



Fiscal Note for Proposed Endangered/Threatened/Special Concern Species Rule Amendments for the Wildlife Resources Commission

Rule Amendments: 15A NCAC 10I .0102 Protection of Endangered/Threatened/Special Concern
15A NCAC 10I .0103 Endangered Species Listed
15A NCAC 10I .0104 Threatened Species Listed
15A NCAC 10I .0105 Special Concern Species Listed

Agency Contact: Carrie Ruhlman
Policy Development Manager
NC Wildlife Resources Commission
1751 Varsity Drive, Raleigh, NC
(919) 707-0011
carrie.ruhlman@ncwildlife.org

Impact Summary: State Government: Yes
Local Government: Yes
Private Impact: Yes
Substantial Impact: No

Authority: G.S. 113-134, 113-333

Background

The wildlife resources of the State belong to the people of the State as a whole, including the enjoyment of these resources (G.S. 113-131(a)). The Wildlife Resources Commission (WRC) 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 WRC has been granted rulemaking authority to implement the provisions of these statutes (G.S. 113-134).

As part of its mission, the WRC adopts and publishes an endangered species list, a threatened species list, and a list of special concern species, as required by G.S. 113-333. These lists are amended from time to time, in response to public proposals, federal listing changes, or as the Commission deems necessary. The WRC conducts investigations of its wild animals, as defined in G.S. 113-331, to determine whether the state listings need to be adjusted to accomplish the objectives of managing wildlife resources through sound conservation. The WRC also adopts and implements conservation programs and permitting requirements for endangered, threatened, and special concern species to limit, regulate, or prevent the taking, collection, or sale of protected species

(G.S. 113-333). These programs and requirements are consistent with and adopted in accordance with the agency's Cooperative Agreement with the U.S. Fish and Wildlife Service.¹

The management goal with any state listing is to ensure the stability of a species for long term viability. The permitting process ensures that species are protected, while allowing for reasonable, desirable, and permissible take and possession of these species.

The process for updating the state listing involves a multi-year, transparent process defined by science-based decision making. As detailed in G.S. 113 Article 25, the Nongame Wildlife Advisory Committee (NWAC) identifies and assembles a group of experts from multiple disciplines and other fields to serve as Scientific Councils for taxa groups. Scientific Councils review scientific evidence and provide state listing recommendations to NWAC which advises the Commission on matters related to the conservation of nongame wildlife including the protected animals lists. The Commission is required by G.S. 113-334 to consider the recommendations while examining relevant data and factual information. The proposed changes to the state listings are based on best available data and the status of each species' population as proposed by the North Carolina Species Assessment Tool and detailed in the Wildlife Action Plan (<http://www.ncwildlife.org/plan>).

A summary of the proposed rule amendments and potential impacts is below, with the full rule text included in Appendix A.

I. Introduction and Purpose of Rule Change

The endangered, threatened, and special concern species lists (hereinafter, referred to as the protected species list or state list) identify nongame wild animals to be protected and conserved, so conservation techniques and actions can be implemented, and their population numbers enhanced. An endangered species is one whose continued existence has been determined to be in jeopardy in the state. A threatened species is one that is likely to become endangered within the foreseeable future throughout all, or a significant portion of its range. And a special concern species has been determined to need monitoring. All species on the protected species list are native or once-native species of North Carolina.

The proposed changes to the list are necessary to ensure the continued viability of North Carolina's nongame wildlife diversity by promoting conservation priorities. After review of 10 species in a report from the Scientific Councils on Birds and on Freshwater Mollusks approved by NWAC, the WRC recommends adding three species, removing one species (for a net addition of two species), changing the status of four species, and updating the taxonomic names of 20 species on the protected species list. The proposed list highlights species that meet the definition of endangered, threatened, or special concern.

Proposed changes to the state list include one additional species to be listed as endangered, four

¹ 2022 Cooperative Agreement between the US Fish and Wildlife Service and the NCWRC.

species to be listed as threatened, and two species to be listed as special concern. Overall, there will be 28 changes to the state list due to additions, removals, changes in listing status, and taxonomic name corrections. The goal of these changes is to provide active and appropriate conservation for these species including research, land conservation, monitoring, and habitat restoration. When a species is experiencing a threat to and/or decline in population status, the state listing status can provide additional funding opportunities and research priority to assist in the recovery and population viability.

Adding a species to the protected species list establishes protection from unauthorized take, encourages partners to request funding for species-specific projects, assists in identifying quality habitat that the agency would like to conserve, and informs partners of ecologically significant habitats so they can work to minimize impacts and focus their conservation efforts. Additionally, this information plays a large role in identifying and prioritizing multi-state and regional conservation needs, as well as long-term monitoring programs, and minimizes the likelihood of federal listing for that species.

The agency currently issues permits for take and possession of State and federally listed endangered, threatened, and special concern species for activities including but not limited to surveys, research, possession, relocation, collection, and depredation under the authority of G.S. 113-337 and in accordance with the requirements of the Cooperative Agreement. Over the past two years, an average of 183 endangered species permits were issued per year to individuals, institutions, businesses, and agencies. On average, approximately 22 federally endangered, 42 state endangered, 16 federally threatened, 48 state threatened, and 110 special concern species were included in these permits.

The proposed changes to Rule 10I .0102 update and clarify conditions and requirements for take and possession of listed species and expand upon these terms by including other activities authorized by statute and the Cooperative Agreement, including sale, propagation, transport, import, export, transfer, barter, trade, and stocking. The rule has been re-organized to include all situations and requirements for which an endangered species permit would be issued. Issuance of endangered species permits cannot violate federal restrictions and may be dependent on regulations of other federal and state agencies.

II. Fiscal Impacts - Costs²

State Impact

The proposed amendments to the 10I Rules are anticipated to have a minimal economic impact to the state.

It is unlawful, unless granted specific authorization, for an individual to take, possess, transport, sell, barter, trade, exchange, export or give away any species listed in 15A NCAC 10I .0103 - .0105.³ To enforce this law, the WRC requires all new wildlife enforcement officers to

² All hourly rates for agency staff herein reflect total compensation.

³ G.S. 113-337. Unlawful acts; penalties.

participate in an agency training that includes a one-day review of regulations and field identification for nongame and state listed species. This training includes eight hours of information on the illegal pet trade, collection, and food market, and teaches officers accurate species identification. Additionally, routine refresher trainings are offered to officers, which include information on nongame species with increased unlawful activities, and any changes that have been made to the protected species lists. Though new training materials will need to be developed to incorporate the proposed changes to the 10I Rules, the materials are produced in-house, and staff time anticipated for completion of this task is at most, two hours, resulting in a one-time cost to the agency of \$122 ($\$61/\text{hr}^4 \times 2 \text{ hrs} = \122).

In the field, enforcement officers track their time spent patrolling for unlawful activity involving nongame species, including listed species. Based on officer activity logs from fiscal year (FY) 22 and FY23, less than one percent of each officer's time is spent on nongame specific activities.⁵ These activities include routine patrols for violations, responding to human-wildlife interactions and complaints, assisting biologists with complaints, following leads from citizens, and investigating actual crimes. Over the past two fiscal years, this activity accounted for an average of 4,793 hours per year. There are over 1,000 nongame species in NC and 256 nongame species that are state listed as of FY23. To estimate additional costs to the agency from the three newly listed species, it is assumed that about one-fourth of the 4,793 hours, 1,198.25 hours ($4,793 \text{ hrs}/4 = 1,198.25 \text{ hours}$), spent patrolling in the last two fiscal years was specific to listed species. While it is not anticipated that the addition of 3 new species to the protected species list will have much impact on officer time because many of the new species reside in habitats that are already patrolled, the potential exists for increased illegal activity involving these species. Currently, patrol time, mileage, materials and supplies, and time spent addressing any illegal activity, are estimated to cost the agency an average of \$49,118/FY (from FY22 and FY23 data; $\$41/\text{hr}^6 \times 1,198 \text{ hrs}/\text{FY}$). If there is an increase in illegal activity, this cost could increase. However, it is not possible to predict a potential change at this time.

Additionally, each person convicted of unlawful activities associated with a species on the protected species list is guilty of a Class I misdemeanor. A typical court case for a listed species requires approximately 11 hours of officer time. The number of these cases per year is typically less than five. Based on the available data, the agency incurs a cost of \$451 per court case ($\$41/\text{hr} \times 11 \text{ hrs}/\text{case} = \$451/\text{case}$). However, the agency is not able to predict the number of instances involving illegal take that will go to court because of changes to the protected species list.

Once a species is added to the protected species list, a conservation plan must be developed (G.S. 113-333(b)). These plans detail the restoration and management actions that the agency recommends to secure recovery of the species. Many of these species co-exist in the same habitat and as such, will benefit from the conservation efforts of other species. With this in mind, the species added to the state list may not be additive work per se but will be absorbed into current conservation efforts. For those species not cohabitating with currently listed species, new management plans will be developed. Based on the proposed listings, three species will require new management plans, at an estimated one-time cost to the agency of

⁴ Represents the midpoint hourly salary of a Conservation Biologist II.

⁵ Personal correspondence with law enforcement staff 01/22/2024.

⁶ Represents the midpoint hourly salary of a Wildlife Law Enforcement Officer I.

\$21,960 ($\$61/\text{hr} \times 120 \text{ hrs}/\text{plan} = \$7,320/\text{plan}$; $\$7,320/\text{plan} \times 3 \text{ plans} = \$21,960$).

Recovery efforts for a species in decline may be implemented by the agency regardless of listing status. However, these management techniques will be included in a management plan (required if listed) and could range from monitoring to population augmentation. If a species requires monitoring and data collection, insignificant costs for staff time and supplies may be incurred at an estimated cost of \$200 to \$1,000 per species. Monitoring costs would be low because, depending on the species, sampling efforts are not typically exclusive, and minimal time, effort, and supplies would be needed for collection of additional data. On the other hand, if a more intensive management effort were required, like for the head-start restoration effort currently being implemented for the gopher frog, estimated costs could be close to \$850,000 over a 10- year period.⁷ However, we must note that these conservation actions would likely occur even if the species were not on the protected species lists. These species are species of greatest conservation need (SGCN) within the NCWRC Wildlife Action Plan; therefore, habitat enhancement and restoration, monitoring, augmentation actions, and research would be conducted to benefit these SGCN and others that occur in the same habitats. Although the Wildlife Action Plan summarizes recovery techniques for priority species, the conservation plans will provide more specific details by species.⁸

Excluding endangered species permits for sea turtles, 185 endangered species permits were issued in 2023. Four were issued for collection, 10 were issued for alligator control, 80 were issued for possession, and 92 were issued for surveys/research. Any individual who wishes to take or possess a listed species is required to obtain this permit.⁹ Staff review the permit applications before they are issued. This review requires approximately two hours to complete, at a cost to the agency of \$122 per permit ($\$61/\text{hr} \times 2 \text{ hrs}/\text{permit} = \$122/\text{permit}$). Listing or uplisting a species typically increases the research interest in those species, but the agency is not able to predict how many new permits will be requested.

Agency staff currently review development projects from other state and local agencies to determine the effects of those projects on state-listed species. Though three new species will be listed in Rule, no additional costs to the WRC or any other agencies are anticipated, as neither process, review protocol, nor staffing, will be changed. However, because new species are being added, agency staff will be asked for scientific expertise on proposed projects during the permit review process to assist in understanding any anticipated impacts the project could have on these newly listed species. There is no way for the agency to predict which projects will be affected, but this review requires approximately four hours of staff time per project and would cost an estimated \$244 per project ($\$61/\text{hr} \times 4 \text{ hrs}/\text{project} = \$244/\text{project}$).

The WRC jointly administers the Wildlife Conservation Lands Program (WCLP) with local County Tax Assessors. This program is a property tax deferral program for private landowners who manage their property as wildlife reserve land or to conserve identified priority wildlife habitats and listed species.¹⁰ Established in 2008, the program has provided the opportunity for

⁷ Costs obtained from staff – based on gopher frog recovery efforts 1/2024.

⁸ <http://www.ncwildlife.org/Plan>

⁹ 15A NCAC 10I .0102

¹⁰ G.S. 105-277.15. Taxation of wildlife conservation land.

400 landowners in 68 counties across the state to conserve and manage 25,000 acres of land for the benefit of North Carolina's wildlife species.¹¹ Landowners who participate may voluntarily enter into a Wildlife Habitat Conservation Agreement with the WRC, provided that they have a minimum of 20 contiguous acres of qualifying habitat and have owned the property for a minimum of four years. The WRC provides free technical guidance and develops the required management agreement free of charge for interested landowners to submit to their county offices. Additionally, the WRC is available to assist the County with on-site audits for those currently enrolled and answer questions. While the agency cannot accurately estimate the number of new landowners who will be eligible and want to participate in the program because of the three newly listed species, the estimated cost to the agency is \$600 per project ($\$50/\text{hr}^{12} \times 12 \text{ hrs/project} = \$600/\text{project}$).

Private Impact

The proposed amendments to the 10I Rules are expected to have minimal economic impacts to individuals.

Any individual who wishes to collect or study a species on the protected animal list is required to apply for and obtain a collection license and an endangered species permit. There is a \$10 fee for each. The project scope must be submitted by the applicant and approved by agency staff and requires that the applicant supply the following information: project description, dates for the project, list of expertise, and names of any individuals who will be assisting in collection. Depending on the species, restrictions are often placed on the project to minimize stress to a listed species. Additionally, individuals operating under endangered species permits are required to submit their project data annually if they wish to renew any of their collection permit(s). These data are valuable to the agency and assist in minimizing additional stresses on the species.

Of the species being added to the protected species list, all three may be of scientific research interest, thus requiring an endangered species permit and a collection license for study. However, it is important to note that the agency has not received any wildlife collectors permit request for these particular species to date. There is no way for the agency to estimate the potential cost without knowing what research will be conducted on these newly listed species.

The proposed listing changes will uplist one species to endangered from a lower listing level, which will impact the access to their habitat and potential for data collection. Once a species has been identified as having significant population declines or other threats, the agency works hard to limit the number of disturbances in and around their habitat, which often results in limiting the number of collection permits issued and thus, the opportunities for studies to be performed on these species.

Though three new species will be added to the protected species list, these additions cannot affect the use or development of any private property per G.S. 113-333(c). However, developers will be required to assess projects for any potential impacts to listed species as part of the permit application process for development. All currently available species data are available from the Natural Heritage website for a fee of \$100 per project or \$600 for unlimited

¹¹ Personal correspondence with agency staff 01/18/2024.

¹² Represents the midpoint hourly salary of a Conservation Biologist I.

use.¹³ Data are currently available for all three of these newly listed species. The developer is responsible for the cost of obtaining data.

In cases where there are intended (illegal take) and/or unintended (environmental) impacts to wildlife, individuals may be cited for the disturbance and charged a replacement cost for the species lost. The replacement cost for an endangered, threatened, or special concern mammal, bird or reptile species is \$4,960, \$4,313, and \$3,000 respectively.¹⁴ The replacement cost for an endangered, threatened, or special concern mussel is \$50.54/each, crayfish is \$50/each, and finfish is \$157.54 each. The penalty issued by the court could also include the cost of investigations and court fees. The agency has no way to estimate these costs because they vary by case and are uncommon.

III. Fiscal Impacts - Benefits

State Impact

With a mission of wildlife conservation, WRC biologists often work to predict decline of a species, as it is much easier to put restoration and recovery management in place proactively than it is to do so when the species is close to extinction. Additionally, wildlife species have diverse life histories which can heavily influence recovery efforts. As such, efforts made in year one may not be apparent until several years later. Due to these factors, early recognition of a species in decline and tiered state listing can provide for proactive, biologically sound management that ensures the conservation and wise use of nongame resources, minimizes risk of federal listing, which can put restrictions on private land, and fosters partnerships with local, state, and federal entities to manage wildlife resources.

The protected animal list is the list for nongame species that need the highest level of conservation attention and is used to guide research priorities and prioritize grant awards. In most cases, individuals must obtain a collection license and endangered species permit for listed species. While the purchase of these items does minimally benefit the state (183 permits/year x \$20/license and permit = \$3,660/year), the greater benefit is that individuals with an endangered species permit for scientific collection are required to submit their data to the agency before they can apply for any additional permits. This requirement that all NC projects benefit from data collected for species that need the highest level of conservation can guide conservation and decision-making. As such, all logged data are guaranteed to be accessible by the public for planning purposes.

The U.S. Fish and Wildlife Service (USFWS) routinely receives petitions from the public to initiate a 90-day finding to consider a species for federal listing. If there is a positive finding, then a 12-month process is initiated by USFWS, which can solicit state agency input. USFWS relies on state agencies to provide state-specific information on these species. Oftentimes, these species have already been considered or are on the protected species list. Because North Carolina's state listing process involves the collection of data, surveys, and monitoring, the information is readily available to USFWS for their federal species status review, saving the state time and money when requested by the USFWS.

There can be significant economic benefits to avoiding federal listing of a species. The

¹³ <https://ncnhde.natureserve.org/>

¹⁴ 15A NCAC 10A .1502. Replacement Costs of Wildlife Resources.

conservation value of North Carolina's state listing status may preclude the need for the species to become federally listed, which saves the state, local and private sectors both time and money. Based on FY22 endangered species state expenditure data for conservation projects specific to federally listed species, this could be a savings of anywhere from \$800 per year (piping plover) to \$18,500 per year (yellow lance mussel) in state funds.¹⁵ Additionally, avoided federal listing may preclude the delay or cancellation of major construction projects. Any project with the potential to jeopardize the existence of a federally listed species must undergo a Section 7 consultation with the USFWS that could take anywhere from one to 10 years and cost a significant amount of money.¹⁶ For example, the research study required for a NCDOT highway maintenance project with potential impacts to the northern long-eared bat in the eastern USFWS region (60 NC counties) cost the state a total of \$4 million over five years. Data were collected to help understand the species and its use of habitat to guide future conservation decisions. Currently, NCDOT is expending \$70,000 - \$100,000 per year for monitoring northern long-eared bats' response to construction activities.¹⁷

Finally, research shows that wildlife watching benefits the economy. According to a 2023 NCWRC study, over 2.9 million NC residents spent over 63 million days watching wildlife in the State in 2022. This activity resulted in an estimated combined \$4.92 billion in trip expenditures and equipment-related expenditures, resulting in a total economic impact of \$7.52 billion.¹⁸ Thus, the conservation and preservation of species can be assumed to yield substantial annual benefits to the state and local economies.

Private Impact

North Carolina residents value the opportunity to view and interact with nongame state-listed species. Individuals also value protecting these species for present and future generations, even if they will never interact with them.¹⁹ Together, the value of wildlife viewing and related recreation and the value of maintaining biodiversity are the "non-consumptive" benefits of the species protection.

The non-consumptive values of wildlife species can be estimated by measuring residents' willingness to pay for wildlife protection. Although economists and biologists have conducted many studies over the past 30 years to estimate the value of protecting threatened and endangered species, it is difficult to estimate the impact of the agency's proposed listings because benefits are species-specific and location specific. The agency is unaware of any value studies involving the species that are the subject of this rulemaking. Given the species-specific nature of the value individuals place on wildlife protection, the agency is not able to quantify the total social benefit of the proposed listing. However, the benefits are discussed below:

Science and Land Conservation

¹⁵ NC Wildlife Resources Commission. North Carolina's Federal Fiscal Year 2022 Federal and State Endangered and Threatened Species Expenditures Report. 2023.

¹⁶ <https://www.fws.gov/midwest/Endangered/section7/section7.html>

¹⁷ Personal correspondence with NCDOT staff 03/31/2022.

<https://connect.ncdot.gov/projects/construction/Pages/RRMan.aspx?Order=RR-33A>

¹⁸ NC Wildlife Resources Commission. North Carolina Outdoor Recreation Experiences Survey. 2023.

¹⁹ Wallmo, Kristy, and Daniel Lew. 2016. A comparison of regional and national values for recovering threatened and endangered marine species in the United States. *Journal of Environmental Management*, Volume 179. Accessed at <http://www.sciencedirect.com/science/article/pii/S0301479716302249>

- A variety of funding opportunities exist for conserving state listed species. These include but are not limited to, the Land and Water Conservation Trust Fund and Natural Resources Conservation Service grants. If an animal is added to the protected species list, projects that incorporate and/or provide benefit to those species receive preferential consideration for funding. Projects can be submitted by state and local governments, private organizations, and nonprofits, but overall, the implementation of these projects are a conservation benefit to North Carolina residents.
- Due to priorities set by funding sources, many projects are proposed to benefit listed species, state or federal, to qualify the project for funding. Because federally listed species often cohabitate with state listed species, the entire ecosystem benefits from these types of projects and the conservation actions that listing may provoke.
- Federally listed species are protected from “taking”, which includes habitat alteration resulting in harm to the species. Approximately two-thirds of all federally listed species have at least some of their habitat on private land, and some species have most of their habitat on private land.²⁰ Restrictions and special management considerations that may be costly to landowners are required if it is believed that a proposed development project could impact a listed species. Avoided federal listing may preclude the necessity of costly management.

Ecotourism

- Research shows that society enjoys biodiversity and there are many physical and mental benefits associated with spending time outdoors.²¹ Although the WRC does not actively collect data specific to ecotourism, the agency does partner and participate in surveys on willingness to pay.²² These surveys request participants to answer questions regarding their willingness to travel to see wildlife. Also, the NCWRC 2023 report indicated that North Carolina had 2,928,309 resident wildlife viewers ages 18 years and older in 2022.
- To the average recreationist, a more diverse and abundant wildlife population may increase recreation in an area. Not only may it increase experiences but also the quality of those experiences. There is no simple mechanism to estimate this benefit.
- Typically, when a species has been state listed it indicates rarity and difficulty for wildlife viewers to spot it. To wildlife enthusiasts, like birders, this situation may excite challenge and increase interest in any opportunity to seek the species. The result may in turn be enhanced ecotourism to an area that has known habitat for the species.

Tax Benefit

- The proposed addition of 3 species to the protected species list may create opportunities for landowners to participate in the Wildlife Conservation Lands Program for property tax deferral. This additional opportunity would only be available

²⁰ <https://www.fws.gov/sites/default/files/documents/endangered-species-act-basics-february-2023.pdf>

²¹ Sandifer, Sutton-Grier, Ward, 2015

²² Deason, Seekamp, 2015

to individuals who own property where these protected species currently live. These landowners would receive a property tax deferral from their county of residence if they enter into an agreement with the WRC to implement land management efforts to protect and enhance habitat for these protected species on their property.

This program is driven by property owners' financial situations, which vary from county to county and from landowner to landowner. Typically, participation in the Program is requested when a property's tax value is reassessed. The Program largely serves as a back-up plan for property owners looking for a tax break on property taxes. Additionally, only 1,700 (approximately 6.8%) of the 25,000 acres registered in the program are species-specific. Participation is usually based on the management of a priority habitat or qualification as Wildlife Reserve Land.

Ecological Benefit

- Although unquantifiable, the overall value added by maintaining a functional food chain cannot be overstated. Many of these species also provide natural resource benefits such as improved water quality or invasive species curtailment. When the cycle of life gets interrupted, there are ecological concerns which result in management expenses. All living things need food to survive. If their food source is limited or no longer present, they may become unhealthy or may not survive. Unhealthy wildlife can be more susceptible to disease, illness, erratic behavior, and unsafe human and wildlife interactions. All these results weigh on agency resources and time. By listing species of concern, the agency is proactively managing wildlife needs and potentially mitigating more serious negative impacts.

IV. Uncertainties

State Impact

If staff are asked to review a project with the potential to impact a listed species that has limited historical and habitat range data, staff may recommend a species survey before commenting on that project. The cost of data collection is different for each species, and without knowing potential projects that will be proposed in the coming years, the agency has no way to estimate the costs to other agencies or individuals for data collection. However, the agency can mitigate those costs by sharing all data collected both in-house and through state endangered species permits via the Natural Heritage natural resource database (www.ncnhp.org/data).

Local Impact

The proposed changes to the protected species list have the potential to increase the number of landowners who are eligible to participate in the Wildlife Conservation Lands Program. Because this is a county property tax deferral program, the landowners submit applications to the County for enrollment. The County determines the applicant's eligibility and acceptance into the program and participation is renewed annually. The proposed changes to the protected species list have the potential to increase the number of landowners who are eligible to

participate in the program, thus increasing a participating county's deferred taxes if they decide to accept a new landowner's management efforts. Counties may also incur a slight increase to the cost of program auditing to ensure the landowner is in compliance with their management plan. Unfortunately, there is no way for the agency to quantify costs, as property taxes vary by county.

The agency also assumes that there could be an increase in the number of court cases dealing with illegal take of three species being added to the protected species list. This would minimally impact the county court systems.

Private Impact

Lack of species-specific studies on North Carolina residents' willingness to pay for protection of listed species prevents WRC from estimating the total benefits of the proposed rules. However, a 2008 meta-analysis of studies valuing endangered, threatened, and rare species found that individuals value fish, marine mammals, and birds more highly than mammals and reptiles, as a group, and wildlife with consumption benefits are more highly valued than those with non-consumptive benefits alone.²³ The total benefits are dependent upon the consumptive uses (i.e., hunting or fishing) or non-consumptive uses (i.e., viewing) of the wildlife, the relative "charisma" of each species, the level of species endangerment, and participation in the Wildlife Conservation Lands program.

It is also important to note that the values of the benefits created by listing three new species and uplisting two species may be offset to some degree by the one delisted and two downlisted species. In their meta-analysis, Richardson and Loomis (2008) found that individuals are generally more willing to pay to prevent a species' extinction than they are to increase the population above the minimum viable level. This finding suggests protecting the most-threatened species could provide greater benefits than equivalent protections for less-threatened species, all else being equal. Downlisting or delisting species could indicate to North Carolina residents that the species is less threatened, therefore reducing the value of protection measures and their associated benefits. However, downlisting or delisting a species may also reduce development restrictions and state staff time costs.

The recreational and consumptive value of a listed species reflects only the economic, not the ecological, benefits of the species. The value that North Carolina residents place on species protection is limited by our incomplete understanding of the species' ecological role.²⁴

V. Economic Impact Summary

Each species is different, as are the reasons attributing to their decline. However, WRC expects the public awareness, research, and conservation efforts associated with placing a species on the protected species list to bring about awareness and management efforts that will

²³ Richardson, Leslie, and John Loomis. 2008. The Total Economic Value of Threatened, Endangered and Rare Species: An Updated Meta-Analysis. *Ecological Economics*. Volume 68. Accessed at <http://www.sciencedirect.com/science/article/pii/S0921800908004771>

²⁴ Loomis, John, and Douglas White. 1996. Economic Benefits of Rare and Endangered Species: Summary and Meta-Analysis. *Ecological Economics*, Volume 18. Accessed at <http://www.sciencedirect.com/science/article/pii/0921800996000298>

spur the public and private cooperation necessary to reverse the decline.

Private individuals will benefit from the proposed listings and associated conservation efforts because of the non-consumptive value of wildlife recreation opportunities and preserving biodiversity. Conservation efforts at a state level also reduce the probability of a species being federally listed, which could place restrictions on private land use and development. Private landowners may be eligible for the Wildlife Conservation Lands program due to the newly listed species, which would make them eligible for county tax deferment. And researchers may be eligible for additional funding opportunities for these species.

Wildlife recreation benefits our state's economy. In addition, listing or uplisting a species draws additional research funding, which benefits the state in both fees collected for collection licenses necessary to study the species and scientific data from those individuals with collection licenses and endangered species permits. Data collected by the state on listed species also saves time and money associated with the required data collection for federally listed species and the potential avoidance of federal listing of state listed species. These benefits are also realized by local governments.

Although these benefits are not quantifiable with available data, the agency expects the benefits of the proposed species listings to outweigh the costs.

In estimating the economic impact of the proposed amendments to the protected species list, the agency was able to estimate and quantify several identified costs, which are expected to include:

State

- Officer training materials: \$122 per year
- Officer patrol time, mileage, and materials and supplies for newly listed species: \$49,118 per year
- Officer court time for newly listed species cases: \$2,255 per year (\$451 per court case assuming max five cases per year)
- Development of three Species Conservation Plans: \$21,960 total one-time cost
- Development project reviews: \$1,220 per year (\$244 per project assuming five project reviews per year)
- WCLP technical guidance: \$600 per project (\$50/hr x 12 hrs/project = \$600/project)
- Endangered species permit reviews: \$22,326 per year (\$122 per permit averaging 183 permit reviews per year)
- Monitoring for three newly listed species: \$1,800 per fiscal year (\$200 - \$1,000 per species assuming an average of \$600 per species)

The cumulative State impact is estimated to be approximately \$77,695 per year, depending on number of court cases, development project reviews, and endangered species permit reviews during a fiscal year. Additionally, a one-time cost of \$21,960 will be incurred to complete 3 species conservation plans.

Local

- Tax deferment for landowners in WCLP is unquantifiable.
- Court fees for illegal take of newly listed species is unquantifiable.

Private

- Collection license fee for newly listed species is unquantifiable.
- Data collection before development projects is unquantifiable.
- Replacement costs for illegal take of newly listed species: endangered species is \$4,960, a threatened species is \$4,313, and a special concern species is \$3,000.
- Court fees for illegal take of newly listed species is unquantifiable.

Although most of the costs are uncertain or unquantifiable with available data, the agency was able to quantify several State and private costs. However, the agency expects the benefits of the proposed species listings to outweigh the costs.

**15A NCAC 10I .0102 PROTECTION OF ~~ENDANGERED/THREATENED/SPECIAL~~
ENDANGERED, THREATENED, AND SPECIAL CONCERN SPECIES**

(a) ~~No Open Season.~~ There is no open season for taking any of the species listed as endangered in Rule .0103, or threatened in Rule .0104 of this Section, except for the American alligator (*Alligator mississippiensis*) as set forth in the rules of this Chapter. ~~Unless otherwise provided in North Carolina General Statutes or the rules of this Chapter, Except as provided in Paragraphs (b) and (d) of this rule, there is no open season for taking any of the species listed as special concern in Rule in Rules .0103, .0104, or .0105 of this Section. Except as provided in Paragraphs (b), (c) and (e) of this Rule, it is unlawful to take or possess any animal listed in Rules .0103, .0104, or .0105 of this Section at any time.~~

(b) ~~Permits.~~ The Executive Director or his or her designee may issue permits to ~~take or possess an~~ take, possess, sell, propagate, transport, import, export, transfer, barter, trade, or stock endangered, threatened, or special concern species:

- (1) ~~to an individual or institution with experience and training in handling, and caring for the wildlife and in conducting a scientific study, investigation for the purpose of scientific investigation relevant to perpetuation or restoration of said species or as a part of a scientifically valid study or restoration effort; perpetuation, restoration, or management of a species;~~
- (2) ~~to a public or private educator or exhibitor who demonstrates that he or she has lawfully obtained the specimen or specimens in his or her possession, possesses the requisite equipment and expertise to care for such specimen or the specimens, and abides by the applicable caging requirements for the species set forth in 15A NCAC 10H .0302; .1404;~~
- (3) ~~to a person who lawfully possessed any such the species for more than 90 days immediately prior to the date that such the species was listed and who abides by the applicable caging requirements for the species set forth in 15A NCAC 10H .1404; .0302, provided however, that no permit shall be issued more than 90 days after the effective date of the initial listing for that species; or~~
- (4) ~~to a person with demonstrable depredation from a Special Concern Species, or the American alligator (*Alligator mississippiensis*)-mississippiensis);~~
- (5) to a licensed falconer;
- (6) to a retail or wholesale establishment whose primary function is providing scientific supplies, provided that:
 - (A) the specimens were lawfully obtained from captive populations or wild populations outside of North Carolina;
 - (B) the specimens are possessed in indoor facilities; and
 - (C) safeguards are provided during transportation to prevent accidental escape of the specimens.
- (7) to state and federal government agencies, corporate research entities, and research institutions within North Carolina provided that:
 - (A) the specimens are possessed in indoor facilities;
 - (B) safeguards are provided during transportation to prevent accidental escape of the specimens;
 - (C) the agency's or institution's Animal Care and Use Committee has approved the research protocol for the species;

(D) no specimens shall be stocked or released in the public or private waters or lands of North Carolina; and

(E) specimens shall not be transferred to any private individual.

(c) An individual may apply for an endangered species permit online at www.gooutdoorsnorthcarolina.com by providing the following information:

(1) name, address, phone number, and email;

(2) species name and quantity;

(3) proposed activities;

(4) map with specific location of activities identified, if applicable;

(5) the source of the specimens and documentation of lawful acquisition;

(6) caging or confinement plans for specimens, if applicable;

(7) applicant's qualifications and explanation of experience;

(8) research proposal, if applicable;

(9) acknowledgement that additional federal permits may be required;

(10) plans for care of specimens and copy of Institutional Animal Care and Use Committee permit, if applicable; and

(11) plans for final disposition of specimens.

(e)(d) Taking Without a Permit: The species listed in Rules .0103, .0104, and .0105 of this Section may be taken or possessed without a permit when:

(1) An individual may take an endangered, threatened, or special concern takes the species in defense of his or her own life or the lives of others.

(2) an individual has obtained a permit to take an American alligator in accordance with 15A NCAC 10B .0224.

(3) an individual possesses meat or other parts of American alligators that have been lawfully taken, possessed, or bought in a state where there is an open season for harvesting alligators and the products are marketed in packages or containers that are labeled to indicate the state in which the animals were taken and the identity, address, and lawful authority of the processor or distributor.

(4) an individual is taking or harassing a red wolf (*Canis rufus*) pursuant to the conditions in 50 CFR 17.84(c), hereby incorporated by reference, including subsequent amendments and editions, available free of charge at www.ecfr.gov.

(2)(5) A state or federal conservation officer or employee an individual who is designated by his agency to do so may, meets the requirements of G.S. 113-261, who, when acting in the course of his or her official duties, take, possess, and transport takes, possesses, or transports endangered, threatened, or special concern species if the action is necessary to:

(A) aid a sick, injured, diseased, or orphaned specimen;

(B) dispose of a dead specimen;

(C) salvage a dead specimen that may be useful for scientific study; or

(D) remove specimens that constitute a demonstrable but nonimmediate threat to human safety safety, provided the taking is done in a humane and noninjurious manner. The taking may involve injuring or killing endangered, threatened, or special concern species only if it is not possible to eliminate the threat by live-capturing and releasing-release the specimen unharmed, in a habitat that is suitable for the survival of that species.-survival.

~~(d)(e) Reporting. Any taking or possession of an Take, possession, sale, propagation, transportation, importation, exportation, transfer, barter, trade, or stocking of endangered, threatened, or special concern species under Paragraphs (b) and (e)(d) of this Rule is subject to applicable federal reporting requirements, requirements of federal law and regulations, and the reporting requirements of the permit issued by the Executive Director or permit, and applicable requirements of 15A NCAC 10B .0106(e).~~

~~(e) Exceptions.~~

- ~~(1) Notwithstanding any other provisions of this Rule, processed meat and other parts of American alligators that have been lawfully taken in a state in which there is an open season for harvesting alligators may be possessed, bought, and sold when such products are marketed in packages or containers that are labeled to indicate the state in which they were taken and the identity, address, and lawful authority of the processor or distributor.~~
- ~~(2) Raptors listed as special concern species in Rule .0105 of this Section may be taken from the wild for falconry purposes and for falconry propagation, provided that a valid North Carolina endangered species permit has been obtained as required in Paragraph (b) of this Rule.~~
- ~~(3) Captive bred raptors listed as special concern species may be bought, sold, bartered, or traded as provided in 50 CFR 21.85 when marked as required under those regulations. 50 CFR 21.85 is incorporated by reference, including subsequent amendments and editions. This document may be accessed at www.ecfr.gov at no cost.~~
- ~~(5) Importation, possession, sales, transportation, and exportation of species listed as special concern species in Rule .0105 of this Section shall be allowed under permit by retail and wholesale establishments whose primary function is providing scientific supplies for research, provided that:~~
 - ~~(A) the specimens were lawfully obtained from captive or wild populations outside of North Carolina;~~
 - ~~(B) they are possessed in indoor facilities;~~
 - ~~(C) all transportation of specimens provides safeguards adequate to prevent accidental escape; and~~
 - ~~(D) importation, possession, and sale or transfer is permitted only as listed in Parts (e)(4)(A) and (B) of this Rule.~~

~~(f) A written application to the Commission shall be required for a permit to authorize importation, and possession for the purpose of retail or wholesale sale. The application shall identify the source of the specimens and provide documentation of lawful acquisition. Applications for permits shall include plans for holding, transportation, advertisement, and sale in such detail as to allow a determination of the safeguards provided against accidental escape and sales to unauthorized individuals.~~

~~(g) Purchase, importation, and possession of special concern species within North Carolina is allowed under permit to state and federal governmental agencies, corporate research entities, and research institutions, provided that:~~

- ~~(1) sales are permitted to out of state consumers;~~
- ~~(2) the specimens will be possessed in indoor facilities and safeguards adequate to prevent accidental escape are provided during all transportation of the specimens;~~
- ~~(3) the agency's or institution's Animal Use and Care Committee has approved the research protocol for this species; and~~

- (4) ~~no specimens may be stocked or released in the public or private waters or lands of North Carolina and specimens may not be transferred to any private individual.~~

History Note: Authority G.S. 113-134; 113-291.2; 113-291.3; 113-292; 113-333;

Eff. June 11, 1977;

Amended Eff. January 1, 2013; January 1, 2012; May 1, 2009; April 1, 2003; April 1, 2001; April 1, 1997; February 1, 1994; September 1, 1989; March 1, 1981; March 17, 1978.

Temporary Amendment Eff. February 27, 2015;

Amended Eff. February 1, 2023; July 1, 2016.

15A NCAC 101 .0103 ENDANGERED SPECIES LISTED

(a) The following species of resident wildlife shall be designated as federally listed endangered species:

- (1) Amphibians: None listed.
- (2) Birds:
 - (A) Bachman's warbler (*Vermivora bachmanii*);
 - (B) Ivory-billed woodpecker (*Campephilus principalis*);
 - (C) Piping plover (*Charadrius melodus circumcinctus*);
 - (D) Red-cockaded woodpecker (*Dryobates borealis*); and
 - (E) Roseate tern (*Sterna dougallii dougallii*).
- (3) Crustacea: None listed.
- (4) Fish:
 - (A) Cape Fear shiner (~~*Notropis*~~ (*Miniellus mekistocholas*);
 - (B) Carolina madtom (*Noturus furiosus*);
 - (C) Roanoke logperch (*Percina rex*);
 - (D) Shortnose sturgeon (*Acipenser brevirostrum*), when found in inland fishing waters as defined in G.S. 113-129(9); and
 - (E) Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*), when found in inland fishing waters as defined in G.S. 113-129(9).
- (5) Mammals:
 - (A) Carolina northern flying squirrel (*Glaucomys sabrinus coloratus*);
 - (B) Eastern cougar (*Puma concolor*);
 - (C) Gray bat (*Myotis grisescens*);
 - (D) Indiana bat (*Myotis sodalis*);
 - ~~(E) Manatee (*Trichechus manatus*), when found in inland fishing waters as defined in G.S. 113-129(9); and~~
 - (E) Northern long-eared bat (*Myotis septentrionalis*); and
 - (F) Virginia big-eared bat (*Corynorhinus townsendii virginianus*).
- (6) Mollusks:
 - (A) Appalachian elktoe (*Alasmidonta raveneliana*);
 - (B) Carolina heelsplitter (*Lasmigona decorata*);
 - (C) Dwarf wedgemussel (*Alasmidonta heterodon*);
 - (D) James spinymussel (*Parvaspina collina*);
 - (E) Littlewing pearlymussel (*Pegias fabula*);
 - (F) Tan riffleshell (*Epioblasma florentina walkeri*); and
 - (G) Tar River spinymussel (*Parvaspina steinstansana*).
- (7) Reptiles:
 - (A) Kemp's ridley sea turtle (*Lepidochelys kempii*);
 - (B) ~~Atlantic hawksbill~~ Hawksbill sea turtle (*Eretmochelys imbricata*); and
 - (C) Leatherback sea turtle (*Dermochelys coriacea*).

(b) The following species of resident wildlife shall be designated as State-listed endangered species:

- (1) Amphibians:
 - (A) Gopher frog (*Rana [=Lithobates] capito*);
 - (B) Hickory Nut Gorge green salamander (*Aneides ~~caryaensis~~ caryaensis*);
 - (C) Ornate chorus frog (*Pseudacris ornata*); and

- (D) River frog (*Rana* [=*Lithobates*] *heckscheri*).
- (2) Birds:
- (A) American peregrine falcon (*Falco peregrinus anatum*);
- ~~(B)~~ Bewick's wren (*Thryomanes bewickii*);
- ~~(C)~~ (B) Common tern (*Sterna hirundo*);
- ~~(D)~~ (C) Henslow's sparrow (*Centronyx henslowii*); and
- ~~(E)~~ (D) Wayne's black-throated green warbler (*Setophaga virens waynei*).
- (3) Crustacea:
- (A) Bennett's Mill cave water slater (*Caecidotea carolinensis*); and
- (B) Waccamaw crayfish (*Procambarus braswelli*).
- (4) Fish:
- (A) Blotchside logperch (*Percina burtoni*);
- (B) Bridle shiner (*Notropis bifrenatus*);
- (C) Orangefin madtom (*Noturus gilberti*);
- (D) Paddlefish (*Polyodon spathula*);
- (E) Robust redhorse (*Moxostoma robustum*);
- (F) Rustyside sucker (*Thoburnia hamiltoni*);
- (G) Sharpnose darter (*Percina oxyrhynchus*); and
- (H) Stonecat (*Noturus flavus*).
- (5) Mammals:
- (A) Little brown bat (*Myotis lucifugus*); and
- (B) Tricolored bat (*Perimyotis subflavus*).
- (6) Mollusks:
- (A) Barrel floater (*Utterbackiana couperiana*);
- (B) Brook floater (*Alasmidonta varicosa*);
- (C) Carolina creekshell (~~*Villosa vaughaniana*~~; *Sagittunio vaughanianus*);
- (D) Fragile glyph (~~*Glyphyalimia*~~ *Pilsbryna clingmani*);
- (E) Green floater (*Lasmigona subviridis*);
- (F) Greenfield ~~rams-horn~~ ramshorn (*Helisoma eucosmium*);
- (G) Knotty elimia (*Elimia christyi*);
- (H) Longsolid (*Fusconaia subrotunda*);
- ~~(I)~~ (H) Magnificent ramshorn (*Planorbella magnifica*);
- ~~(J)~~ (I) Purple wartyback (*Cyclonaias tuberculata*);
- ~~(K)~~ (J) Savannah lilliput (*Toxolasma pullus*);
- ~~(L)~~ (K) Slippershell mussel (*Alasmidonta viridis*);
- ~~(M)~~ (L) Tennessee clubshell (*Pleurobema oviforme*);
- ~~(N)~~ (M) Tennessee heelsplitter (*Lasmigona holstonia*);
- ~~(O)~~ (N) Tennessee pigtoe (*Pleuronaia barnesiana*); and
- ~~(P)~~ (O) Yellow lampmussel (*Lampsilis cariosa*).
- (7) Reptiles:
- (A) Eastern coral snake (*Micrurus fulvius fulvius*); and
- (B) Eastern diamondback rattlesnake (*Crotalus adamanteus*); and
- (C) Mimic glass lizard (*Ophisaurus mimicus*).

*History Note: Authority G.S. 113-134; 113-333;
Eff. June 11, 1977;
Amended Eff. October 1, 2017; August 1, 2016; May 1, 2008; April 1, 2001; February 1,
1994; November 1, 1991; April 1, 1991; June 1, 1990;
Readopted Eff. October 1, 2021;
Amended Eff. February 1, 2023.*

15A NCAC 101 .0104 THREATENED SPECIES LISTED

(a) The following species of resident wildlife shall be designated as federally-listed threatened species:

- (1) Amphibians: Neuse River waterdog (*Necturus lewisi*).
- (2) Birds:
 - (A) Eastern black rail (*Laterallus jamaicensis jamaicensis*);
 - (B) Piping plover (*Charadrius melodus melodus*);
 - (C) Red knot (*Calidris canutus rufa*); and
 - (D) Wood stork (*Mycteria americana*).
- (3) Crustacea: None listed.
- (4) Fish:
 - (A) Spotfin chub (*Erimonax monachus*); and
 - (B) Waccamaw silverside (*Menidia extensa*).
- (5) Mammals: ~~Northern long-eared bat (*Myotis septentrionalis*)~~ West Indian Manatee (*Trichechus manatus*), when found in inland fishing waters as defined in G.S. 113-129(9).
- (6) Mollusks:
 - (A) Atlantic pigtoe (*Fusconaia masoni*);
 - (B) Longsolid (*Fusconaia subrotunda*);
 - ~~(B)(C)~~ Noontday globe (*Patera elarki nantahala*); and
 - ~~(C)(D)~~ Yellow lance (*Elliptio lanceolata*).
- (7) Reptiles:
 - (A) Bog turtle (*Glyptemys muhlenbergii*);
 - (B) American alligator (*Alligator mississippiensis*);
 - (C) Green sea turtle (*Chelonia mydas*); and
 - (D) Loggerhead sea turtle (*Caretta caretta*).

(b) The following species of resident wildlife are designated as State-listed threatened species:

- (1) Amphibians:
 - (A) Eastern tiger salamander (*Ambystoma tigrinum tigrinum*);
 - (B) Green salamander (*Aneides aeneus*);
 - (C) Junaluska salamander (*Eurycea junaluska*);
 - (D) Eastern long-tailed Long-tailed salamander (*Eurycea longicauda longicauda*);
 - (E) Mabee's salamander (*Ambystoma mabeei*);
 - (F) Pine Barrens tree frog (*Hyla andersonii*); and
 - (G) Wehrle's salamander (*Plethodon wehrlei*).
- (2) Birds:
 - (A) Bald eagle (*Haliaeetus leucocephalus*);
 - (B) Black skimmer (*Rynchops niger*);
 - ~~(B)(C)~~ Caspian tern (*Hydroprogne caspia*);
 - ~~(C)(D)~~ Gull-billed tern (*Gelochelidon nilotica aranea*);
 - ~~(D)(E)~~ Northern saw-whet owl (*Aegolius acadicus*); and
 - (F) Rusty blackbird (*Euphagus carolinus*).
- (3) Crustacea:
 - (A) Broad River spiny crayfish (*Cambarus spicatus*);
 - (B) French Broad crayfish (*Cambarus reburus*);
 - (C) Pamlico crayfish (*Procambarus medialis*);

- (D) Sandhills crayfish (*Procambarus pearsei*); and
 - (E) South Mountains crayfish (*Cambarus franklini*).
- (4) Fish:
- (A) Bigeye jumprock (*Moxostoma ariommum*);
 - (B) Blotched chub (*Erimystax insignis*);
 - (C) Carolina pygmy sunfish (*Elassoma boehlkei*);
 - (D) Carolina redhorse (*Moxostoma sp.*);
 - (E) Ironcolor shiner (~~*Notropis*~~ *Alburnops chalybaeus*);
 - (F) Least brook lamprey (*Lampetra aepyptera*);
 - (G) Logperch (*Percina caprodes*);
 - (H) Mimic shiner (~~*Notropis*~~ *Paranotropis volucellus*);
 - (I) Rosyface chub (*Hybopsis rubrifrons*);
 - (J) Sharphead darter (~~*Etheostoma*~~ (*Nothonotus acuticeps*));
 - (K) Santee chub (*Cyprinella zanema*);
 - (L) Sicklefin redhorse (*Moxostoma sp.*);
 - (M) Thicklip chub (*Cyprinella labrosa*);
 - (N) Turquoise darter (*Etheostoma inscriptum*); and
 - (O) Waccamaw darter (*Etheostoma perlongum*).
- (5) Mammals:
- (A) Eastern woodrat (*Neotoma floridana floridana*);
 - (B) Rafinesque's big-eared bat (*Corynorhinus rafinesquii rafinesquii*); and
 - (C) Red wolf (*Canis rufus*).
- (6) Mollusks:
- (A) Alewife floater (*Utterbackiana implicata*);
 - (B) Big-tooth covert (*Fumonelix jonesiana*);
 - (C) Cape Fear threetooth (*Triodopsis soelneri*);
 - (D) Eastern lampmussel (*Lampsilis radiata*);
 - (E) Eastern pondmussel (~~*Ligumia nasuta*~~; (*Sagittunio nasutus*));
 - (F) Engraved covert (*Fumonelix orestes*);
 - (G) Mountain creekshell (~~*Villosa*~~ (*Leaunio vanuxemensis*));
 - (H) Notched rainbow (~~*Villosa*~~ (*Venustaconcha constricta*));
 - (I) Rainbow (~~*Villosa*~~ (*Cambarunio iris*));
 - (J) Roan supercoil (*Paravitrea varidens*);
 - (K) Sculpted supercoil (*Paravitrea ternaria*);
 - (L) Smoky Mountain covert (*Inflectarius ferrissi*);
 - (M) Creeper (*Strophitus undulatus*);
 - (N) Tidewater mucket (~~*Leptodea*~~ (*Atlanticoncha ochracea*));
 - (O) Triangle floater (*Alasmidonta undulata*); and
 - (P) Waccamaw ambersnail (*Catinella waccamawensis*).
- (7) Reptiles:
- (A) Northern pine snake (*Pituophis melanoleucus melanoleucus*); and
 - (B) Southern hognose snake (*Heterodon simus*).

History Note: Authority G.S. 113-134; 113-333;

Eff. March 17, 1978;
Amended Eff. June 1, 2008; April 1, 2001; November 1, 1991; April 1, 1991; June 1, 1990;
September 1, 1989;
Temporary Amendment Eff. February 27, 2015;
Amended Eff. October 1, 2017; July 1, 2016; August 1, 2016;
Readopted Eff. October 1, 2021;
Amended Eff February 1, 2023.

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15A NCAC 101 .0105 SPECIAL CONCERN SPECIES LISTED

The following species of resident wildlife shall be designated as State-listed special concern species:

- (1) Amphibians:
 - (a) Collinse's mountain chorus frog (*Pseudacris collinsorum*);
 - (b) Crevice salamander (*Plethodon longicrus*);
 - (c) Dwarf salamander (*Eurycea quadridigitata*);
 - (d) Dwarf black-bellied salamander (*Desmognathus folkertsi*);
 - (e) Eastern hellbender (*Cryptobranchus alleganiensis alleganiensis*);
 - (f) Four-toed salamander (*Hemidactylium scutatum*);
 - (g) Gray treefrog (*Hyla versicolor*);
 - (h) Mole salamander (*Ambystoma talpoideum*);
 - (i) Mudpuppy (*Necturus maculosus*);
 - (j) Southern chorus frog (*Pseudacris nigrita*);
 - (k) Southern zigzag salamander (*Plethodon ventralis*); and
 - (l) Weller's salamander (*Plethodon welleri*).
- (2) Birds:
 - (a) American oystercatcher (*Haematopus palliatus*);
 - (b) Bachman's sparrow (*Peucaea aestivalis*);
 - (c) Barn owl (*Tyto alba*);
 - (d) Black-capped chickadee (*Poecile atricapillus*);
 - ~~(e)~~ Black skimmer (*Rynchops niger*);
 - ~~(f)~~(e) Brown creeper (*Certhia americana nigrescens*);
 - ~~(g)~~(f) Cerulean warbler (*Setophaga cerulea*);
 - ~~(h)~~(g) Glossy ibis (*Plegadis falcinellus*);
 - ~~(i)~~(h) Golden-winged warbler (*Vermivora chrysoptera*);
 - ~~(j)~~(i) Least bittern (*Ixobrychus exilis*);
 - ~~(k)~~(j) Least tern (*Sternula antillarum*);
 - ~~(l)~~(k) Little blue heron (*Egretta caerulea*);
 - ~~(m)~~(l) Loggerhead shrike (*Lanius ludovicianus*);
 - ~~(n)~~(m) Painted bunting (*Passerina ciris*);
 - ~~(o)~~(n) Red crossbill (*Loxia curvirostra*);
 - ~~(p)~~(o) Snowy egret (*Egretta thula*);
 - (p) Swallow-tailed kite (*Elanoides forficatus*);
 - (q) Tricolored heron (*Egretta tricolor*);
 - ~~(r)~~(q) Vesper sparrow (*Pooecetes gramineus*); and
 - ~~(s)~~(r) Wilson's plover (*Charadrius wilsonia*).
- (3) Crustacea:
 - (a) Carolina skistodiptomus (*Skistodiptomus carolinensis*);
 - (b) Carolina well diacyclops (*Diacyclops jeannelli putei*);
 - (c) Chowanoke crayfish (*Faxonius virginianus*);
 - (d) Graceful clam shrimp (*Lynceus gracilicornis*);
 - (e) Greensboro burrowing crayfish (*Cambarus catagius*);
 - (f) Hiwassee headwaters crayfish (*Cambarus parrishi*);
 - (g) Little Tennessee River crayfish (*Cambarus georgiae*);

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- (h) North Carolina spiny crayfish (*Faxonius carolinensis*); and
 - (i) Oconee stream crayfish (*Cambarus chaugaensis*).
- (4) Fish:
- (a) American brook lamprey (*Lethenteron appendix*);
 - (b) "Atlantic" Highfin carpsucker (*Carpionodes sp. cf. velifer*);
 - (c) Banded sculpin (*Cottus carolinae*);
 - (d) Blue Ridge sculpin (*Cottus caeruleomentum*);
 - (e) Blueside darter (*Etheostoma jessiae*);
 - (f) Broadtail madtom (*Noturus sp.*);
 - (g) Carolina darter (*Etheostoma collis*);
 - (h) Cutlip minnow (*Exoglossum maxillingua*);
 - (i) Freshwater drum (*Aplodinotus grunniens*);
 - (j) Kanawha minnow (*Phenacobius teretulus*);
 - (k) Lake sturgeon (*Acipenser fulvescens*);
 - (l) Least killifish (*Heterandria formosa*);
 - (m) Mooneye (*Hiodon tergisus*);
 - (n) Mountain madtom (*Noturus eleutherus*);
 - (o) Ohio lamprey (*Ichthyomyzon bdellium*);
 - (p) Olive darter (*Percina squamata*);
 - (q) Pinewoods darter (*Etheostoma mariae*);
 - (r) River carpsucker (*Carpionodes carpio*);
 - (s) Sandhills chub (*Semotilus lumbee*);
 - (t) Seagreen darter (*Etheostoma thalassinum*);
 - (u) Sickie darter (*Percina williamsi*);
 - (v) Smoky dace (*Clinostomus sp.*);
 - (w) Sooty-banded darter (*Percina westfalli*);
 - ~~(w)(x)~~ Striped shiner (*Luxilus chrysocephalus*);
 - ~~(x)(y)~~ Snubnose darter (*Etheostoma simoterum*);
 - ~~(y)(z)~~ "Thinlip" chub (*Cyprinella sp. cf. zanema*);
 - ~~(z)(aa)~~ Waccamaw killifish (*Fundulus waccamensis*);
 - ~~(aa)~~ ~~Westfall's darter (*Percina westfalli*)~~;
 - (bb) Wounded darter (~~*Etheostoma vulneratum*~~); (*Nothonotus vulneratus*); and
 - (cc) Yellowfin shiner (~~*Notropis*~~*Hydrophlox lutipinnis*).
- (5) Mammals:
- (a) Allegheny woodrat (*Neotoma magister*);
 - (b) Buxton Woods white-footed mouse (*Peromyscus leucopus buxtoni*);
 - (c) Coleman's oldfield mouse (*Peromyscus polionotus colemani*);
 - (d) Eastern big-eared bat (*Corynorhinus rafinesquii macrotis*);
 - (e) Eastern small-footed bat (*Myotis leibii leibii*);
 - (f) Florida yellow bat (*Lasiurus intermedius floridanus*);
 - (g) Southeastern bat (*Myotis austroriparius*);
 - (h) Southern rock vole (*Microtus chrotorrhinus carolinensis*); and
 - (i) Star-nosed mole (*Condylura cristata parva*).
- (6) Mollusks:

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- (a) Appalachian gloss (*Zonitoides patuloides*);
 - (b) Bidentate dome (*Ventridens coelaxis*);
 - (c) Black mantleslug (*Pallifera hemphilli*);
 - (d) Blackwater ancylid (*Ferrissia hendersoni*);
 - (e) Blue-foot lancetooth (*Haplotrema kendeighi*);
 - (f) Cape Fear spike (*Elliptio marsupiobesa*);
 - (g) Clingman covert (*Fumonelix wheatleyi clingmanicus*);
 - (h) Dark glyph (*Glyphyalinia junaluskana*);
 - (i) Dwarf proud globe (*Patera clarki clarki*);
 - (j) Dwarf threetooth (*Triodopsis fulciden*);
 - (k) Fringed coil (*Helicodiscus fimbriatus*);
 - (l) Glossy supercoil (*Paravitrea placentula*);
 - (m) Great Smoky slitmouth (*Stenotrema depilatum*);
 - (n) High mountain supercoil (*Paravitrea andrewsae*);
 - (o) Honey glyph (*Glyphyalinia vanattai*);
 - (p) Lamellate supercoil (*Paravitrea lamellidens*);
 - (q) Mirey Ridge supercoil (*Paravitrea clappi*);
 - (r) Open supercoil (*Paravitrea umbilicaris*);
 - (s) Pink glyph (*Glyphyalinia pentadelphica*);
 - (t) Pink heelsplitter, *Potamilus alatus*;
 - ~~(u)~~ Pod lance (*Elliptio folliculata*);
 - ~~(v)~~ Queen crater (*Appalachina chillhoweensis*);
 - ~~(w)~~ Ramp Cove supercoil (*Paravitrea lacteodens*);
 - ~~(x)~~ Ridged lioplax (*Lioplax subcarinata*);
 - ~~(y)~~ Roanoke slabshell (*Elliptio roanokensis*);
 - ~~(z)~~ Saw-tooth disc (*Discus bryanti*);
 - ~~(aa)~~ Seep mudalia (*Leptoxis dilatata*);
 - ~~(bb)~~ Spike (*Eurynia dilatata*);
 - ~~(cc)~~ Spiral coil (*Helicodiscus bonamicus*);
 - ~~(dd)~~ Velvet covert (*Inflectarius subpalliatus*);
 - ~~(ee)~~ Waccamaw amnicola (*Amnicola* sp.);
 - ~~(ff)~~ Waccamaw siltsnail (*Cincinnatia* sp.); and
 - ~~(gg)~~ Wavy-rayed lampmussel (*Lampsilis fasciola*).
- (7) Reptiles:
- (a) Carolina pigmy rattlesnake (*Sistrurus miliarius miliarius*);
 - (b) Carolina swamp snake (*Liodytes pygaea paludis*);
 - (c) Carolina watersnake (*Nerodia sipedon williamengelsi*);
 - (d) Cumberland slider (*Trachemys scripta troostii*);
 - (e) Diamondback terrapin (*Malaclemys terrapin*);
 - (f) Eastern chicken turtle (*Deirochelys reticularia reticularia*);
 - (g) Eastern coachwhip (*Coluber* ~~(=*Masticophis*)~~ [=*Masticophis*] *flagellum flagellum*);
 - (h) Eastern slender glass lizard (*Ophisaurus attenuatus longicaudus*);
 - (i) Eastern spiny softshell (*Apalone spinifera spinifera*);
 - (j) Northern map turtle (*Graptemys geographica*);

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- (k) Outer Banks kingsnake (*Lampropeltis getula sticticeps*);
- (l) Stripeneck musk turtle (*Sternotherus ~~minor~~ peltifer*); and
- (m) Timber rattlesnake (*Crotalus horridus*).

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