



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

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

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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 WRC has been granted rulemaking authority to implement the provisions of these statutes (G.S. 113-134).

As part of its mission, 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. Lists are amended from time to time, in response to public proposals 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 in order to accomplish the objectives of managing wildlife resources through sound conservation. The WRC also adopts and implements conservation programs for endangered, threatened and special concern species to limit, regulate, or prevent the taking, collection or sale of protected species (G.S. 113-333). The management goal with any state listing is to ensure the stability of a species for long term viability.

The process for updating the state listing involves a multi-year, transparent process defined by science-based decision making. Per G.S. 113-335, the Nongame Wildlife Advisory Committee (NWAC) is the panel of experts from scientific disciplines who review scientific evidence and submit their state listing recommendations to the Commission. 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 actual 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 is below, with the full 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 that conservation techniques can be developed for them, and their population numbers are enhanced. An endangered species is one whose continued existence has been determined to be in jeopardy in the state. A threatened species is one who is likely to become endangered within the foreseeable future throughout all of, or at least 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 64 candidate species in a report from the Scientific Council approved by NWAC, the WRC recommends to add 14 species, remove 7 species, and change the status of 16 species on the protected species list. The proposed list highlights species that meet the definition of endangered, threatened, or special concern. A complete list of proposed changes and summarized data on each species can be found in Appendix B.

The proposed changes to the state listing include an additional three species to be listed as endangered, three species to be listed as threatened, and eight species to be listed as special concern. Overall, there will be a total of 37 changes to the 15A NCAC 10I – Endangered and Threatened Species Rules due to additions, removals, and shifting of species between lists. The goal of these listing 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 and/or decline in population, 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 direct 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.

II. Fiscal Impacts - Costs¹

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 - .0105.² To enforce this law, WRC requires all new wildlife enforcement officers to participate in an agency training that includes a one-day review of regulations and field identification specifically for nongame and state listed species. This training includes 8 hours of information on the illegal pet trade, collection, and food market, and teaches officers accurate species identification. Additionally, routine refresher trainings are offered, which include information on nongame species that may have had an increased number of 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. This will be a one-time cost to the agency of \$74 ($\$37/\text{hr} \times 2\text{hrs} = \74).

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) 2015 and FY 2016, less than one percent of each officer's time is spent on nongame specific activities.³ These activities include routine patrols for violations, responding to wildlife vs. human interactions and complaints, assisting biologists with complaints, following leads from citizens, and investigating actual crimes. Over the past two fiscal years, this has accounted for an average of 5,544 hours/FY. There are over 1,000 nongame species in NC with two hundred and five (205) nongame being state listed as of FY 2015. For the purpose of estimating additional costs to the agency from the 14 newly listed species, it is assumed that about one fourth of the 5,544 hours, 1,386 hours ($5,544\text{hrs}/4 = 1,386$ hours) spent patrolling in the last two fiscal years was specific to listed species. While it is not anticipated that the addition of 14 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 and time spent addressing any illegal activity, is estimated to cost the agency \$45,738/FY ($\$33/\text{hr} \times 1386$ hrs/FY). If there is an increase in illegal activity, this cost could increase. However, it is not possible to predict the potential change in illegal activity at this time.

Additionally, each person convicted of unlawful activities with a species on the protected species list is guilty of a Class I misdemeanor. In FY 2016 there were a total of 14 nongame court cases. There were 12 in FY 2015. In 2015 five of those cases involved the unlawful possession of an

¹ All hourly rates for agency staff herein reflect total compensation.

² G.S. 113-337. Unlawful acts; penalties.

³ Personal correspondence with law enforcement staff 12/2016.

animal on the protected species list, but there were none in 2016 (average of 2.5 court cases for listed species per year).⁴ A typical court case for a listed species requires approximately 11 hours of officer time. Based on the available data, the agency incurs a cost of \$363 per court case (\$33/hr x 11 hrs/case = \$363 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, 7 species will require new management plans, at an estimated cost to the agency of \$10,360 (\$37/hr x 40hrs/plan = \$1,480/plan; \$1,480/plan x 7 plans = \$10,360). It is estimated that it will take the agency 12 months to develop these plans.

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 \$1000 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 any additional data. On the other hand, if a more extensive management effort were required, for example 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.⁵ Although the Wildlife Action Plan summarizes recovery techniques for priority species, the conservation plans will provide more details specific by species.⁶

Any individual who wishes to collect a nongame species for research purposes is required to obtain a collection license.⁷ Collection of a listed species, also requires an endangered species permit. Staff review endangered species permit applications before they are issued. This review requires approximately 2 hours to complete, at a cost to the agency of \$74 per permit (\$37/hr x 2 hrs/permit = \$74/permit). Listing or uplisting a species increases the likelihood that researchers will target 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 14 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, since 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,

⁴ Personal correspondence with law enforcement staff 12/2016.

⁵ Costs obtained from staff – based on Gopher frog recovery efforts 1/2017.

⁶ <http://www.ncwildlife.org/Plan>

⁷ 15A NCAC 10I .0102

but this review requires approximately two hours of staff time per project and would cost an estimated \$74 ($\$37/\text{hr} \times 2 \text{ hrs/project} = \$74/\text{project}$).

The WRC jointly administers the Wildlife Conservation Lands Program with local County Tax Assessors. This program is a property tax deferral program for private landowners who manage their property to conserve identified priority wildlife habitats and listed species.⁸ Established in 2008, the program has provided the opportunity for 110 landowners in 38 counties across the state to conserve and manage 5,402 acres of land for the benefit of North Carolina priority wildlife species.⁹ Landowners that identify priority habitats or species on their land 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 5 years. The WRC provides free technical guidance and develops the required management plans free of charge for interested landowners to submit to their county offices. Additionally, the WRC is available to assist the County in 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, the estimated cost to the agency is \$592 per project ($\$37/\text{hr} \times 16 \text{ hrs/project} = \$592/\text{project}$).

Private Impact

The proposed amendments to the 10I Rules are expected to have minimal private impacts. Per G.S. 113-337(a)(1), it is unlawful to take any animal on the protected species list. Because all of the proposed species are nongame, the changes are not anticipated to impact hunting, fishing or trapping.

Any individual who wishes to collect a nongame species for research purposes is required to obtain a collection license.¹⁰ Collection of a listed species, also requires an endangered species permit. The nongame wildlife collection licenses are \$5 each, and require that the applicant supply the following information: project description, dates for the project, list of expertise and names of any individuals that will be assisting in collection. There is no fee for the endangered species permit, but the project scope must be submitted and approved by agency staff. 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 permits. This data is valuable to the agency and assists in minimizing additional stresses on the species.

Based on 2014 through 2016 data, the agency has issued, on average, 382 wildlife collection license and 256 endangered species permits each year.¹¹ Though the agency is unable to predict the exact number of permits that will be issued for the newly listed species, private individuals who wish to collect or study species on the protected list will incur a minimal cost of \$5 per year to do so. Of the species being added to the protected species list, all 14 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

⁸ G.S. 105-277.15. Taxation of wildlife conservation land.

⁹ Personal correspondence with agency staff 12/2016

¹⁰ 15A NCAC 10I .0102

¹¹ Personal correspondence with RAPS staff 12/2016.

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 5 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 amount 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 14 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 is available free of charge on the Natural Heritage website and applicants can request free assistance in interpreting the data at any time. However, if data do not exist on a particular species, a survey may need to be completed, at the developer's expense, before the project begins. A site survey for a species is nominal to the developer compared to the total expense of a project. The costs associated with the survey are typically absorbed into other scoping, survey or environmental fees that developers plan for as part of the site development. Data are currently available for three of the 14 newly listed species. The cost of data collection would vary depending on the species.

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 species is \$4,960, a threatened species is \$4,313, and a special concern species is \$54.¹² The penalty issued by the court could also include the cost of investigations and court fees.

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 proactively put restoration and recovery management in place than it is 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. Individuals must obtain a wildlife collection license (\$5) and endangered species permit for any non-game listed species. While the purchase of these licenses do minimally benefit the state, the greater benefit is that individuals with an endangered species permit for scientific collection are

¹² 15A NCAC 10B .0117. Replacement Costs of Wildlife Resources.

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 (UFWS) routinely receives petitions from the public to initiate a 90-day finding to consider a species for federal listing. If this results in a positive finding, then a 12-month process is initiated by UFWS which can solicit state agency input. UFWS 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 UFWS for their federal species status review, saving the state time and money when requested by the UFWS.

There can be significant economic benefits to avoiding federal listing of a species. The 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 2015 endangered species state expenditure data for conservation projects specific to federally listed species, this could be a savings of anywhere from \$2,500 per year (gray bat) to \$1,142,843 per year (red-cockaded woodpecker) in state funds.¹³ Additionally, avoided federal listing may preclude the delay or cancelation 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.¹⁴ 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 \$400,000 per year for 5 years. Data were collected to help understand the species and its use of habitat to guide future conservation decisions.¹⁵

Research shows that wildlife watching benefits the economy. According to a 2011 UFWS report, thirty percent of the U.S. population 16 years of age and older enjoy closely observing, feeding, and photographing wildlife (wildlife watching).¹⁶ Of those, 72 million individuals, 96 percent, observed wildlife around their homes, and 31 percent took trips away from home to watch. In addition to contributing significantly to people's enjoyment of the outdoors, wildlife watching has a substantial impact on the nation's economies. Specific to North Carolina, a 2011 UFWS and Census Bureau report indicated over 2.4 million residents and non-residents engaged in wildlife watching within the state. The almost \$930 million spent in trip and equipment related expenditures substantially contributed to the state and local economies. The report stated that North Carolina had 2,432,000 recorded wildlife watchers ages 16 years and older.¹⁷ Thus, the conservation and preservation of species can be assumed to yield substantial annual benefits to the state.

¹³ <http://ecos.fws.gov/expenditures>

¹⁴ <https://www.fws.gov/midwest/Endangered/section7/section7.html>

¹⁵ Personal correspondence with NCDOT staff 2/2017

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

¹⁶ http://insidewrc.org/div09_management/documents/FWS-021SurveyReport2011-2WildlifeWatching-FINAL.pdf.

¹⁷ <http://www.census.gov/prod/2013pubs/fhw11-nc.pdf>

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.¹⁸ 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 37 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

- A variety of funding opportunities exist for conserving state listed species. These include but are not limited to, the Clean Water Management Trust Fund, and Natural Resources Conservation Service. 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, in order 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. It is estimated that approximately half of all federally listed species have at least 80 percent of their habitat on private land.¹⁹ 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.²⁰ Although the WRC does not actively

¹⁸ 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>

¹⁹ <https://www.fws.gov/endangered/esa-library/pdf/landowners.pdf>

²⁰ Sandifer, Sutton-Grier, Ward, 2015

collect data specific to ecotourism, the agency does partner and participate in surveys on willingness to pay.²¹ These surveys request participants to answer questions regarding their willingness to travel to see wildlife. Also, the UFWs 2011 report indicated that North Carolina had 2,432,000 recorded wildlife watchers ages 16 years and older.²²

- 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. WRC expects this to be the case for four newly listed species due to their unique physical appearance and/or rarity (Ornate chorus frog, Mabee's salamander, Carolina swamp snake and Caspian tern), and two species that are unique looking and have an interesting life cycle/migration (Wayne's black-throated green warbler and Eastern chicken turtle).

Tax Benefit

- The proposed addition of 14 species to the protected species list may create opportunities for landowners to participate in the Wildlife Conservation Lands program for county tax deferral. This opportunity would only be available to individuals who own priority habitat that meets the minimum requirements for participation in the program, and implement land management efforts that benefit species of concern. These landowners would receive a deferred tax break from county land taxes to implement land management efforts on their property.

This program is driven by property owner's 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 1,064 (approximately 20%) of the 5,402 acres registered in the program are species-specific. Participation is usually based on the presence of qualifying habitat.

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 of 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.

²¹ Deason, Seekamp, 2015

²² http://insidewrc.org/div09_management/documents/FWS-021SurveyReport2011-2WildlifeWatching-FINAL.pdf.

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 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 is able to 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 has 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 make application with 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 has 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 14 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 14 new species and uplisting 9 species may be offset to some degree by the 7 delisted and 7 downlisted species. In their meta-analysis, Richardson and Loomis found that individuals are generally more willing to

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>

pay to prevent a species' extinction than they are to increase the population above the minimum viable level.²⁴ 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.²⁵

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 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.

²⁴ 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>

²⁵ 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>

In estimating the economic impact of the proposed amendments to the protected species list, the agency was unable to quantify most of the identified costs, which are expected to include:

State

- Officer patrol time for newly listed species
- Officer court time for newly listed species cases
- Development project review
- Endangered species permit review
- Monitoring for 7 newly listed species

Local

- Tax deferment for landowners in WCLP

Private

- Collection license fee for newly listed species
- Data collection prior to development projects
- Replacement costs for illegal take of newly listed species
- Court fees for illegal take of newly listed species.

Although most of the costs are not quantifiable with available data, the agency was able to quantify training material development (\$74) and Conservation Plan development for the 7 newly listed species (\$10,360), and estimates a cost of approximately \$10,434 in year one. Again, the agency expects the benefits of the proposed species listings to outweigh the costs.