manipulation techniques. A genomic assessment can also be a useful tool for examining the success of a population management program at a site, such as introduction of bog turtles to a novel location (Dresser et al. 2017).

We will develop requirements for facilities involved in handling or holding turtles for population management purposes (e.g., secure from illegal collection, ability to follow protocols for rearing/head-starting, disease concerns, genetic concerns). NCWRC has developed a partnership with Zoo Knoxville for incubation and head-starting of bog turtles, but it may be necessary to explore additional partnerships, and/or use NCWRC facilities for rearing and head-starting North Carolina bog turtles. We will also work with conservation partners to establish a detailed plan for each site, including goals, methods, and a monitoring protocol for evaluating population management efforts at each site over time. We will continue our mark-recapture efforts using several survey methods. As part of this monitoring plan, we will establish measures of success and the time scale at which they can each be evaluated. Furthermore, we will develop NC-specific genetics guidelines on the use of these population management techniques. NCWRC biologists will work closely with a variety of experts to help make optimal conservation decisions about population management for bog turtles in North Carolina.

Land Protection

While portions of some bogs have permanent land protection and a few bogs are protected entirely, most sites are in private ownership and lack permanent land protection, which puts them at risk to ditching, draining, ponding, and filling activities. Additionally, it has become apparent through bog conservation efforts over the years, that protecting the watershed of the bog, or “bog-shed,” including underground aquifers, is important and in some cases critical to addressing the threat of altered hydrology. Land protection can minimize heavy equipment in or near bogs, address road mortality issues via installation of road crossings, and reduce the risk of further habitat fragmentation, etc. Without some form of land protection, all other efforts for the population and its habitat may be in vain because the habitat can be destroyed in a day via activities such as ditching.

Land protection may take many forms, from ownership by a conservation entity, a permanent conservation easement, registration under the NCNHP Registered Natural Area program, as well as temporary protection through programs such as the Wildlife Conservation Land Program (WCLP) with NCWRC or farm bill programs with USDA NRCS. Partnerships with non-governmental conservation organizations are essential for many reasons, including their skills in grant writing and working with landowners, as well as their ability to purchase property quickly. Short-term protection programs do not lend the degree of protection that conservation ownership or a permanent conservation easement provide, but they are important tools to have in the conservation toolbox for working with private landowners to aid land protection and improve stewardship of the habitat. See the Outreach section on page 34 for more information on short-term protection of habitat on private lands.

Of the 65 wetland sites with at least one bog turtle captured in the last 20 years (2001-2020), more than half (34) are not protected (i.e., under conservation ownership or easement). Of the 23 sites that have had 10 or more individual turtles captured over the last 20 years, only 12 have permanent land protection, leaving the remainder (11) without any protection. Our strategy will involve collaborating with the Bog Learning Network's Protection Committee to enhance their site-specific planning actions, coordinating with our conservation partners, and reaching out to landowners about protection options and incentives. When conservation agreements and easements are created, we will ensure that the language in the easement document allows for appropriate management of the bog turtle habitat.

Protecting the wetland is the first priority, but NCWRC will also strive to protect the land immediately surrounding the wetland, the watershed of the wetland, the land and streams between wetlands, and any other lands and wetlands that would benefit the bog turtle population or metapopulation. Protecting the watershed is critical. The value of watershed protection is acknowledged in the Mountain Bogs National Wildlife Refuge Land Protection Plan and Final Environmental Assessment as one of the four factors used in delineating Conservation Partnership Areas (USFWS 2014). Key components of watershed protection are inclusion of riparian buffers, minimization of impervious surfaces, and limiting activities that involve water extraction. Further, protecting the landscape surrounding bogs will lessen impacts of intense rainfall events via water infiltration and will attenuate runoff concerns as climate changes. Protecting the surrounding landscape of a metapopulation will help maintain or improve movement corridors, habitat connectivity, and gene flow. NCWRC staff, land trusts, and other conservation partners such as NRCS will play a critical role in developing relationships with additional landowners and developing an educational campaign in communities closest to these metapopulations.

Protecting the wetland and surrounding land will help maintain and improve bog turtle movement corridors, habitat connectivity and gene flow. (USFWS)

Outreach

We have a strong network of collaborators and solid relationships with many private landowners, but more needs to be done. NCWRC's involvement needs to expand to an agency-wide effort, we need to work with additional key partners, and we need to have a more robust outreach program to landowners. These actions would bring increased funding, programs, private landowner involvement, and protection of the species, thereby making a significant difference in the conservation of bog turtles.

Increased Collaboration

Collaboration efforts at the Agency level should be focused on the variety of opportunities multiple divisions can contribute to bog turtle conservation. Staff expertise exists within the Wildlife Management, Wildlife Education, Land and Water Access, Law Enforcement, Engineering, and Communications, Marketing and Digital Engagement divisions. For example, the Wildlife Management Division's Operations Program can assist with landowner education and outreach as well as identification of new bog locations, and program biologists can develop and disseminate tools and incentives that get landowners more engaged in practices that benefit bog turtles. The Land and Water Access staff's expertise in habitat management is integral to habitat management efforts on NCWRC-owned bogs, and the expertise of staff from Engineering will help develop and conduct wetland restoration projects beneficial to bog turtles. The Wildlife Education and Communications, Marketing, and Digital Engagement divisions can help develop and implement stronger education and outreach programs focusing on bog turtles and bogs. However, increasing directed efforts toward the conservation needs of this species could require additional personnel resources or a reprioritization of activities.

Staff from the Wildlife Management and Law Enforcement divisions should collaborate and share information on mountain bog ecosystems and bog turtles and enhance efforts to educate the public about the importance of protecting these habitats and species. Specifically, Division of Wildlife Management staff will work closely with law enforcement officers who have bog turtle populations in their districts, so they can focus antipoaching efforts as needed.

Building relationships with entities that can provide habitat management and land protection assistance to landowners, including NRCS and land trusts, will continue to be important to long term conservation. Cooperative work with NRCS staff to identify possibilities and encourage interest in new programs and funding designed for bog turtle conservation will continue. Agency staff can provide educational programs for NRCS staff regarding mountain bogs and bog turtles. Opportunities may exist through current NRCS incentive programs for private landowners, such as the Wetlands Reserve Easement (WRE) program and Environmental Quality Incentives Program (EQIP), as well as future NRCS programs. Agency staff currently maintain strong relationships with many land trusts in the region and further steps to strengthen relationships with land trusts that have not been as active in bog turtle conservation efforts should be considered.

A need exists to improve communication with staff at organizations and businesses that may impact known and potential bog turtle wetlands. For example, Utility Right-of-Way managers (e.g., Duke Energy, Tennessee Valley Authority) often unintentionally use management techniques that damage bogs and bog turtles. Agency staff should develop and disseminate information that will provide alternative management techniques that will not harm bog turtles and alter habitat, and maintain open communication with managers. Finally, efforts toward expanding our conservation partners' understanding of the risks of poaching and the importance of safeguarding location information is paramount.

Work Closely with Private Landowners

In collaboration with partners, NCWRC staff will develop and implement an effective outreach and education program that is designed for both the public and for landowners within the range of the bog turtle who have wetlands on their property. We will work with Wildlife Education and Marketing staff to develop an outreach strategy to gain awareness, compassion, and support for bog turtles and their habitat. We also need to identify strategies to help maintain existing relationships and consider how to reach additional private landowners. Due to the time-consuming nature of maintaining landowner relationships and providing meaningful education and outreach, we need to increase NCWRC staff capacity to meet this need better.

Working closely with private landowners is paramount to our success in studying, managing, and protecting wetlands that bog turtles inhabit. We need to expand our outreach, guidance, and assistance for private landowners to encourage them to manage their property with bog turtle conservation in mind. We need to identify, develop, and implement incentive programs for landowners to implement habitat management practices (e.g., fencing rental program, NRCS programs such as Working Lands for Wildlife, USFWS Partners for Fish and Wildlife, WCLP). These programs can provide money to willing landowners to reduce their tax burden and contribute funds to do projects on their land. State Wildlife Grants also yield benefits to interested landowners because their wetlands may be managed at no cost to them. We must also provide tangible and helpful guidance on how best to manage their properties and what conservation programs are available to them.

Working closely with private landowners is paramount to the success in studying, managing, and protecting wetlands that bog turtles inhabit. (Jeff Hall)

This guidance includes determining products (e.g., information packet, brochures) and/or educational programs that are needed. Project Bog Turtle and the USFWS each have some materials that may be useful, but they need to be updated. For example, one product would be to develop "bog turtle best management practices" to educate landowners (e.g., use of livestock, mowing/bush-hogging practices, pesticide and fertilizer use, feral pets) with the aim of improving bog turtle habitat and minimizing habitat loss and injuries or death of turtles. Likewise, when private landowners express an interest, we can assist by developing management plans for their property.

Regulations and Enforcement

The bog turtle was listed as Threatened in 1997 by the USFWS and has been listed in CITES Appendix I (Convention of International Trade in Endangered Species) since 1975. However, the Threatened by Similarity of Appearance designation for the southern population limits some protections afforded by the Federal ESA, including incidental take. In North Carolina, take or possession of this species without a valid permit is currently prohibited under NC law and administrative code (15A NCAC 10I .0102) and is considered a Class 1 misdemeanor (§ 113 337b). We will address threats from illegal collection by continuing and expanding training and communication with enforcement officers and land managers. All sites should continue to be monitored for illegal activity through the use of targeted patrol and remote cameras by Wildlife Law Enforcement Officers. We will work with state and federal enforcement officers to increase surveillance at sites deemed most vulnerable to illegal collection. We will also follow the progress of larger turtle poaching groups such as the Collaborative to Combat the Illegal Trade in Turtles and will implement guidance developed by these groups.

Reviews of permit applications (e.g., NCWRC, USFWS) and enforcement of current regulations (e.g., Section 404 of the Clean Water Act) protect bogs from further destruction and degradation (e.g., filling, ditching, flooding to create ponds). However, the Clean Water Act protects jurisdictional wetlands from filling or draining, but small wetlands, including many bogs, are not protected and most agricultural activities are exempt from these restrictions. NCWRC biologists will provide conservation recommendations during reviews of permit applications that will reduce negative impacts to bogs, including reduction of stormwater runoff, decreased impermeable surface area, and support of measures that increase infiltration into the groundwater.

Summary of Actions Needed

The Conservation Actions needed to recover bog turtles are numerous and reflect the wide range of threats the species faces. Central to this long list are surveys and monitoring that are critical to continue assessing populations, discovering new populations, evaluating site-specific threats, and evaluating the success of conservation actions taken in an adaptive management framework. These core actions provide the foundation for targeted, intensive research that is needed to provide the information necessary to make decisions about the most effective conservation actions for specific populations. Some sites or populations may only need vegetation management to ensure population viability, whereas many others could require working with NCDOT, enforcement, implementing hydrologic restoration, population management, subsidized predator trapping, outreach, land protection or landowner technical guidance, and many other actions. It may seem overwhelming considering the site-specific nature of the threats and conservation actions needed to address those threats, but by prioritizing populations and conservation actions through the development of management plans and addressing threats in a timely manner, progress is being, and will continue to be made recovering bog turtle populations in North Carolina.

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GLOSSARY

Bioturbation: The reworking of soils and sediments by animals or plants.

Captive-breeding: The process of breeding animals in controlled environments by experts within well-defined settings, such as wildlife reserves, zoos, and other commercial and noncommercial conservation facilities.

Conservation easement: A conservation easement is a restriction placed on a piece of property to protect specific resources. The easement is either voluntarily donated or sold by the landowner and constitutes a legally binding agreement that limits certain types of uses or prevents development from taking place on the land in perpetuity.

Conservation ownership: When a property is owned by a government agency focused on conservation (e.g., NPS, USFS, NCWRC, NC Parks) or a conservation NGO (e.g., land trust, The Nature Conservancy).

eDNA: Environmental DNA is organismal DNA that can be found in the environment. Environmental DNA originates from cellular material shed by organisms (via skin, excrement, etc.) into aquatic or terrestrial environments that can be sampled and monitored using new molecular methods.

Extirpation: Local extinction or extirpation is the condition of a species (or other taxon) that ceases to exist in the chosen geographic area of study, though it still exists elsewhere. Local extinctions are contrasted with global extinctions.

Fecundity: The actual reproductive rate of an organism or population, measured by the number of gametes (eggs), seed set, or asexual propagules.

Fee-simple purchase: A fee-simple purchase transfers full ownership of the property, including the underlying title, to another party.

Fertility: The quality of an organism's ability to produce offspring, which is dependent on age, health, and other factors.

GIS: A geographic information system (GIS) is a system designed to capture, store, manipulate, analyze, man- age, and present spatial or geographic data.

Head-starting: The act of rearing wild hatchlings in protective enclosures before release at less susceptible size/ age, thereby avoiding the heavy mortality of young age classes in the wild.

High-quality habitat: This habitat is of adequate size and has the components of "suitable habitat," plus the following characteristics: areas with deep, loose, low-strength soils (Feaga et al. 2013), 2) presence of sphagnum mosses, rushes, sedges, and some wetland shrub species, 3) mosaic of low and shrubby vegetation with one or more relatively large areas with very low vegetation (ideally sphagnum, but also rushes and sedges) that receive full sun, 4) relatively unaltered hydrology with stable groundwater levels that are 8 cm ± 1 cm (3.1 in ± 0.4 in) average depth from sur- face over multiple years, without flooding and inundation

(Feaga 2010), 5) presence of subsurface root structures and/or tunnels, 6) adequate vegetation to conceal turtles when basking on surface, 7) minimal threats within habitat and/or adjacent to property (e.g., busy roads, overabundance of predators).

Hydrology: The science dealing with the properties, distribution, and circulation of water on and below the earth's surface and in the atmosphere.

Invasive species: Is a species 1) that is non-native (or alien) to the ecosystem under consideration and 2) whose introduction causes or is likely to cause economic or environmental harm or harm to human health. Land Protection: Permanent protection of a piece of property through fee-simple purchase, donation, or a conservation easement.

LIDAR: This term stands for "Light Detection and Ranging" — a remote sensing method that uses light in the form of a pulsed laser to measure ranges (variable distances) to the Earth.

Mesocarnivore: an animal whose diet consists of 50–70% meat with the balance consisting of non-vertebrate foods which may include insects, fungi, fruits, other plant material and any food that is available to them.

Mesopredator: Mesocarnivore that is often outcompeted by top predators such as wolves and cougars but can become the dominant predator in ecosystems where top predators are absent.

Metapopulation: Consists of a group of spatially separated populations of the same species that interact at some level.

Mountain bogs: See "Southern Appalachian Bog".

Mycoplasma: Any of numerous parasitic microorganisms of the class Mollicutes, comprising the smallest self-reproducing prokaryotes, lacking a true cell wall and able to survive without oxygen.

Occurrence record: A location with a record of a bog turtle is an occurrence.

Population: A group of bog turtles that interact and share the same habitat.

Population Augmentation: The addition of animals to an existing population, usually a small population that has habitat that can support a larger population that has not been expanding on its own due to impacts from threats, stochastic events, or demographic limitations. Animals can be translocated from a source population or may be added through captive breeding or head-starting of individuals that originated at the site.

Population Introduction: The intentional movement and release of animals to a location with no prior records of bog turtles (within or outside the species' range).

Population Management: Refers to population augmentation, population repatriation, and population introduction via various methods, including but not limited to head-starting, captive rearing, and translocation.

Population Repatriation: The intentional movement and release of animals to a site that historically had bog turtles.

Ranavirus: *Ranavirus* is a genus of viruses in the family *Iridoviridae* that includes viruses that are infectious to amphibians and reptiles.

Recruitment: Occurs when juvenile organisms survive to be added to a population, by birth or immigration — usually a stage whereby the organisms are settled and able to be detected by an observer.

Restoration: An intentional activity that initiates or accelerates the recovery of an ecosystem with respect to its health, integrity, and sustainability.

Site: A location that harbors a bog turtle population. It could be composed of one wetland with a population or a complex of wetlands in close proximity.

Southern Appalachian Bog: Includes open, acidic, permanently saturated wetlands of flat stream bottoms or gentle slopes, with a distinctive bog flora, with varying amounts of shrubs and sometimes with moderate amounts of tree cover, but with a well-developed, dense herbaceous layer and, generally, extensive Sphagnum cover. These wetlands generally appear to have a substantial amount of groundwater input, and therefore would be considered poor fens.

Suitable habitat: Habitat composed of the following at a minimum: 1) soft, saturated soils, 2) spring-fed hydrology, and 3) an area with low vegetation (no canopy) that gets full sun.

Threatened due to Similarity of Appearance: A species that is threatened due to similarity of appearance with another listed species or the same species in another geographic area and is listed for its protection. Species listed as T(S/A) are not biologically endangered or threatened and are not subject to Section 7 consultation with USFWS.

Viable Population: A population will be considered viable if it is estimated to have 1) at least 15 individual female adult turtles found within past 10 years (Shoemaker et al. 2013) AND all age classes have been observed in the past 10 years (eggs, hatchlings, juveniles, and adults). If enough data exist to assess population status, the population must also be stable or increasing, rather than in decline. We propose the following categories related to viability: non-viable, unknown viability, potentially viable, and viable.

Watershed: A drainage basin or 'catchment area' is any area of land where precipitation collects and drains off into a common perennial body of water, such as a wetland or stream.

NORTH CAROLINA WILDLIFE RESOURCES COMMISSION

WILDLIFE DIVERSITY PROGRAM

ncwildlife.org/WDP

Mike Knoerr

EXHIBIT M-2

SOUTHERN HOGNOSE SNAKE
CONSERVATION PLAN for NORTH CAROLINA

July 13, 2023

NORTH CAROLINA WILDLIFE RESOURCES COMMISSION

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North Carolina Wildlife Resources Commission
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All photos by Jeff Hall, unless otherwise noted here: cover page, top right, Dr. Jeff Humphries; page 3, Jeff Beane; page 9, Shutterstock; page 11, NCWRC; page 12, Chris Kregel.

EXECUTIVE SUMMARY

The Southern Hognose Snake is state-listed as Threatened in North Carolina. The species inhabits deep, sandy soils primarily associated with Longleaf Pine ecosystems in the Sandhills and Coastal Plain, but its range has been reduced dramatically over the last century. The species has been reported historically from 20 counties in North Carolina, but it has only been reported in 13 counties in the past 20 years (Bladen, Brunswick, Cumberland, Duplin, Hoke, Moore, New Hanover, Onslow, Pender, Richmond, Robeson, Sampson, Scotland). The current population strongholds include large, well-managed areas, especially in the Sandhills region. Reasons for the species' decline include loss of habitat, changes in land use, lack of compatible forest management, frequent road mortality, impacts of Red Imported Fire Ants (*Solenopsis invicta*), and collection of animals from the wild for the pet trade. Increasing and restoring populations of the Southern Hognose Snake are ultimate goals of this conservation plan. These goals can be reached by working with partners to purchase and protect large tracts of land, focusing on connecting populations, and restoring habitat that is conducive to supporting this species. Sound habitat management, especially including prescribed fire, and habitat restoration is imperative to the future viability of the Southern Hognose Snake. Other conservation measures include education about laws regarding take, reduction of road mortality, efforts to control or reduce the spread of fire ants, and scientific research addressing the effects of land use on the species. Finally, staff should continue efforts to monitor the status of the Southern Hognose Snake and provide information to target land acquisition opportunities and direct management of acquired lands.

BIOLOGICAL INFORMATION

Description and Taxonomic Classification

The Southern Hognose Snake (*Heterodon simus*) is a small, stout-bodied snake with a prominently upturned snout, ranging in color from gray, tan, brown, to orange. They have 20 to 28 dark middorsal blotches with smaller dorsolateral blotches and a banded tail pattern (Palmer and Braswell 1995). Unlike the similar looking Eastern Hognose Snake (*Heterodon platirhinos*), the underside of the tail of the Southern Hognose Snake is similar in color to the posterior end of the belly. A prominent dark stripe is present running posterior from the eye to the rear of the mouth, and a prominent dark blotch is present on either side of the neck. The species grows to 61 centimeters (approximately two feet) in total length (Conant and Collins 1998). Females are larger than males, and males have proportionally longer tails than females (Palmer and Braswell 1995). Like other species of hognose snakes, *H. simus* may exhibit elaborate behavior when threatened, including hissing, spreading their necks, and eventually feigning death to deter predators. However, Southern Hognose Snakes exhibit this behavior much less frequently than Eastern Hognose Snakes.

Feigning death to deter predators

This species was first described by Linnaeus in 1766 and, through various scientific protocols, was named *Heterodon simus* by Holbrook in 1842. There are currently five members of the genus *Heterodon*, all endemic to North America, though the Southern (*H. simus*) and Eastern (*H. platirhinos*) Hognose Snakes are the only ones found in the Southeastern United States, and they are often found in the same habitat. Southern Hognose Snakes are referred to by other colloquial names including hissing adder, blow viper, puff adder, spreading adder, and hissing sand snake (Conant and Collins 1998; Gibbons and Dorcas 2005). The recommended standard name for *H. simus* is Southern Hog-nosed Snake, but most herpetologists refer to the species as Southern Hognose Snake.

Of the five members of the genus Heterodon*, only the Southern Hognose Snake (left) and the Eastern Hognose Snake (right), are found in the Southeastern United States, often in the same habitat.*

Life History and Habitat

The most comprehensive overview of Southern Hognose Snake life history is outlined in the publication, "Natural History of the Southern Hognose Snake (*Heterodon simus*) in North Carolina, USA" (Beane, et al. 2014). Much of the information about life history and habitat presented here is summarized from that publication. The Southern Hognose Snake inhabits xeric Sandhills and other deep sand habitats throughout the Coastal Plain but is now mainly restricted to the Sandhills ecoregion and the southeastern portion of the Coastal Plain in North Carolina (see distribution section for greater detail). The species is usually tied to well-managed longleaf pine-wiregrass-turkey oak ecological communities, but they can also be found crossing roads between altered or disturbed habitats such as old fields, mixed forests, agricultural plots, clearcuts, and rural yards (Beane, et al. 2014).

The Southern Hognose Snake is now mainly found in the Sandhills ecoregion and southeastern portion of the Coastal Plain in North Carolina.

The Southern Hognose Snake is strictly diurnal and often fossorial (Palmer and Braswell 1995). Although this snake spends much of its time underground, surface activity peaks in September and October on warm, sunny days, and encounter frequency of the species is highest from mid-morning to early afternoon during those months. There is also a smaller peak in activity during April and May, possibly correlating with mating. Courtship and mating in North Carolina have been observed in May and September (Beane, et al. 2014) and hatchlings can be found moving on the surface by September and October. They are oviparous, producing clutches of 6 to 14 eggs measuring from 2.4 – 3.4 centimeters in length. Hatchling snakes range from 13.5 – 17.0 centimeters (Palmer and Braswell 1995). The Southern Hognose Snake uses its upturned snout to

burrow into sand 20 to 30 centimeters deep (Palmer and Braswell 1995), and two adults have been found as deep as 46 centimeters in apparently self-excavated hibernacula beneath the sand (Beane, et al. 2007; Beane, et al. 2014). They do not seem to use tree stumps for overwintering like many other snakes in the same habitat. They have been reported to live from 12 – 18 years in captivity (Beane 2015) but nothing is reported about their longevity in the wild. Documented predators include Eastern Kingsnake (*Lampropeltis getula*), Black Racer (*Coluber constrictor*), Red-tailed Hawk (*Buteo jamaicensis*), Red-shouldered Hawk (*B. lineatus*), and Great Horned Owl (*Bubo virginianus*) (Palmer and Braswell 1995; Beane 2012), though likely many other species consume hognose snakes as prey.

Based on examinations of stomach contents from dead individuals, the diet of *H. simus* consists of Eastern Spadefoots (*Scaphiopus holbrookii*), other toads (Genus *Anaxyrus*), Six-lined Racerunners (*Aspidoscelis sexlineatus*), Ground Skinks (*Scincilla lateralis*), and invertebrates such as an Ox Beetle (*Strategus antaeus*) larva and a Tree Stink Bug (*Brochymena arborea*) (Palmer and Braswell 1995; Beane, et al. 1998; Beane, et al. 2011; Beane, et al. 2014). Southern Hognose Snakes likely use their highly upturned snouts to dig up prey from sandy soils (Goin 1947). They also have large, ungrooved “rear fangs” whose hypothesized use is to deflate toads as they are being swallowed. It may be more likely that these specialized teeth are used to inject a mild venom into prey items.

Southern Hognose Snakes likely use their highly upturned snouts to dig up prey, such as Eastern Spadefoots (inset) and other toads, from sandy soils.

Distribution and Population Status

The Southern Hognose Snake once occurred from eastern North Carolina, south to Florida, and west to Mississippi; however, populations in Mississippi and Alabama are likely extirpated. In North Carolina, the species ranged from near Raleigh, east to near Morehead City, throughout the southeastern portion of the state and throughout the Sandhills (Fig. 1). The most robust populations of the species currently occur on and around the Sandhills Game Land and nearby areas in the Sandhills, though the species once occurred much farther north and east of its current known distribution.

Based on NC Natural Heritage Program data, there are 1,317 individual records of Southern Hognose Snakes in North Carolina, dating back to 1907. There have been 874 records reported between 2000 - 2020, though most of those occurred in the Sandhills ecoregion. Over the past 20 years, the Southern Hognose Snake has only been documented in 13 of the 20 counties where it historically existed. Little is known about

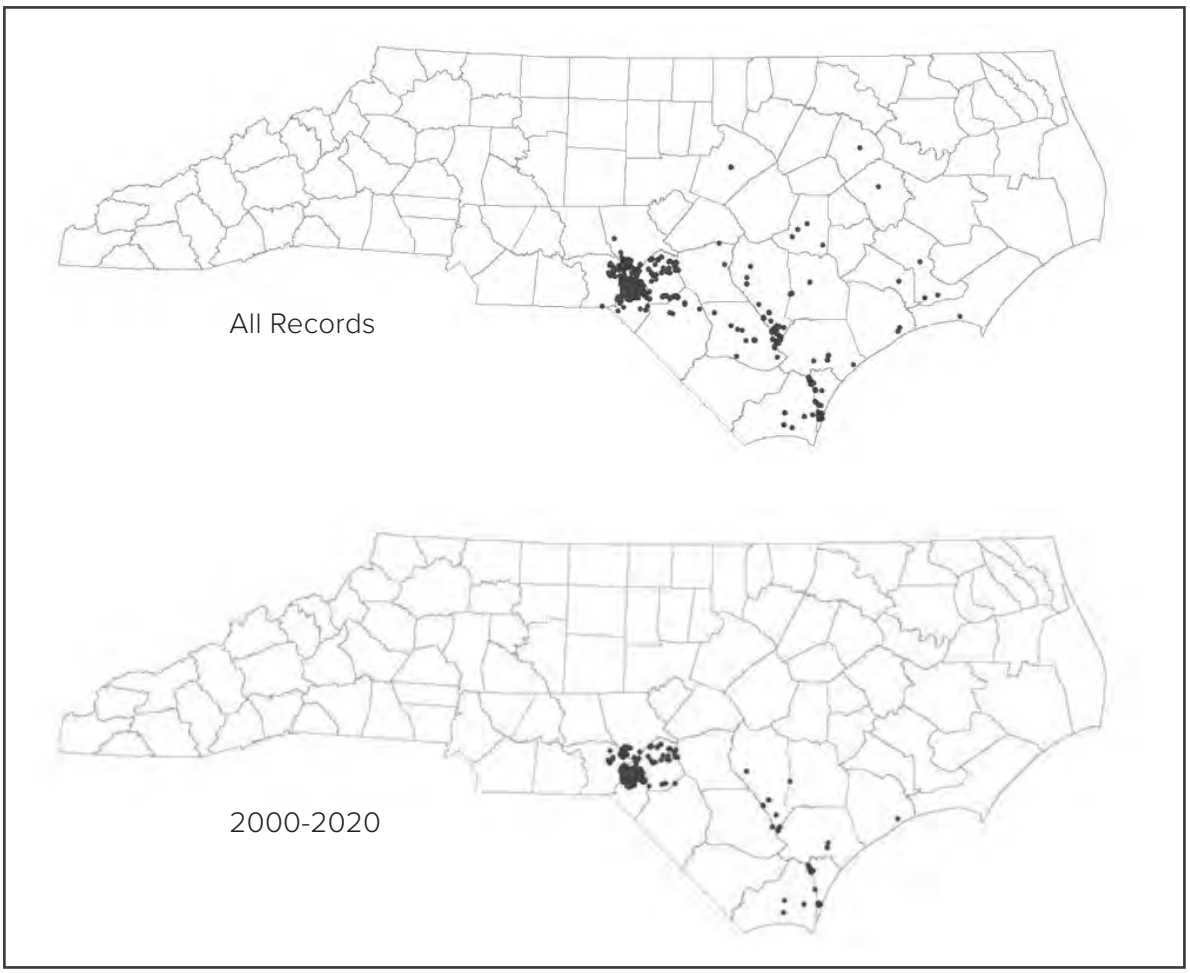

*Figure 1. Distribution of the Southern Hognose Snake (*Heterodon Simus*) in North Carolina based on all known records since the early 1900s (top) compared to recent records from 2000-2020 (bottom). Records are from the NC Natural Heritage Program and the NC Museum of Natural Sciences.*

the abundance of this species, but road-driving surveys conducted from 1985-2012, including 743 observations of the species, did not find a discernible trend in encounter rates where intensive surveys took place (Beane, et al. 2014). However, 643 (84%) of the snakes encountered during those surveys were found dead on roads. Despite not finding a downward trend in snake encounters (dead or alive) during that study, the range of the Southern Hognose Snake has clearly diminished significantly in North Carolina over the past century. The stronghold for the species is now in the Sandhills ecoregion, but scattered populations still occur in parts of the Cape Fear Arch / Bladen Lakes region to the Wilmington area. A notable decline in observations of the Southern Hognose Snake over the past several decades has occurred in Bladen and Sampson counties. More surveys are needed in counties where recent drastic declines appear to have occurred. Determining population sizes of Southern Hognose Snakes is extremely difficult, likely because the species is highly fossorial, infrequently encountered except on roads, and road mortality is high. For instance, from 2014 – 2020, mark-recapture studies focused on this species on Sandhills Game Land resulted in 42 individuals marked, with only 4 individuals recaptured (NCWRC data). A study by Willson, et al. (2018) attempted to estimate abundance based on road encounters. Models were constructed using number of snake encounters and the time it takes a snake to cross a road. The study also modeled movements based on radiotelemetry. They estimated densities of Southern Hognose Snakes in the North Carolina Sandhills to be 0.17 snakes (adults and juveniles) per hectare of upland habitat. The Sandhills Game Land encompasses approximately 65,000 acres (26,300 hectares), with approximately 55,000 acres (22,260 hectares) of upland habitat. Extrapolated densities of Southern Hognose Snakes based on that study suggest a population size of 3,800 individuals on Sandhills Game Land. That estimate is likely an overestimate, as much of the upland habitat on the Game Land may not be suitable for this species. It is difficult to describe conservation goals in terms of population size because of the uncertainty in estimating abundance.

A highly fossorial species, the Southern Hognose Snake is infrequently encountered except on roads, and road mortality is high.

THREAT ASSESSMENT

Reason for Listing

The Southern Hognose Snake's disappearance from much of its former range in North Carolina, its decline in other states, and the loss of the longleaf pine ecosystem have been well documented (Noss, et al. 1995; Tuberville, et al. 2000). The species faces habitat loss and fragmentation, mortality on roads, and predation by the Red Imported Fire Ant (Tuberville, et al. 2000; Gibbons and Dorcas 2005; Tuberville and Jensen 2008). The large reduction in this species' range over time, combined with ongoing threats to its extant populations, warranted a listing of State Threatened. Southern Hognose Snakes have disappeared at the periphery of the range, including the northeastern portion of their range in North Carolina. This is consistent with range reduction in their southwestern range in the Gulf states. The Southern Hognose Snake was petitioned for Federal listing by the U.S. Fish and Wildlife Service in 2012; however, Federal listing of the species was found not to be warranted (USFWS 2019). Analyses done by USFWS indicated that "redundancy and representation will likely decline from current conditions; however, the Southern Hognose Snake is expected to remain viable into the foreseeable future."

Along with habitat loss and fragmentation and road mortality, the Red Imported Fire Ant is one of many threats facing the Southern Hognose Snake.

Present and Anticipated Threats

The loss of well-managed habitat in the Sandhills and Coastal Plain is the biggest reason for recent and present declines of the Southern Hognose Snake in North Carolina. Increased development and the associated loss of habitat and increased vehicle traffic continue to threaten this species. The inability to manage large contiguous blocks of forest with prescribed fire is an ongoing and future threat also associated with increased development. The loss or degradation of wetlands may impact populations of this species by reducing the amphibian prey base. Red Imported Fire Ants are likely detrimental to Southern Hognose Snake populations and fire ants are likely to continue to increase across the region. Finally, collection of this species from the wild for the pet trade or personal collections is certainly known, but the impact of collection on populations is not documented.

Summary of Threats

- Loss of habitat through development and land conversion.
- Road mortality due to increased vehicle traffic associated with development.
- Reduction in application of compatible land-management practices (e.g., prescribed fire, maintaining open forests with ground cover, maintenance of productive wetlands that produce a plentiful prey source).
- Possible mortality of eggs and juvenile snakes caused by Red Imported Fire Ants (*Solenopsis invicta*).
- Poaching of individuals for the pet trade.

Historic and Ongoing Conservation Efforts

Protection of land and compatible management techniques (e.g., prescribed fire, upland pine thinning) on land managed by NCWRC and other entities has likely had the greatest conservation impact on the Southern Hognose Snake. The fact that the best remaining populations of this species now occur on and around Sandhills Game Land is evidence of the importance of land conservation and habitat management. Partnerships between NCWRC, The Nature Conservancy, Department of Defense, and other entities are actively protecting land in the Sandhills (where the core populations remain) for the benefit of many species including the Southern Hognose Snake.

> The single-most important conservation effort is the continued conservation and management of land within the current and historic range of Southern Hognose Snakes, especially focused on connecting large tracts of land together.

Research on the natural history of the Southern Hognose Snake has helped the conservation of the species by providing information about how the species uses the landscape, information about nesting, and diet. Work by Jeff Beane (NC Museum of Natural Sciences) and Project Simus continue to provide information about the life history, movement patterns, and habitat use of this species. Biologists with NCWRC have also been surveying for and marking Southern Hognose Snakes, along with other snake species, on Sandhills Game Land for over 6 years. This research is gathering further natural history information and is identifying areas with the most robust remaining populations.

Southern Hognose Snake hatchling

CONSERVATION GOAL AND OBJECTIVES

Conservation Goal

Biologists with the NC Wildlife Resources Commission and partner organizations aim to stabilize then increase Southern Hognose Snake populations in North Carolina. This plan's proximate goals are to prevent the loss of populations of the Southern Hognose in their stronghold in the Sandhills and to prevent the extirpation of, and increase outlying populations. Long-term overall goals are to prevent extirpation and to increase population viability of this species in North Carolina over at least the next 100 years.

Conservation Objectives

1. Increase habitat and connect Southern Hognose Snake populations through the purchase of land and/or conservation easements in the Sandhills ecoregion specifically.
2. Increase populations of the Southern Hognose Snake through compatible management practices such as prescribed burning, thinning as needed, and connecting tracts of high-quality habitat.
3. Restore and increase populations of the Southern Hognose Snake in historically occupied areas where declines have occurred but where small populations persist (e.g., Southern Coastal Plain) through land acquisition, conservation easements, and management aimed at improving the integrity of longleaf pine ecosystems.
4. Reduce pressure on local populations by educating people about laws specific to collection for the pet trade and private collections.
5. Mitigate road mortality of individuals using management actions such as wildlife crossings, road closures, and halting new road construction in areas of prime habitat.
6. Reduce the numbers and spread of Red Imported Fire Ants on landscapes where the Southern Hognose Snake occurs. This can be done by limiting soil disturbance and direct treatments of fire ant colonies.
7. Conduct research exploring the effects of land use on Southern Hognose Snake populations.
8. Education and outreach should be conducted to promote awareness of, and conservation actions needed to conserve this species.

Summary of Actions Needed

Actions needed to increase populations of the Southern Hognose Snake are presented in Table 1 (page 14). The most important action needed is to increase the number of large tracts of Longleaf Pine ecosystems and to connect tracts to increase the viability of Southern Hognose populations. In the Sandhills specifically, it is estimated that acquiring an additional 6,000 – 8,000 acres of land at minimum is needed to increase connection between Sandhills Game Land and Fort Bragg military installation and to link key outlying blocks on Sandhills Game Land (Jeff Marcus, The Nature Conservancy, pers. comm.). Conservation easements where quality habitat still occurs is also a viable option for maintaining populations of the species.

Sandhills Game Land

Purchasing, restoring, and increasing management to connect and maintain healthy longleaf pine forests in areas where the species seems to have declined significantly (e.g., Bladen Lakes region) are important to restore relict or declining populations in the state. For example, the purchase of 5,000 – 6,000 acres of land in the northern Bladen Lakes region and near 18,000 acres in the southern Bladen Lakes region would create large blocks of connected land that would benefit many species, including the Southern Hognose Snake (Jeff Marcus, The Nature Conservancy, pers. comm.).

Continued and increased sound habitat management is needed to promote healthy, open Longleaf Pine habitat where populations appear to be relatively stable. These management actions include prescribed burning, thinning of dense forests as needed, and restoration of wetlands for production of a healthy prey base. Where populations have declined, forest management and land use need to be altered to align with the habitat needs of the Southern Hognose Snake and other species associated with healthy longleaf pine ecosystems. For example, large areas of the Bladen Lakes region are managed as working forests where much of the landscape is harvested on a rotation or used for pine straw raking for revenue. For the Southern Hognose Snake and other wildlife species dependent on the Longleaf Pine ecosystem, these landscapes need to be managed differently, avoiding short-rotation forestry, and increasing the use of prescribed fire to restore ground cover and reduce soil disturbance. Management actions directed toward improving and maintaining habitat for the Southern Hognose Snake will also benefit habitat for the Northern Pinesnake, Eastern Coachwhip, Pigmy Rattlesnake, Eastern Diamondback Rattlesnake, Chicken Turtle, Gopher Frog, Ornate Chorus Frog, Southern Chorus Frog, Pine Barrens Treefrog, Northern Bobwhite, Red-cockaded Woodpeckers, and Bachman's Sparrow, as well as many rare plant species.

The most important conservation action needed to increase populations of Southern Hognose Snakes is to increase the number of large tracts of Longleaf Pine ecosystems.

The North Carolina Sandhills are a well-known and frequently visited area for people interested in finding rare reptiles and amphibians, including Southern Hognose Snakes. While most people may seek this species just for the experience of seeing or photographing them, some collection of animals likely takes place. Law Enforcement should continue to monitor highly visited areas during peak activity times (September and October) to educate the public and enforce laws regarding the take of Southern Hognose Snakes. Law Enforcement presence alone helps deter take of the species, especially on Game Lands.

As noted, Southern Hognose Snakes experience extremely high rates of mortality on roads. Installing wildlife crossings on current roads as well as during new road construction, where high quality Southern Hognose Snake habitat exists, can help reduce fragmentation of populations.. The closure of certain roads, especially in areas where large numbers of animals migrate during fall activity periods should be considered where possible. NCWRC should reinforce our policy of not building new roads on Sandhills Game Land and other properties where the Southern Hognose exists. We should also discourage paving sand and dirt roads because paved roads lead to increased traffic, higher traffic speeds, and higher snake mortality.

Reducing the abundance and spread of Red Imported Fire Ants on the landscape would benefit Southern Hognose Snake populations and other ground-nesting and fossorial species. Some non-chemical methods are available (Tschenkel and King 2007), but these methods are only effective on small scales. Soil disturbance, which often facilitates the colonization of fire ants, can be reduced by avoiding the installation of new wildlife food plots on the landscape, as well as trying to avoid creating new fire lines, especially when they are not necessary.

Research is needed to determine the effects of various types of land use on Southern Hognose Snake populations. This species is highly fossorial, and therefore may be heavily impacted by management that results in heavy soil disturbance and compaction. Exploring the impacts of management and land use could help to inform why the species has declined in certain areas and inform restoration goals.

Finally, education and outreach should continue to promote awareness of this species, threats facing it, and land management strategies to improve habitat for the Southern Hognose and other species that share its habitat. Educational materials should be made available to the public through brochures, information on the NCWRC website, and through presentations at venues such as North Carolina Partners in Amphibian and Reptile Conservation (NCPARC), the North Carolina Herpetological Society (NCHS), the Sandhills Conservation Partnership, and through outreach at events taking place within the range of this species.

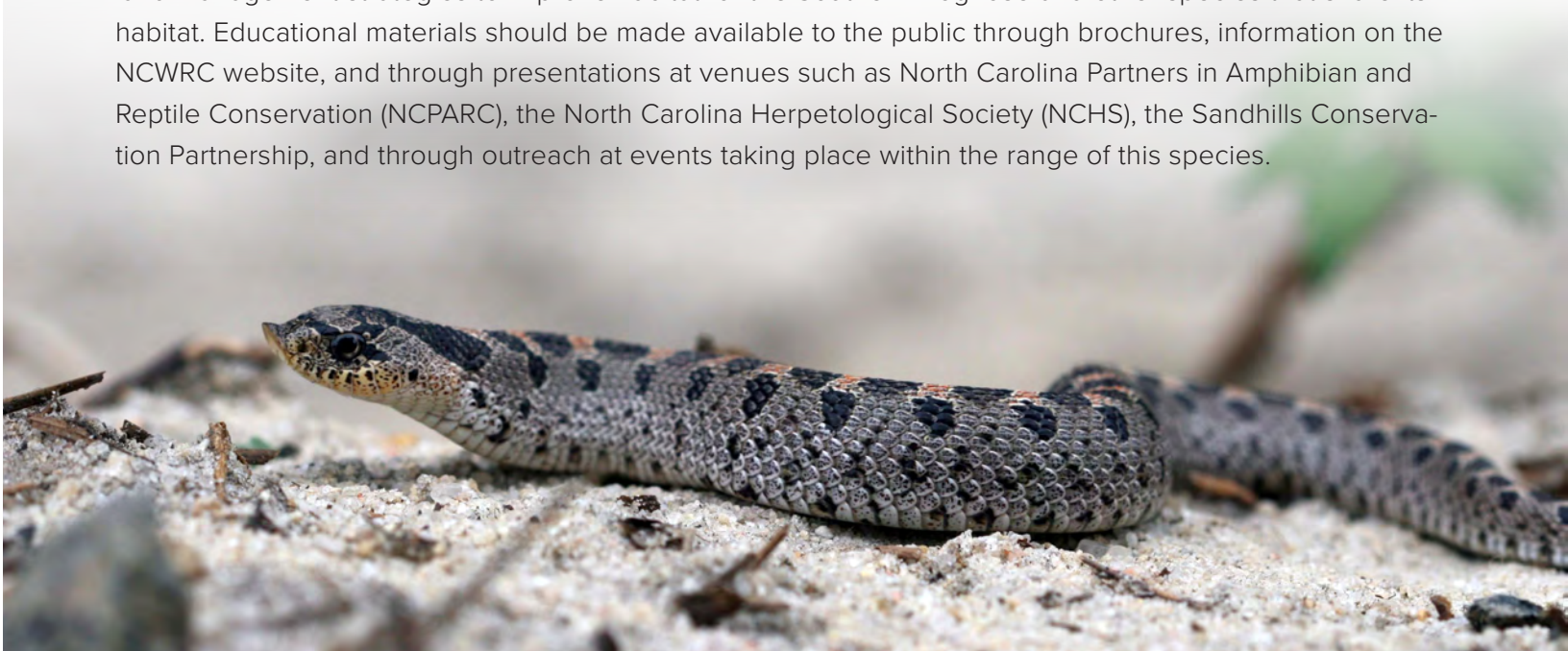

Table 1. A summary of conservation actions needed to address the goals, the partners involved, and the desired outcomes of each action. These actions are listed generally in order of priority, though all actions are considered important and necessary.

#	ACTIONS	OBJECTIVES	PARTNERS	DESIRED OUTCOMES
1	Land acquisition	Increase and connect populations	The Nature Conservancy (TNC), Department of Defense (DOD), NC Forest Service, NC State Parks	Increase populations and the future viability of the Southern Hognose Snake in North Carolina
2	Compatible land management	Maintain and restore high-quality habitat	TNC, DOD, NC Forest Service, NC State Parks, Private Landowners	Increase populations of Southern Hognose Snakes where they occur
3	Restore populations	Establish or increase populations where diminished or extirpated	DOD, NC Forest Service, NC State Parks, U.S. Forest Service	Increase relict populations to a point where they are viable for the foreseeable future
4	Law enforcement	Increased education, monitoring, and enforcement of laws prohibiting the collection of animals	NCWRC Law Enforcement Division	Reduce the loss of animals to collectors
5	Mitigate direct mortality by vehicle traffic	Reduce road mortality using multiple methods	NCDOT, Landowners	Increase populations by reducing road mortality
6	Control or reduce Red Imported Fire Ants	Decrease the extent or numbers of Red Imported Fire Ants where possible	North Carolina Zoo, TNC, and others	Reduce mortality of eggs or juveniles of Southern Hognose Snakes caused by fire ants
7	Conduct research	Determine the effects of land use and management on populations	NCWRC staff, Universities, other research institutions	Provide tangible information to guide land management that benefits the Southern Hognose Snake
8	Education and outreach	Promote awareness of and conservation of the species.	NCPARC, NCHS, Sandhills Conservation Partnership, NC State Parks, NC Zoo	Educate the public about the Southern Hognose and promote conservation actions that benefit the species and its habitat.

GLOSSARY

Sandhills ecoregion:
A portion of south-central North Carolina on the Fall-line Sandhills. Uplands consist of deep, mostly well-drained, sandy terrain dominated by Longleaf Pine – Wiregrass communities, interspersed with drainages consisting of seepages, creeks and rivers, bottomland hardwood forests and impoundments. Upland habitat is maintained by a 3 – 5 -year natural fire cycle, mostly now maintained by prescribed burning.

Threatened species:
In North Carolina, "Any native or once-native species of wild animal that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range or one that is designated as a threatened species pursuant to the Endangered Species Act."

Population:
The number of individuals of a particular species in a given area. For this plan, populations are defined as the number of individuals that are connected throughout a given area and can interact with each other biologically (breeding). "Population size" could also be defined as the number of individuals that occur across the entirety of the species' range in the state.

Fossorial:
An animal that is adapted to burrowing and spends much of its time underground.

Oviparous:
Producing eggs that develop and hatch outside of the maternal body. An egg-layer.

Hibernaculum / Hibernacula:
A place(s) where an animal seeks refuge to overwinter.

Extant:
Still in existence; surviving.

Relict:
A remnant population of a formerly widespread species that currently persists in an isolated area.

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EXHIBIT N

July 13, 2023

North Carolina Wildlife Resources Commission

Cameron N. Ingram, Executive Director

MEMORANDUM

TO: M. Kyle Briggs, Chief Deputy Director

FROM: Christian T. Waters, Inland Fisheries Division Chief

DATE: July 5, 2023

SUBJECT: Request from Town of Black Mountain to participate in the Mountain Heritage Trout Waters Program

Staff recommends that the Wildlife Resources Commission (Commission) recognize the Town of Black Mountain as a Mountain Heritage Trout City and incorporate a portion of the Hatchery Supported Trout Waters section of the Swannanoa River into Mountain Heritage Trout Waters. The Town of Black Mountain requested this designation in a March 30, 2023 email from the Town's Planning Director (see attached), and the Town Council confirmed the request at its meeting on June 12, 2023.

The reach of the Swannanoa River proposed for designation as Mountain Heritage Trout Waters includes 4.4 miles of the existing Hatchery Supported Trout Waters from the SR2702 (E. Old US 70 Hwy) bridge downstream to the SR2500 (Blue Ridge Road) bridge. The river is currently accessible via several Town parks and sections of greenway. The Town has plans to extend the greenway along additional sections of river. Designated public parking is provided at multiple locations within the Town and in conjunction with the parks.

The Town of Black Mountain meets the criteria established by the Commission for participation in the Mountain Heritage Trout Waters Program. The reach of the Swannanoa River in and adjacent to the Town is designated Public Mountain Trout Waters. The Town of Black Mountain currently provides unrestricted public access to these waters. Finally, the Town of Black Mountain has formally requested to participate in the program and is willing to enter into a Memorandum of Agreement (MOA). A draft MOA and Mountain Heritage Trout Waters brochure for Black Mountain is attached.

Mailing Address: Inland Fisheries Division • 1721 Mail Service Center • Raleigh, NC 27699-1700
Telephone: (919) 707-0220 • **Fax:** (919) 707-0028

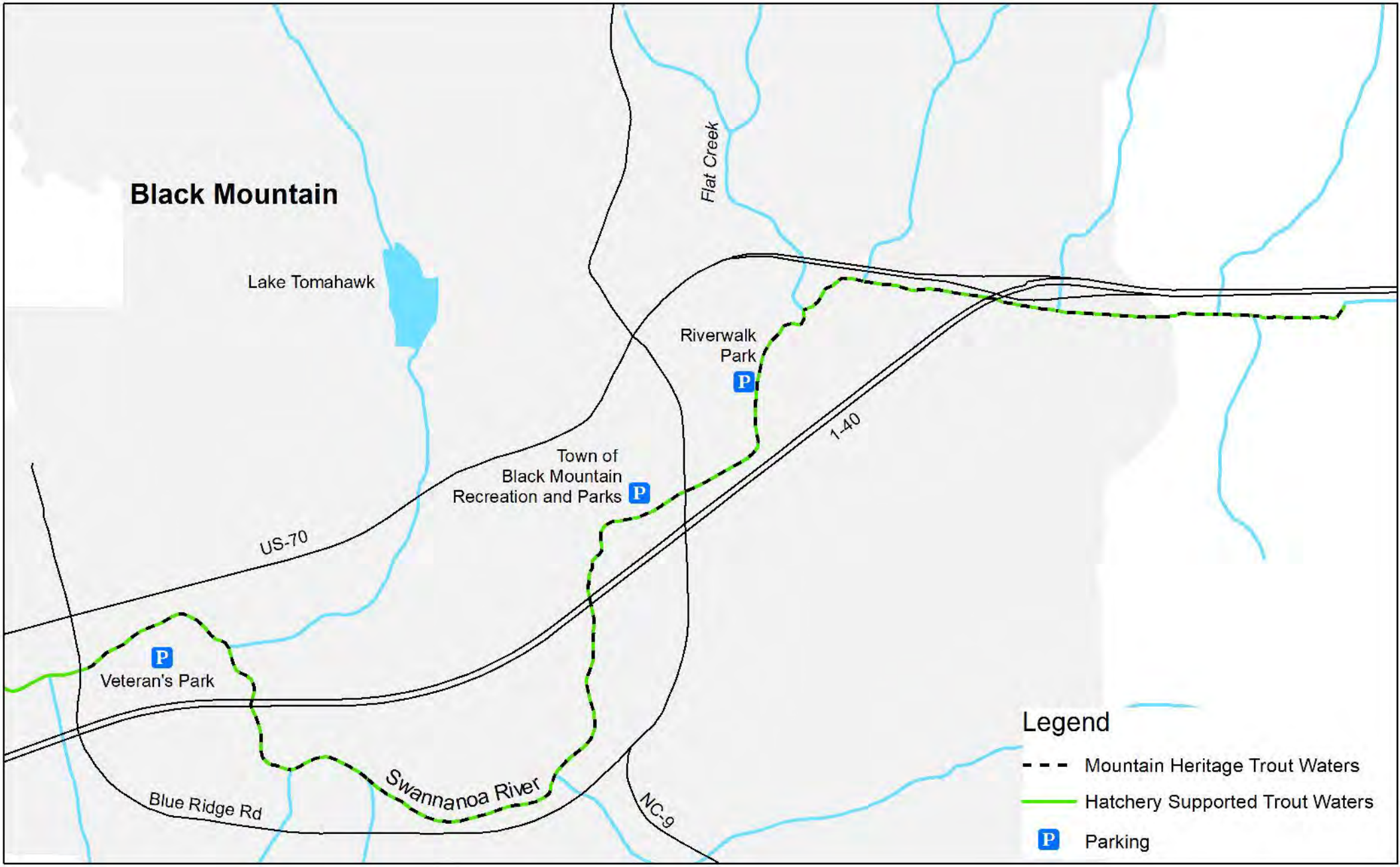
From: Jessica Trotman [redacted]
Sent: Thursday, March 30, 2023 3:46 PM
To: Besler, Doug A.
Subject: [External] Mountain Heritage Program

Good afternoon, Doug,

Thank you for making the visit to Black Mountain this morning. I spoke with the Town Manager this afternoon, and he confirms that Town would like to move forward to participation in the NC Mountain Heritage Trout Waters program. We look forward to this being the beginning of increased programming and engagement with our river and streams in Town and appreciate your support in this effort.

Sincerely,
Jessica

Jessica Trotman, MSEH
Planning Director
Town of Black Mountain


Black Mountain
Lake Tomahawk
Flat Creek
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Town of
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Recreation and Parks
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Swannanoa River
Blue Ridge Rd
NC-9
Legend
Mountain Heritage Trout Waters
Hatchery Supported Trout Waters
P
Parking

MEMORANDUM OF AGREEMENT

between

TOWN OF BLACK MOUNTAIN

and the

NORTH CAROLINA WILDLIFE RESOURCES COMMISSION

for recognition as a

MOUNTAIN HERITAGE TROUT CITY

THIS AGREEMENT, made and entered into this ____ day of _____, by and between the Town of Black Mountain, North Carolina, hereinafter called the **Town**, and the North Carolina Wildlife Resources Commission, hereinafter called the **Commission**;

WITNESSETH:

Whereas, the **Commission** is authorized to conduct a program of fishery management for the benefit of the citizens of North Carolina; and

Whereas, the **Commission** is authorized to establish and implement a Mountain Heritage Trout Waters Program; and

Whereas, it is desirable for the **Town** to participate in the Mountain Heritage Trout Waters Program in order to promote the goals of said Program;

Now, therefore, in consideration of the mutual advantages likely to result from this agreement and the respective obligations assumed herein,

THE COMMISSION AGREES:

1. To provide technical assistance required to execute this Agreement;

2. To delineate an agreed segment of the Swannanoa River within which the Mountain Heritage Trout Waters fishing license will be valid;

3. To incorporate the specific segment of the Swannanoa River into rule or regulation consistent with other Designated Public Mountain Trout Waters;

4. To design a **Town**-specific brochure to inform the public of the existence and elements of the Mountain Heritage Trout Waters Program; and

5. To formally recognize the **Town** as a Mountain Heritage Trout City.

THE TOWN AGREES:

1. To secure unrestricted public access through lease agreement, easement, or other means to the agreed segment of the Swannanoa River;

2. To permit ingress, egress and regress to **Commission** personnel engaged in executing this Agreement; and

3. To produce and distribute the **Town**-specific brochure designed by the **Commission** to inform the public of the existence and elements of the Mountain Heritage Trout Waters Program.

IT IS MUTUALLY AGREED:

1. That this Agreement shall become effective as soon as signed by both parties;

2. That this Agreement may be amended only by mutual agreement of the parties and may be terminated in its entirety for cause by either party upon sixty (60) days written notice to the other party;

3. That this Agreement is made under and shall be governed by and construed in accordance with the laws of the State of North Carolina, without regard to its conflict of laws rules, and within which State all matters, whether sounding in contract, tort or otherwise, relating to its validity, construction, interpretation and enforcement shall be determined;

4. That the parties shall comply with all laws, ordinances, codes, rules, regulations, and licensing requirements that are applicable to the conduct of its business and its performance in accordance with this Agreement, including those of federal, state, and local agencies having jurisdiction and/or authority;

5. That during, and after the term hereof during the relevant period required for retention of records by State law (G.S. 121-5, 132-1 et seq., typically five years), the State Auditor and any Purchasing Agency's internal auditors shall have access to persons and records related to this Agreement to verify accounts and data affecting performance under the Agreement, as provided in G.S. 143-49(9). However, if any audit, litigation or other action arising out of or related North Carolina General Terms and Conditions in any way to this project is commenced before the end of the such retention of records period, the records hall be retained for one (1) year after all issues arising out of the action are finally resolved or until the end of the record retentions period, whichever is later;

6. That neither party shall be deemed to be in default of its obligations hereunder if and so long as it is prevented from performing such obligations as a result of events beyond its reasonable control, including, without limitation, fire, power failures, any act of war, hostile foreign action, nuclear explosion, riot, strikes or failures or refusals to perform under subcontracts, civil insurrection, earthquake, hurricane, tornado, other catastrophic epidemic or pandemic, natural event or Act of God;

7. That notwithstanding any other term or provision in this Agreement, nothing herein is intended nor shall be interpreted as waiving any claim or defense based on the principle of sovereign immunity or other State or federal constitutional provision or principle that otherwise would be available to the State under applicable law; and

8. That nothing in this Agreement shall obligate either party to any conditions not specifically stated herein.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement the day and year first written above.

Approved and agreed to:

Town Official	North Carolina Wildlife Resources Commission
Date	Date

NC MOUNTAIN HERITAGE
TROUT CITY

Promoting the Beauty, Diversity and Historical Significance of North Carolina's Trout Streams

Mountain Heritage Trout Waters encourage trout fishing as a heritage tourism activity in western North Carolina and are located in participating cities and towns that provide public access to waters running through or adjacent to the city or town.

Mountain Heritage Trout Waters are managed by the N.C. Wildlife Resources Commission. Since 1947, the agency has been dedicated to the wise use, conservation and management of the state's fish and wildlife resources.

Brook Trout

Providing Quality Trout Fishing Opportunities in Scenic, Beautiful Western North Carolina

Mountain Heritage Trout Waters provide quality fishing opportunities in popular tourist destinations in western North Carolina. The N.C. Wildlife Resources Commission, which sells the Mountain Heritage Trout Waters license, gives anglers two quick and easy ways to purchase a license:

- By phone: 833-950-0575. Hours of operation are: 8 a.m.-5 p.m., Mon.-Fri. Closed holidays.
- Online: gooutdoorsnorthcarolina.com

The license is valid for a 3-day period and costs $8 for residents and non-residents age 16 and older. The license is valid only for waters that are designated as Mountain Heritage Trout Waters.

Write your fishing license number and valid dates on the line above.

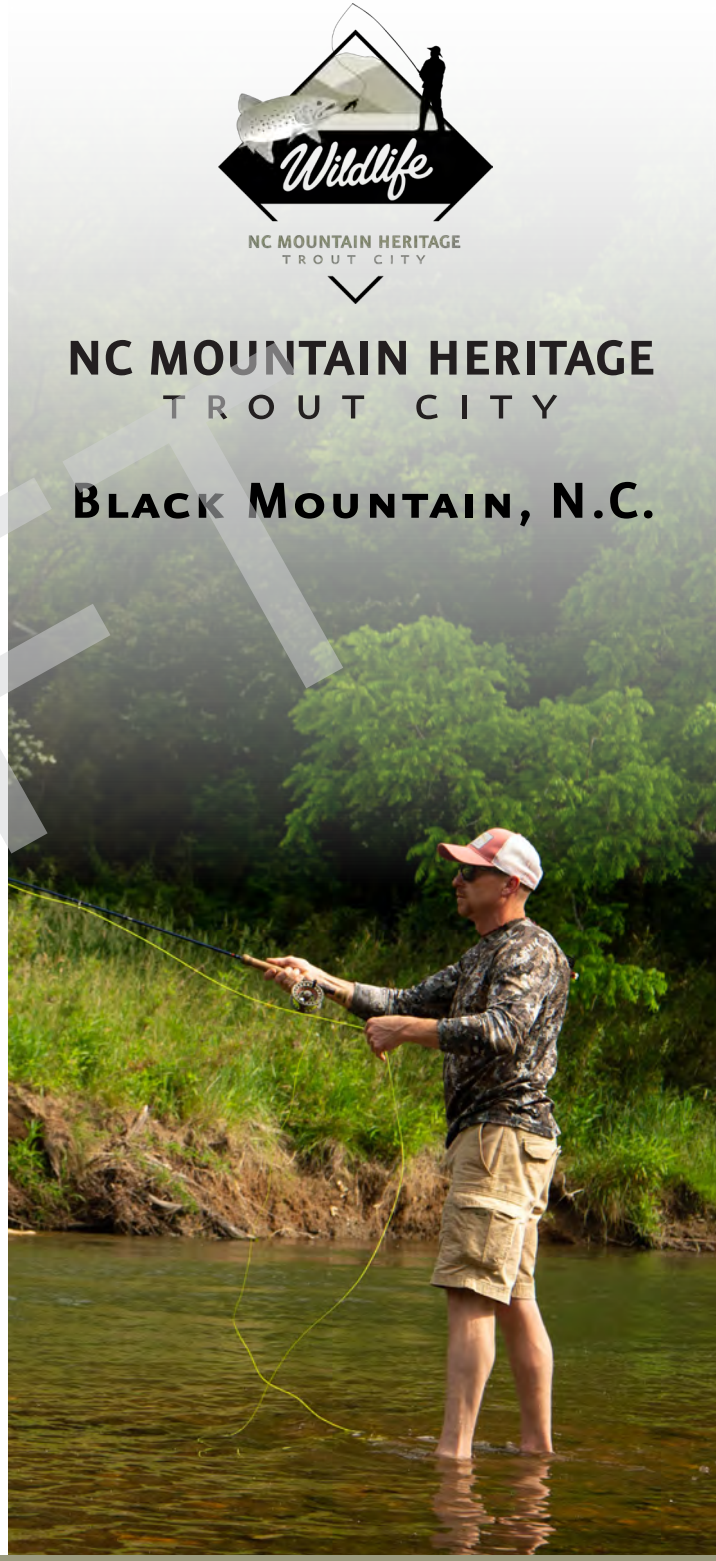
NORTH CAROLINA Wildlife RESOURCES COMMISSION

For more information on fishing in the state's public, inland waters, visit ncwildlife.org/fishing.

NC MOUNTAIN HERITAGE
TROUT CITY

NC MOUNTAIN HERITAGE TROUT CITY

Black Mountain, N.C.



Fishing Regulations

Fishing regulations for Mountain Heritage Trout Waters, such as daily creel limits, minimum size limits and lure restrictions, are established by the N.C. Wildlife Resources Commission.

The 4.4-mile section of Swannanoa River is classified as the Black Mountain Mountain Heritage Trout Water and is a Hatchery Supported Trout Water with the following regulations:

- Open season: 7 a.m. on the first Saturday in April until the last day of February.
- Closed to fishing: March 1 until the first Saturday in April
- No bait or lure restriction
- No size limit restriction
- Seven (7) trout per day creel limit

Veteran Exemption

Black Mountain-Mountain Heritage Trout Water Swannanoa River