



◻ North Carolina Wildlife Resources Commission ◻

Gordon Myers, Executive Director

March 1, 2016

Honorable Jimmy Dixon
N.C. House of Representatives
300 N. Salisbury Street, Room 416B
Raleigh, NC 27603-5925

Honorable Chuck McGrady
N.C. House of Representatives
300 N. Salisbury Street, Room 304
Raleigh, NC 27603-5925

Senator Trudy Wade
N.C. Senate
300 N. Salisbury Street, Room 521
Raleigh, NC 27603-5925

Dear Honorables:

I am submitting this report to the Environmental Review Committee in fulfillment of the requirements of Section 4.33 of Session Law 2015-286 (H765). As directed, this report includes a review of methods and criteria used by the NC Wildlife Resources Commission on the State protected animal list as defined in G.S. 113-331 and compares them to federal and state agencies in the region. This report also reviews North Carolina policies specific to introduced species along with determining recommendations for improvements to these policies among state and federally listed species as well as nonlisted animals.

If you have questions or need additional information, please contact me by phone at (919) 707-0151 or via email at gordon.myers@ncwildlife.org.

Sincerely,

A handwritten signature in black ink that reads "Gordon S. Myers". The signature is fluid and cursive.

Gordon Myers
Executive Director

**North Carolina Wildlife Resources Commission
Report on Study Conducted Pursuant to S.L. 2015-286
To the Environmental Review Commission
March 1, 2016**

Section 4.33 of Session Law 2015-286 (H765) directed the N.C. Wildlife Resources Commission (WRC) to “review the methods and criteria by which it adds, removes, or changes the status of animals on the state protected animal list as defined in G.S. 113-331 and compare these to federal regulations and the methods and criteria of other states in the region. The Commission shall also review the policies by which the state addresses introduced species and make recommendations for improving these policies, including impacts associated with hybridization that occurs among federally listed, state listed, and nonlisted animals.” Herein, we satisfy those reporting requirements.

Executive Summary

The North Carolina Wildlife Resources Commission (WRC) protects and manages the fish and wildlife resources of the state, including game and nongame species. Explicit direction is to “manage, restore, develop, cultivate, conserve, protect, and regulate the wildlife resources of the State of North Carolina.” WRC is also charged with protecting and conserving endangered and threatened wildlife resources, and has the authority to designate species as endangered, threatened, or of special concern species.

There are two components of WRC’s listing process, one related to the legal aspects of the process and one concerning the scientific merit of listing a species. In both aspects, agency policy guides final listing decisions. The procedural framework of listing a species in North Carolina is set out in G.S. 113-334 through 113-336. The WRC charges a Nongame Wildlife Advisory Committee (NWAC) to evaluate the need for and recommend changes in listing status.

This report compares North Carolina’s listing process to both the federal system and to those of nearby states. The US Fish and Wildlife Service (USFWS) uses information provided by states to inform the federal listing process, including Wildlife Action Plans and Natural Heritage Program databases. They also use an evaluation tool called the Species Status Assessment (SSA) to better inform and document its decisions.

In comparison with the federal government, North Carolina and each nearby state examined have their own processes for determining whether or not a species qualifies for listing in the State Endangered and Threatened Species List (SESL). All states rely upon expert biological input to evaluate available information and make informed recommendations to rulemaking boards or commissions. Two sources of information for species status evaluations are employed by some states, but not by the federal government. These evaluations are the International Union for the Conservation of Nature (IUCN) and NatureServe status assessment systems. Both systems use sets of population and habitat factors to assess risk of extinction. Every state examined uses the expertise of staff and assembled taxa experts to make final recommendations for additions or deletions to its SESL. In every case, formal procedures by the state's rulemaking body are required to list or delist a species on its SESL.

G.S. 113 Article 25 adopted by the General Assembly in 1987 improved the conservation of declining native species in North Carolina. WRC is actively working with the USFWS to reverse the declining trends of other North Carolina native species. Reintroductions have helped remove species from the Federal Endangered Species List (FESL), thereby reducing management costs for those species and adverse impact to landowners and businesses. Recent reintroduction attempts by WRC demonstrate current conservation activities to recover three aquatic disappearing species, Cape Fear shiner (*Notropis mekistocholas*), Carolina heelsplitter (*Lasmigona decorata*), and sicklefin redhorse (*Moxostoma sp.*).

Comparisons of past introductions of wildlife in North Carolina reveal points important to consider when contemplating new projects. North Carolina does not have a single written policy governing all introductions of wildlife. Instead, the WRC develops policies in response to specific introduction proposals or events. Current WRC policy requires staff to request approval of the Wildlife Commissioners whenever introductions of listed or candidate species are made to new locations within the state, even when the species already exists within the state.

This review of North Carolina's methods and criteria to administer protected animal lists as defined in G.S. 113-331 and the policies to address introduced species suggest several potential improvements included in the recommendations in this report:

1. Expand the application of the WRC's augmentation policy;
2. Expand conservation collaborations with state wildlife agencies to forestall federal listings; and
3. Collaboratively implement the newly completed North Carolina Aquatic Nuisance Species Plan.

1. Background

The North Carolina Wildlife Resources Commission (WRC) is charged with protecting and managing the fish and wildlife resources of the state ([G.S. 143-239](#)), including game and nongame species ([G.S. 113-129](#)). G.S. 113 Article 25 was added (Appendix A) in 1987. It charged the WRC with protecting and conserving endangered and threatened wild animals and established the process to list species. G.S. 113 Article 25 generally mirrored the federal Endangered Species Act (ESA) ([16 U.S.C 1531 et seq.](#)), but with several differences which are explained in more detail herein. Part of the impetus for G.S. 113 Article 25 was a 1977 cooperative agreement (Appendix B) between the U.S. Fish and Wildlife Service (USFWS) and the WRC that required sharing of state and federal lists between the agencies. The cooperative agreement is required by CFR 50, Part 81, which stipulated that a state cannot obtain federal funds for endangered species projects without entering into a cooperative agreement.

The first Protected Animal List codified in rule under G.S. 113 Article 25 was created from 1989–1991 and contained 43 endangered, 56 threatened, and 103 special concern species. Since then the Protected Animal List has been updated and amended in 1994, 2001, 2002, and 2008. Currently, there are 58 endangered, 52 threatened, and 129 special concern species listed in North Carolina.

The WRC has been given stewardship authority of all fish and wildlife resources ([G.S. 113-131](#)) and directed to “manage, restore, develop, cultivate, conserve, protect, and regulate the wildlife resources of the State of North Carolina” ([G.S. 143-239](#)). While many North Carolina native species of fish and wildlife are abundant, quite a few species are at risk of extirpation because of human activity. Although some species can tolerate these activities, other species are vulnerable to extirpation due to their biology, such as naturally low numbers, restricted range, low mobility and disease. Those species that occur in North Carolina and are at risk of extinction at a national level are afforded protection under the ESA. However, in North Carolina there are many vulnerable species, including endemics (found only or primarily in the state), that are not protected by the federal law. Therefore, the General Assembly has declared it is the policy of the state to protect, conserve, and enhance endangered, threatened and special concern species ([G.S. 113-332](#)). The WRC has incorporated these foundational policies into its [2010 Strategic Plan](#). Goals 3 and 4 of the Strategic Plan clearly articulate the WRC’s commitment to endangered species protection. One of the primary means of implementing these goals is through the recently completed [North Carolina Wildlife Action Plan](#) which aims to keep common species common and to protect and recover rare species.

- Goal 3: Conserve and enhance the abundance and diversity of the fish and wildlife resources of North Carolina
- Goal 4: Provide leadership in sustaining working lands, conserving wildlife habitats and species diversity, and in maintaining the hunting and fishing heritage of North Carolina.

The basic purpose of both the ESA and G.S. 113 Article 25 is to protect and conserve those species at risk so that the endangered ones are not extirpated and the threatened and special concern ones do not become rarer. Another purpose is to direct survey efforts toward obscure species to assess populations and to determine if listing is warranted. The overall goal is to recover declining species to the point that they can be delisted and sustained in the wild.

In addition to the general authority under G.S. 143-239 to manage and protect fish and wildlife, G.S. 113 Article 25 gives the WRC specific authority to designate and regulate endangered, threatened, and special concern species and is codified in regulations 15A NCAC 10I (Appendix C).

2. Methods and Criteria for Adding, Removing or Changing Listed Species in North Carolina

There are two components of the listing process, one related to the legal procedural framework and one concerning the scientific merit of listing a species. In both aspects, agency policy guides final listing decisions.

Legal Framework and Process

The legal procedural framework of listing a species in North Carolina is set out in G.S. 113-334 through 113-336 and administered by WRC. The WRC's Resolution Regarding the [Nongame Advisory Committee](#) (Appendix D) and the Nongame Wildlife Advisory Committee Procedures and Schedule (Appendix E) provide additional procedural and decision-making information.

The NWAC was created in 1983 to provide the knowledge and perspectives of taxonomic experts in academic and other entities. The NWAC was composed of knowledgeable citizens of North Carolina who widely represent agencies, businesses, and other stakeholder interests in the state (Appendix F). Its responsibility was to advise the WRC on matters related to conservation of nongame wildlife, including creation of the protected animal list. The WRC had limited staff and funding dedicated to the conservation of more than 1,000 nongame vertebrate species across North Carolina. The NWAC enabled the WRC to draw expertise from a larger group which reduced costs and created valuable collaborations within the state. Since the 1980s, the WRC has added significantly to its nongame and endangered species staff and has likewise grown in expertise through years of surveys, monitoring, and research on hundreds of species.

NWAC members are currently selected through a peer nomination process and ultimately approved by the WRC based on taxa expertise, experience within North Carolina, and professional affiliations. NWAC continues to assist in the WRC listing process and serve as a stakeholder voice for the North Carolina Wildlife Action Plan, which is a federally required plan to secure State Wildlife Grant funding for nongame species, many of which are not federally or state listed.

The process to list a species in North Carolina includes multiple steps:

1. WRC charges NWAC to use the latest scientific information to evaluate North Carolina nongame species for changes in status. This charge initiates action from NWAC to form a Scientific Council and oversee its deliberations. This Council only serves to fulfill the current charge and its members receive no compensation.
2. Scientific Council Chairperson establishes and meets with Taxa Subcommittees and WRC staff to: (a) provide work scope and schedule to update the listing status of North Carolina endangered, threatened, and special concern species; (b) establish the format of species accounts and final report; and (c) provide other relevant materials to each Taxa Subcommittee, as necessary.

3. Taxa Subcommittees meet to discuss status listings of species and assign the preparation of species accounts as needed.
4. Taxa Subcommittees complete species accounts and submit draft reports to the Scientific Council Chairperson.
5. Scientific Council Chairperson and WRC staff distribute draft reports to the NWAC for review.
6. Draft reports with NWAC comments returned to Taxa Subcommittee Chairpersons for revision, as necessary.
7. Revised reports received by Scientific Council Chairperson.
8. Revised reports distributed to NWAC for review and approval; returned to Taxa Subcommittee Chairpersons for any final revisions, if necessary.
9. Final reports forwarded from NWAC to WRC Executive Director and staff. NWAC Chairperson and Scientific Council Chairperson meet with Executive Director and staff to review the species listing recommendations.
10. WRC Commission reviews report and approves, as appropriate, species listing recommendations.

The Scientific Council is composed of groups of taxa experts “that review the scientific evidence and evaluate the status of wildlife species for inclusion on a protected animal list” and report their findings to the NWAC. The most recent Scientific Council established six Taxa Subcommittees: Amphibians and Reptiles, Birds, Crustaceans, Freshwater Fishes, Mammals, and Freshwater and Terrestrial Mollusks.

Recommendations from the NWAC are submitted to WRC staff who review and incorporate its professional input on each recommendation before presentation to the agency’s 19-member governing board — the Wildlife Commissioners — for official action. The Wildlife Commissioners examine the relevant scientific and economic data and factual information before considering whether a species should be placed on a Protected Animal List. If approved by the Wildlife Commissioners, changes to a Protected Animal List must then go through the normal rule-making process (Administrative Procedures Act; APA) before being codified in the NCAC. The overall process to list a species can take four years or more, depending on the availability of data, the Scientific Council review and comment periods, and the required rules schedule.

G.S. 113 Article 25 provides latitude on the frequency of revising the state list. The only requirement is “to reconsider and revise the lists from time to time in response to public proposals or as the Commission deems necessary” (G.S. 113-333 (a) (2)). WRC may initiate a rule revision at any time, such as in response to a change in a federal listing or some emergency. Over the past several decades, WRC and the Scientific Council have generally assessed species status about every five years.

In addition to the process described above, as part of the APA ([G.S. 150B-20](#)) any person can petition the WRC to adopt a rule, including listing a species as protected. WRC has established a petition process specifying applicable procedures and deadlines as required by the APA.

Scientific Criteria to List a Species

G.S. 113 Article 25 provides significant direction as to the issues and criteria to be considered when determining if a species warrants listing. It dictates that the following factors be considered when determining listing status:

1. Whether any other state or federal agency or private entity is taking steps to protect the wild animal which is the subject of the proposal;
2. Whether there is present or threatened destruction, modification, or curtailment of its habitat;
3. If there is over utilization for commercial, recreational, scientific, or educational purposes;
4. Whether there is critical population depletion from disease, predation, or other mortality factors;
5. Whether alternative regulatory mechanisms exist; and
6. The existence of other man-made factors affecting continued viability of the animal in North Carolina.

However, there is little guidance on an evaluation method to assign a species to endangered, threatened, or special concern lists. The Scientific Councils have used expert biological input, including from WRC staff, to evaluate species status. NWAC has reduced subjectivity and improved transparency in the evaluation process by providing uniform guidance to Taxa Subcommittees and introducing an objective methodology to inform evaluations.

3. Comparison of North Carolina Regulations to Federal Regulations and Those of Other Regional States

Herein, we also compare the federal listing regulations and policies to those of several southeastern states (Appendix F). Although the main comparisons are to the federal process, North Carolina's positions and policies are highlighted. States included in this comparison are selected members of the Southeastern Association of Fish and Wildlife Agencies (SEAFWA): Alabama, Georgia, Florida, South Carolina, Tennessee and Virginia.

Federal Process

The USFWS administers the ESA, which officially classifies species as endangered or threatened on the Federal Endangered Species List (FESL). The USFWS also maintains a list of candidate species for evaluation. Species are proposed for candidacy through either professional biologist assessment or a formal petition process that is initiated by the public. The USFWS considers five factors when determining if a species warrants listing as threatened or endangered:

1. damage to, or destruction of, a species' habitat;
2. overutilization of the species for commercial, recreational, scientific, or educational purposes;
3. disease or predation;
4. inadequacy of existing protection; and
5. other natural or man-made factors that affect the continued existence of the species.

Notably, under the federal ESA, a species can be classified as endangered or threatened due to similarity of appearance with another federally listed species. These species are federally listed to facilitate regulation of international trade of other listed species. Species federally listed due to similarity of appearance are not biologically endangered or threatened and are not subject to the same protections as federally endangered and federally threatened species. For example, the USFWS lists the American alligator (*Alligator mississippiensis*) in North Carolina as federally threatened due to similarity of appearance with other listed crocodilian species.

The USFWS lists and delists species on the FESL through the federal rulemaking process. The status of each species is reviewed every five years after it has been listed to ensure that the list reflects the most current data. Candidate species are assessed annually. The USFWS also assigns listing priority numbers to each candidate species.

The USFWS's administration of the ESA has evolved in a changing legal environment to improve its evaluations of species status. The USFWS has implemented a new evaluation process, the Species Status Assessment (SSA), to inform its decision-making process for federal listing. The SSA supplements the five-factor analysis and evaluates species in terms of resiliency, redundancy, and representation. Resiliency is measured by the size and growth rate of a species. Redundancy is characterized by having multiple, resilient populations distributed across the range of the species. Representation is a measure of the genetic and ecological diversity of the species and indicates the ability of the species to adapt over time to long-term changes in the environment. In general, the more redundant, representative, and resilient a species is, the more likely it is to sustain populations over time under changing environmental conditions. An important feature of the SSA process is that expert input is solicited from informed scientists, including state wildlife agency staff. The SSA now in use by the USFWS requires range-wide information on a species to support a listing decision.

The USFWS uses information provided by many states to inform the federal listing process including state Natural Heritage Program databases, state Wildlife Action Plans, and State Endangered and Threatened Species Lists (SESL). As of January 2016, there are 78 species in North Carolina that are being evaluated by the USFWS for listing as federally endangered or federally threatened. North Carolina is prepared to provide the information that the USFWS needs to determine resiliency, redundancy, and representation for the SSA process. Species evaluations completed by the Scientific Council and the WRC staff to meet the requirements of G.S. 113 Article 25 will be shared with the USFWS in a format that is current, accurate, and useable in the federal SSA process.

The federal government is not required by the ESA to use economic factors when determining whether or not a species ought to be federally listed. However, the substantial economic impacts of some federal listing actions have demonstrated the need for consideration of these factors. A recent example of the federal government's incorporation of economic factors in a listing decision is the decision not to list the Sage Grouse (*Centrocercus urophasianus*) — a listing that would have had considerable economic impacts on the energy industry in western states. The federal government consulted with those states and the energy industry and, based upon conservation actions for Sage Grouse already in place or planned, decided that protection under the Federal ESA was not required. This decision by the USFWS was challenged in federal court, but upheld.

State Processes

All states in the comparison have a traditional SESL that structurally resembles the FESL except Florida, Tennessee, and Alabama. The traditional SESL format uses both the classifications endangered and threatened, like the FESL. Florida and Tennessee only use the endangered and threatened nomenclature for federally endangered and federally threatened species, respectively, and then have their own designations for state-protected species. Florida only has a “state-designated threatened” classification for its state list, although it recognizes the classifications of the FESL. Alabama recognizes the FESL and, in place of a traditional SESL, has a list of “protected species by regulation”. Although not all states have a traditional SESL, we refer to “state lists” even for those states with nontraditional ways of registering protected species.

As a clarification, all U.S. states developed a SESL using the federal ESA definitions as a baseline. Many states have adapted and modified their legislation and status classifications since this time. North Carolina’s listing designations are “endangered” and “threatened,” and in addition “special concern”. A North Carolina special concern species is any species of wild animal native or once native to North Carolina that is determined by the WRC to require monitoring but that may still be taken under regulations adopted under the provisions of G.S. 113 Article 25 and by rule.

In comparison with the federal government, North Carolina and each nearby state examined have their own processes for determining whether or not a species qualifies for state listing. All states rely upon expert biological input to evaluate available information and make informed recommendations to rulemaking boards or commissions. However, two additional sources of information for status evaluations are employed by some states.

The International Union for the Conservation of Nature (IUCN) protocol is recognized worldwide by many conservationists and governments as the standard by which to evaluate a species’ conservation status by using a precautionary approach. Classifications are: least concern, near threatened, vulnerable, endangered, critically endangered, extinct in the wild, and extinct. Six broad categories with multiple subcategories determine a species’ classification on the IUCN list. Numeric scores for factors such as population size, population decline, number of populations, and geographic range size determine the conservation status of a species. Only one criterion has to be met for a species to be considered for an at-risk category and the severity of the criterion determines the classification level. States using the IUCN criteria or a modified version include Florida and Tennessee. Tennessee uses a blend of both the IUCN and TNC systems.

TNC’s NatureServe system is similar to the IUCN system in that only one criterion must be met for a species to be classified. Both systems also take population trends and current or potential habitat degradation into consideration. TNC NatureServe criteria are parsed out into more specific categories than the more general IUCN system, with nine categories rather than six. However, the same basic life history, range, and threat information is analyzed. States using the TNC NatureServe protocols or a modified version include: Alabama, Georgia, Tennessee, and South Carolina.

Economic factors are explicitly needed for listing analyses in both Florida and North Carolina. G.S. 113 Article 25 stipulates economic factors should be considered when developing conservation plans and, if there is merit found in a listing proposal, the WRC must examine “relevant scientific and economic data” to determine if state listing is warranted. G.S. 113-332 also states that no part of state listing should limit the rights of landowners to manage their

property for agriculture, forestry, development, or any other lawful practice. The “Wildlife Resources Commission shall not adopt any rule that restricts the use or development of private property.” Florida’s examination of economic impacts is notably similar. Florida Administrative Code 68A-27.001 calls for economic impacts to be considered and evaluated in its definition of “management plan”. As part of a management plan, expected economic and social impacts must be accepted by the Florida Fish and Wildlife Conservation Commission.

North Carolina’s SESL is sometimes referenced in the application of rules and policies of federal and other North Carolina agencies. For example, G.S. 143-355.7(a) (4) directs water supply development to avoid or mitigate impacts to both federal and state endangered and threatened species. These rules and policies can restrict human activities to conserve the state’s native wildlife, just as hunting season restrictions conserve game populations. Proactive management to conserve species before declining to the point of federal listing decreases conservation costs and economic impacts to the state’s private sector.

The USFWS and state wildlife agencies are implementing policies to limit landowner liability that might result from actions that increase populations of listed and candidate species on privately owned lands. Federal-state-private partnerships as exemplified by Habitat Conservation Plans (HCP), like Safe Harbor HCPs for red-cockaded woodpecker (*Picoides borealis*), and Candidate Conservation Agreements (CCA), like the Sickletfin Redhorse CCA, conserve disappearing species in North Carolina while protecting private property rights of citizens. The WRC in collaboration with the USFWS is expanding the use of conservation agreements to sustain disappearing species and to gain and maintain the support of the state’s private sector.

In summary, every state we examined uses the expertise of staff and assembled taxa experts to make final recommendations for additions or deletions to its SESL. In every case, formal procedures by the state’s rulemaking body are required to list or delist a species on its SESL. As previously described, North Carolina uses an internal system based on expert biological input, extensive literature reviews, and an objective science-driven method to evaluate conservation status. Listing decisions are proposed and evaluated by many stakeholders in North Carolina. The Scientific Council, NWAC, agency staff, and the Wildlife Commissioners all work to make appropriate listing decisions.

4. Review of Policies by which North Carolina Addresses Introduced Species, including Impacts Associated with Hybridization

A review of the state policies addressing introduced species and hybridization requires some definition of terms.

1. Native Species –Wildlife species naturally occurring in North Carolina before the time of European exploration and settlement of North America (about 1500).
2. Reintroduced Native Species – Native wildlife species that disappeared from all or a segment of North Carolina and then were re-established through intentional releases of individuals.
3. Introduced Non-native Species – Free-roaming wildlife species that occur in North Carolina as a result of human activities, but that did not naturally occur before the time of European exploration and settlement of North America (about 1500).

4. Hybridization – A process of combining the genetic material of two animals of different races, breeds, varieties, species, or genera.

G.S. 113 Article 25 adopted by the General Assembly in 1987 compelled the WRC to intensify on-the-ground actions to conserve declining native species. As part of these conservation actions, WRC reintroduced two native species that were lost from all or portions of their former range in North Carolina. These reintroductions helped remove both species from the FESL, thereby reducing wildlife management costs to the state and also adverse economic impacts to landowners and businesses.

Past Introductions

Two species removed from the FESL due to WRC and USFWS conservation activities are the American bald eagle (*Haliaeetus leucocephalus*) and the peregrine falcon (*Falco peregrinus*). Both were extirpated from North Carolina by the effects of the pesticide DDT. Both were returned to the state by collaborative reintroduction projects between the USFWS and the WRC. Both used source populations for release that were of varied heritage and genetically distinct from North Carolina's native populations. This created opportunity for hybridization to occur among their founder populations.

Hybridization is a naturally occurring process that can result in species evolution, adaptation, or diversification. It occurs naturally in hybrid zones, narrow geographic regions where genetically distinct populations come into contact, mate and produce viable offspring. New hybrid zones can form as species distributions shift in response to environmental change. Additionally, reintroduction of native species can result in hybridization with existing, related wildlife in release areas.

The bald eagle is a reintroduced native bird species to North Carolina. Two subspecies of bald eagles are recognized. The southern subspecies (*H. l. leucocephalus*) is found from southern California through the Gulf States. The northern subspecies (*H. l. alascanus*) is found everywhere else, including North Carolina. The North Carolina population of eagles declined through the middle part of the 20th century due to take by landowners. An even sharper decline occurred in the 1960s and '70s due to the thinning of their egg shells as a result of pesticide (DDT) use. The USFWS listed the bald eagle as federally endangered in 1967. By the mid-1970s, the breeding population in North Carolina had been reduced to zero.

After DDT use was banned in the United States, the WRC began releasing young eagles from outside the state at a site on Lake Mattamuskeet National Wildlife Refuge. Nestlings were either taken directly from nests where populations were relatively high, or eggs were taken to the federal government's Patuxent Wildlife Research Center where they were hatched and then brought to North Carolina for release at Lake Mattamuskeet. A total of about 24 birds were reintroduced into the state using both *H. l. leucocephalus* and *H. l. alascanus* populations as sources of young. The restoration work was successful. Populations of bald eagle have increased from the 1980s through the present day. This expansion is not only due to reintroduction efforts, but also immigration from recovering populations in neighboring states. The WRC now monitors 140 nesting territories of bald eagles in North Carolina. The USFWS removed the American bald eagle from the FESL in 2008.

The peregrine falcon is a reintroduced native species that was lost as a breeding resident in the state. North Carolina's breeding population belonged to the subspecies *F. p. anatum*. The USFWS listed the peregrine falcon as federally endangered in 1970. The USFWS and WRC reintroduced captive-bred peregrine falcon young from various source populations, including *F. p. anatum*, *F. p. tundrius*, *F. p. peali*, and *F. p. brookei*. Our native subspecies, *F. p. anatum*, was not well-represented among the 92 young birds released in western North Carolina due to its poor representation in captive breeding programs. The Peregrine Falcon Recovery Team established by the USFWS decided after considerable debate to proceed with the reintroduction using captive-bred young from different subspecies. This decision was made with the expectation that natural selection of wild-born young of diverse genetic heritage would eventually result in a regionally adapted population. The WRC released 92 young peregrine falcons into suitable habitat in the mountains between 1984 and 1997. The peregrine falcon reintroduction project was successful. State wildlife biologists documented the first nesting attempt in 1987 and the first wild-produced young surviving to leave the nest in 1988, four years after the reintroduction attempt began. Today this avian predator breeds throughout North Carolina's mountains and has colonized larger cities in adjacent Piedmont habitats, with an average of 11 pairs each year making breeding attempts. The USFWS removed the peregrine falcon from the FESL in 1999.

One notable species restoration project in North Carolina has not been as successful as the American bald eagle and peregrine falcon restoration projects. The USFWS made a decision in 1986 to establish a red wolf (*Canis rufus*) population on the Alligator National Wildlife Refuge in Tyrrell and Dare counties. The USFWS released 132 red wolves on the Albemarle Peninsula (Beaufort, Dare, Hyde, Tyrell, and Washington counties) between 1987 and 2013. The red wolf population slowly grew and reached a peak reported population of 100-130 wolves in 2007. However, since 2007, the population has slowly declined for a variety of factors, including poor reproduction and adult wolf mortality.

Written historical records indicate wolves were a native species in North Carolina before European settlement. However, it is not certain whether the native wolf was more closely related to red wolf or to gray wolf (*Canis lupus*). Canid taxonomy is complex and there is not a good understanding of the genetic characteristics of North Carolina's native wolf. The debate is complicated by the lack of physical evidence from the original wolf population.

The red wolf was described in 1841 by John James Audubon and John Bachman, the gray wolf was described in 1758 by Carolus Linnaeus, and the coyote (*Canis Latrans*) was described in 1823 by Thomas Say, in each case using physical characteristics like skeletal and tooth features, size, and pelage. These three taxa continued to be considered distinct species until the early 1990s, when new techniques (e.g. DNA studies and multivariate statistics) discovered widespread hybridization among them.

There are three biological interpretations of data that describe red wolf, coyote, and gray wolf relationships.

1. The first interpretation, based on recent research on canids throughout North America, suggests that the eastern timber (or Algonquin) wolf (*Canis lupus lycaon*) and red wolf are very closely related and should be considered conspecific (members of the same species), and it suggests that their closest relative is the coyote. In this opinion, the gray wolf is a

distinct and more taxonomically distant species, widespread in Eurasia and more recently expanding its geographic distribution into northwestern North America.

2. The second interpretation, also based on genetic data, suggests that the red wolf is a hybrid between the gray wolf and coyote.
3. A third interpretation, based primarily on tooth size and morphology in Recent and Pleistocene *Canis*, suggests that the red wolf is the primitive “wolf” of North America and that it was in North America before the gray wolf moved into western North America from Eurasia.

Clearly, the jury is still out on which interpretation is correct and it may prove impossible to resolve these three hypothetical relationships. However, all of these biological interpretations have three areas of agreement.

1. The gray wolf originated in Eurasia and subsequently moved into North America via the Beringia Land Bridge.
2. The gray wolf and coyote represent distinct biological species.
3. There is widespread hybridization between and among contiguous populations of *Canis rufus*, *C. lupus lycaon*, *C. lupus*, and *C. latrans*. In other words, each taxonomic group hybridizes with all other taxonomic groups and the large home ranges of each taxonomic unit have resulted in complex combinations of genetic heritages.

The red wolves introduced on the Albemarle Peninsula are descendants of 14 individuals captured from 1974 to 1980 in southwestern Louisiana and southeastern Texas. The red wolves found on the Albemarle Peninsula today have ancestors that hybridized with coyotes and perhaps Algonquin wolves and gray wolves to varying extent in the past. Their relationship to North Carolina’s native wolf is not clearly known.

Until the 1980s, coyotes seen in North Carolina are thought to have resulted from illegal importation and release by individuals for sport hunting and other reasons. However by the 1980s, coyotes expanded their range into western North Carolina from Tennessee, Georgia and South Carolina. This natural expansion was aided by human-caused changes to the state’s natural communities during the 18th and 19th centuries, specifically land clearing for agriculture and extirpation of native wolf populations. Coyote populations steadily expanded after 1980 and the entire state was soon occupied.

Coyotes mating with red wolves have complicated efforts to establish and maintain a viable population of red wolves in North Carolina. Since 1999, the USFWS has captured, sterilized, and released some coyotes paired with wolves to reduce breeding between the two species. The efficacy of this strategy to reduce wolf and coyote hybridization is as yet unknown; however, this hands on labor-intensive management strategy is inconsistent with the red wolf recovery objective of a self-sustaining population.

While the WRC in 1986 did not actively support or oppose the red wolf restoration attempt, it did support the designation of a reestablished wolf population as an “experimental, non-essential population.” This legal designation provides WRC and the public with limited liability in situations where red wolves were killed.

The WRC recently requested that the USFWS end the restoration attempt of red wolves on the Albemarle Peninsula and declare in federal rules that the red wolf is extinct in the wild in North Carolina. The USFWS is now reviewing the red wolf restoration project to decide its future. Regardless of the fate of the program, the WRC is actively involved in a state, federal, and stakeholder collaborative effort to manage wild canids on the Albemarle Peninsula.

Recent and Pending Introductions

WRC is actively working with the USFWS to reverse the declining trends of other North Carolina native species. Reintroduction attempts by WRC demonstrate current conservation activities to recover three rare aquatic species, Cape Fear shiner (*Notropis mekistocholas*), Carolina heelsplitter (*Lasmigona decorata*), and sicklefin redhorse (*Moxostoma sp.*).

The Cape Fear shiner is a small minnow found only in the Cape Fear River basin in North Carolina. The species is found only in Randolph, Moore, Lee, Harnett, and Chatham counties. All populations are known from the main stem reaches of, and tributaries to, the Deep, Haw, and Cape Fear rivers. It is designated as federally endangered by the USFWS. Threats to this species are water pollution and dams. The population of Cape Fear shiner in the Rocky River upstream of Woody Mill Dam in Chatham County is severely depressed due to past land-use and water-quality issues that have since been corrected. However, natural migration of Cape Fear shiner back into this reach of the Rocky River was blocked by the presence of the dam. In 2012, USFWS requested WRC assistance in restoring the Cape Fear shiner into the Rocky River above Woody Mill Dam. Because this part of the Rocky River was already officially designated as critical habitat by the USFWS, the WRC determined that restoring the Cape Fear shiner in the Rocky River was unlikely to lead to any additional regulatory burden on any local government, business, or private landowner. After conducting several outreach and information-gathering events with the public, Chatham County, and Siler City, the USFWS and WRC began stocking Cape Fear shiner into the restoration area in 2013. Subsequent surveys have found that the Cape Fear shiner is now persisting and reproducing in the restoration area. It is hoped that these and other conservation actions that support Cape Fear shiner will eventually lead to the down listing or delisting of this species.

The Carolina heelsplitter is a mussel found in North Carolina and South Carolina. In North Carolina, it is known only from two streams in the Pee Dee River basin in Union County and two streams in the Catawba River basin in Union and Mecklenburg counties. This species is designated as endangered by the USFWS. To prevent the extirpation of the species from North Carolina, WRC took Carolina heelsplitter from both the Catawba and Pee Dee River basins to propagate them at the Conservation Aquaculture Center (CAC) — a WRC hatchery for mussels and nongame fish. At the CAC, the mussels were bred and hundreds of offspring were produced. Because the populations from the Catawba River basin are considered genetically distinct from those of the Pee Dee River basin, WRC staff at the CAC implemented protocols to avoid hybridizing the two populations. In conjunction with the USFWS, the WRC stocked more than 600 Carolina heelsplitters into Goose and Duck Creeks in Union County in 2014, and another 135 were stocked in Waxhaw Creek in Union County in 2015. These mussels were stocked after staff determined that doing so would likely not lead to increased regulatory burden on any local government, business, or private landowner because the mussels were still extant in these streams and both areas were already designated as critical habitat by the USFWS.

The sicklefin redhorse is a large member of the sucker family found primarily in the Little Tennessee River and Hiwassee River basins in Cherokee, Clay, Swain, Macon, and Jackson counties. This species is currently being evaluated by the USFWS to determine if it warrants listing as federally endangered or federally threatened. As part of ongoing conservation efforts, the WRC has been augmenting the population of sicklefin redhorse by stocking the fish in the Tuckasegee and Oconaluftee rivers. These stockings have been carried out in conjunction with several partners including the USFWS and Eastern Band of the Cherokee Indian (EBCI) Tribe. These stockings have occurred in areas where the species is currently found and should not result in any increased regulatory burden to any entity should the USFWS add this species to the FESL.

Recently the WRC, GA Department of Natural Resources (GA DNR), USFWS, EBCI, Duke Energy, and the Tennessee Valley Authority signed an agreement to undertake conservation activities jointly for the sicklefin redhorse. This agreement — a Candidate Conservation Agreement (CCA) — guarantees that conservation actions will be carried out for the protection of this species. CCA partners believe the actions outlined in the CCA should preclude the need for the USFWS to list the sicklefin redhorse as federally threatened or federally endangered. Should the USFWS determine the sicklefin redhorse does not warrant listing, then the WRC will consider stocking the sicklefin redhorse into parts of its historic range that are currently unoccupied. The Sicklefin Redhorse CCA is an excellent example of how state and federal governments, along with private businesses, can cooperate to conserve fish and wildlife resources.

When evaluating proposals to introduce or reintroduce wildlife species, it is important to remember lessons learned in other introduction attempts. The introduction projects discussed in this report demonstrate several important characteristics.

1. Wildlife introductions can have positive and negative consequences on human society and North Carolina's natural communities.
2. Successful reintroductions of native species have been conducted by the state in accordance with G.S. 113 Article 25 using captive-bred individuals of closely related, but not identical, source populations.
3. Hybridization of introduced species with native or naturalized species has occurred in North Carolina in several instances and the results have varied in their extent and effect depending on the species involved.
4. Introductions of wildlife species to the state are sometimes intentional, but may also happen accidentally due to a variety of human activities.
5. Past introductions of wildlife species in North Carolina have not always been carried out by the state nor have they always been of native species. For example, an introduction that occurred before establishment of the WRC was of Central European (Russian) boar (*Sus scrofa scrofa*). Another introduction that occurred after establishment of WRC was of elk (*Cervus canadensis nelsoni*). Russian boar is an example of a non-native species introduced by a private business concern. Elk is an example of a native species reintroduced by the National Park Service.

5. Recommendations for Improving Policies Related to Introduced Species including Impacts Associated with Hybridization

North Carolina does not have a single written policy governing wildlife introductions. Instead, the state develops policy in response to specific introduction proposals or events. These policies address complex biological, socio-economic, and political factors that vary substantially and require consideration on a case-by-case basis to ensure the best conservation decisions are made.

While there is no single written policy regarding introduction of wildlife species, there are several laws that control the introduction of wildlife species. For example, G.S. 113-292 (d) confers authority to the WRC to regulate “release into public or private waters or the environment of zoological or botanical species or specimens that may threaten the introduction of epizootic disease or may create a danger to or an imbalance in the environment inimical to the conservation of wildlife resources.”

Policy Recommendations

Current WRC policy requires staff to request approval of its 19-member governing board — the Wildlife Commissioners — whenever introductions of listed or candidate species are made to new locations within the state, even when the species already exists within the state (Appendix H). The Wildlife Commissioners adopted in August 2000 a “Policy to Guide the Release of Rare Aquatic Species” to guide planned population augmentation and introductions.

This review of policies to address introduced species including impacts associated with hybridization suggests several improvements to best conserve the state’s disappearing wildlife species.

1. Staff should review, revise, and submit to the Wildlife Commissioners for approval a modification to the “Policy to Guide the Release of Rare Aquatic Species” that broadens its scope to include terrestrial species and other topics, including hybridization with native and naturalized wildlife. Significant changes to the state’s socio-economic, political, and biological environments have occurred since the original policy was adopted in August 2000.
2. North Carolina should expand its collaboration with the wildlife agencies of other states to ensure that effective “on-the-ground” actions, including population augmentation and species reintroductions, conserve species before federal protection under ESA is required.
3. The WRC should meet its obligations as described in the North Carolina Aquatic Nuisance Species Management Plan (ANS Plan). The plan seeks “to improve the state’s ability to address aquatic invasive and aquatic nuisance species with the goal of preventing and controlling their introduction, spread, and negative impacts.”

Appendix A – North Carolina General Statute Concerning Endangered Species

Article 25. Endangered and Threatened Wildlife and Wildlife Species of Special Concern.

§ 113-331. Definitions.

All of the definitions contained in Article 12 of this Chapter 113 shall apply in this Article except to the extent that they may be herein modified for the purposes of this Article 25. As used in this Article, unless the context requires otherwise:

- (1) "Conserve" and "conservation" mean the use and application of all methods, procedures and biological information for the purpose of bringing populations of native and once native- species of wildlife in balance with the optimum carrying capacity of their habitat, and maintaining such balance. These methods and procedures include all activities associated with scientific resource management such as research; census; law enforcement; habitat protection, acquisition, and enhancement; and restoration of species to unoccupied parts of historic range. With respect to endangered and threatened species, the terms mean the use of methods and procedures to bring the species to the point at which the measures provided are no longer necessary.
- (2) "Endangered species" means any native or once native- species of wild animal whose continued existence as a viable component of the State's fauna is determined by the Wildlife Resources Commission to be in jeopardy or any species of wild animal determined to be an "endangered species" pursuant to the Endangered Species Act.
- (3) "Endangered Species Act" means the Endangered Species Act of 1973, Public Law 93-205 (87 Stat. 884), as it may be subsequently amended.
- (4) "Advisory Committee" means the North Carolina Nongame Wildlife Advisory Committee which is the advisory body of knowledgeable and representative citizens established by resolution of the Wildlife Resources Commission and charged to consider matters relating to nongame wildlife conservation and to advise the Commission in such matters.
- (5) "Protected animal" means a species of wild animal designated by the Wildlife Resources Commission as endangered, threatened, or of special concern.
- (6) "Protected animal list" means any one of the lists of North Carolina animal species that are endangered, threatened, or of special concern.
- (7) "Scientific council" means the group of scientists identified and assembled by the Advisory Committee to review the scientific evidence and to evaluate the status of wildlife species that are candidates for inclusion on a protected animal list.
- (8) "Special concern species" means any species of wild animal native or once native- to North Carolina which is determined by the Wildlife Resources Commission to require monitoring but which may be taken under regulations adopted under the provisions of this Article.
- (9) "Threatened species" means any native or once native- species of wild animal which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range, or one that is designated as a threatened species pursuant to the Endangered Species Act.
- (10) "Wild animal" means any native or once native- nongame amphibian, bird, crustacean, fish, mammal, mollusk or reptile not otherwise legally classified by statute or regulation such as game and fur bearing animals, except those inhabiting and depending upon coastal fishing waters, marine and estuarine resources, marine mammals found in coastal fishing waters, sea turtles found in coastal fishing waters, and those declared to be pests under the Structural Pest Control Act of North Carolina of 1955 or the North Carolina Pesticide Law of 1971. Nothing in this definition is intended to abrogate G.S. 113-132(a) or (c), confer jurisdiction upon the Wildlife Resources Commission as to any subject exclusively regulated by any other agency, or to authorize the Wildlife Resources Commission by its regulations to supersede any valid provision of law or regulation administered by any other agency. (1987, c. 382, s. 1.)

§ 113-332. Declaration of policy.

The General Assembly finds that the recreation and aesthetic needs of the people, the interests of science, the quality of the environment, and the best interests of the State require that endangered and threatened species of wild animals and wild animals of special concern be protected and conserved, that their numbers should be enhanced and that conservation techniques be developed for them; however, nothing in this Article shall be construed to limit the

rights of a landholder in the management of his lands for agriculture, forestry, development or any other lawful purpose without his consent. The North Carolina Zoological Park is not subject to the provisions of this Article. (1987, c. 382, s. 1.)

§ 113-333. Powers and duties of the Commission.

(a) In the administration of this Article, the Wildlife Resources Commission shall have the following powers and duties:

- (1) To adopt and publish an endangered species list, a threatened species list, and a list of species of special concern, as provided for in G.S. 113-334, identifying each entry by its scientific and common name.
- (2) To reconsider and revise the lists from time to time in response to public proposals or as the Commission deems necessary.
- (3) To coordinate development and implementation of conservation programs and plans for endangered and threatened species of wild animals and for species of special concern.
- (4) To adopt and implement conservation programs for endangered, threatened, and special concern species and to limit, regulate, or prevent the taking, collection, or sale of protected animals.
- (5) To conduct investigations to determine whether a wild animal should be on a protected animal list and to determine the requirements for conservation of protected wild animal species.
- (6) To adopt and implement rules to limit, regulate, or prohibit the taking, possession, collection, transportation, purchase or sale of those species of wild animals in the classes Amphibia and Reptilia that do not meet the criteria for listing pursuant to G.S. 113-334 if the Commission determines that the species requires conservation measures in order to prevent the addition of the species to the protected animal lists pursuant to G.S. 113-334. This subdivision does not authorize the Commission to prohibit the taking of any species of the classes Amphibia and Reptilia- solely to protect persons, property, or habitat; to prohibit possession by any person of four or fewer individual reptiles; or to prohibit possession by any person of 24 or fewer individual amphibians.

(b) Using the procedures set out in Article 2A of Chapter 150B of the General Statutes, the Wildlife Resources Commission shall develop a conservation plan for the recovery of protected wild animal species. In developing a conservation plan for a protected wild animal species, the Wildlife Resources Commission shall consider the range of conservation, protection, and management measures that may be applied to benefit the species and its habitat. The conservation plan shall include a comprehensive analysis of all factors that have been identified as causing the decline of the protected wild animal species and all measures that could be taken to restore the species. The analysis shall consider the costs of measures to protect and restore the species and the impact of those measures on the local economy, units of local government, and the use and development of private property. The analysis shall consider reasonably available options for minimizing the costs and adverse economic impacts of measures to protect and restore the species.

(c) In implementing a conservation plan under this Article, the Wildlife Resources Commission shall not adopt any rule that restricts the use or development of private property. If a conservation plan identifies a conservation, protection, or restoration measure the implementation of which is beyond the scope of the authority of the Wildlife Resources Commission, the Commission may petition the General Assembly, any agency that has regulatory authority to implement the measure, a unit of local government, or any other public or private entity and request the assistance of that agency or entity in implementing the measure.

(d) The Commission is authorized to develop a bat eviction and exclusion curriculum that may be taught by trade associations or wildlife conservation organizations for certification. The curriculum may incorporate the training that is provided as part of Wildlife Damage Control Agent certification in best management practices for removing and evicting bats from structures and in preventing bats from reentering structures. (1987, c. 382, s. 1; 1995, c. 392, s. 1; 2003-100, s. 1; 2009-219, s. 1.)

§ 113-334. Criteria and procedures for placing animals on protected animal lists.

(a) All native or resident wild animals which are on the federal lists of endangered or threatened species pursuant to the Endangered Species Act have the same status on the North Carolina protected animals lists.

(b) The Advisory Committee, after considering a report on the status of a candidate species from the Scientific Council, may by resolution propose to the Wildlife Resources Commission that a species of wild animal be added to or removed from a protected animal list.

(c) If the Commission, with the advice of the Advisory Committee, finds there is probably merit in the proposal, it shall examine relevant scientific and economic data and factual information necessary to determine:

- (1) Whether any other state or federal agency or private entity is taking steps to protect the wild animal which is the subject of the proposal;
- (2) Whether there is present or threatened destruction, modification, or curtailment of its habitat;
- (3) If there is over-utilization for commercial, recreational, scientific, or educational purposes;
- (4) Whether there is critical population depletion from disease, predation, or other mortality factors;
- (5) Whether alternative regulatory mechanisms exist; and
- (6) The existence of other man-made factors affecting continued viability of the animal in North Carolina.

(d) The Commission, with the advice of the Advisory Committee, shall tentatively determine whether any regulatory action is warranted with regard to the proposal and, if so, the specific regulatory action to be proposed by it. Notice of its proposed rulemaking shall be published in the North Carolina Register and the subsequent proceedings shall conform with the Administrative Procedure Act. (1987, c. 382, s. 1.)

§ 113-335. North Carolina Nongame Wildlife Advisory Committee.

The North Carolina Nongame Wildlife Advisory Committee is created subject to constitution, organization, and function as determined appropriate and advisable by resolution of the Wildlife Resources Commission. The Advisory Committee is to be comprised of knowledgeable and representative citizens of North Carolina whose responsibility shall be to advise the Commission on matters related to conservation of nongame wildlife including creation of protected animal lists and development of conservation programs for endangered, threatened, and special concern species.

Members of the Advisory Committee shall receive necessary travel and subsistence expenses while on official business of the Committee in accordance with G.S. 1385 and G.S. 1386, to be paid from the Nongame Account of the Wildlife Resources Fund. (1987, c. 382; 1989 (Reg. Sess., 1990), c. 1066, s. 48.)

§ 113-336. Powers and duties of the Advisory Committee.

The Advisory Committee shall have the following powers and duties:

- (1) To gather and provide information and data and advise the Wildlife Resources Commission with respect to all aspects of the biology and ecology of endangered, threatened, and special concern species;
- (2) To investigate and make recommendations to the Commission as to the status of endangered, threatened, and special concern species;
- (3) To identify and assemble experts from the disciplines of ornithology, mammalogy, herpetology, ichthyology, taxonomy, ecology and other fields as necessary to serve as the Scientific Council and to charge the Scientific Council to review the scientific evidence, to evaluate the status of candidate species, and to report back their findings with recommendations;
- (4) To develop and present to the Commission management and conservation practices for preserving endangered, threatened, and special concern species;
- (5) To recommend critical habitat areas for protection or acquisition;
- (6) To advise the Commission on matters submitted to it by the Commission which involve technical zoological questions or the development of pertinent regulations, and to make any recommendations as deemed by the Advisory Committee to be worthy of the Commission's attention. (1987, c. 382, s. 1.)

§ 113-337. Unlawful acts; penalties.

(a) It is unlawful:

- (1) To take, possess, transport, sell, barter, trade, exchange, export, or offer for sale, barter, trade, exchange or export, or give away for any purpose including advertising or other promotional purpose any animal on a protected wild animal list, except as authorized according to the regulations of the Commission, including those promulgated pursuant to G.S. 113-333(1);
- (2) To perform any act specifically prohibited by the regulations of the Commission promulgated pursuant to its authority under G.S. 113-333.

(b) Each person convicted of violating the provisions of this Article is guilty of a Class 1 misdemeanor. (1987, c. 382, s. 1; 1999-408, s. 10.)

§§ 113-338 through 113-350: Reserved for future codification purposes.

Appendix B – Cooperative Agreement between USFWS and NCWRC

COOPERATIVE AGREEMENT BETWEEN THE UNITED STATES FISH AND WILDLIFE SERVICE AND THE NORTH CAROLINA WILDLIFE RESOURCES COMMISSION

Effective Date: January 12, 1977

This Cooperative Agreement is entered into pursuant to section 6(c), 16 U.S.C. § 1535(c) (Supp. IV 1974), of the Endangered Species Act of 1973, 16 U.S.C. §§ 1531-43 (Supp. IV 1974) (hereinafter referred to as "the Act"), and Sections 113-84, 113-224, 113-305 and 143-251 of the General Statutes of North Carolina, between the United States Fish and Wildlife Service, U. S. Department of the Interior, and the North Carolina Wildlife Resources Commission. Hereinafter, the parties shall be referred to as "USFWS" and "Commission," respectively.

WHEREAS, the Congress of the United States has found that there are resident species of fish or wildlife which are in danger of extinction and that these species of fish or wildlife are of aesthetic, ecological, educational, scientific, economic, and other value to the Nation and its people;

WHEREAS, the purposes of the Act are to provide a means whereby the ecosystems upon which endangered or threatened fish or wildlife depend may be conserved, to provide a program for the conservation of such species, and to take such steps as may be appropriate to achieve the purposes of the various treaties and conventions related to the conservation of fish or wildlife; related to the conservation of fish or wildlife;

WHEREAS, the Congress of the United States has declared that encouraging the States and other interested parties, through Federal financial assistance and a system of incentives, to develop and maintain conservation programs which meet national and international standards is a key to meeting the Nation's international commitments and to better safeguarding, for the benefit of all citizens, the Nation's heritage in its fish and wildlife;

WHEREAS, the Secretary of the Interior has delegated his responsibilities under the Act to the Director, USFWS;

WHEREAS, the Director, USFWS, desires to enter into this Cooperative Agreement for the purpose of assisting in the implementation of the endangered or threatened fish or wildlife conservation program of the State of North Carolina for those species under his jurisdiction pursuant to Reorganization Plan Numbered 4 of 1970;

WHEREAS, the State of North Carolina, acting through the Commission, wishes to administer its program for the conservation of endangered or threatened fish or wildlife in harmony with the terms and spirit of the Act;

WHEREAS, the parties agree that programs of the State of North Carolina are designed to assist resident endangered or threatened fish or wildlife and that it is the mutual desire of the

Commission and the USFWS to work in harmony for the common purposes of planning, developing and conducting programs to protect, manage and enhance populations of all resident endangered or threatened fish or wildlife within the State;

WHEREAS, the Director, USFWS, has the statutory and administrative responsibility to establish programs for the conservation of endangered or threatened fish or wildlife which are under his jurisdiction pursuant to Reorganization Plan Numbered 4 of 1970; to provide periodic review of the State program at no greater than annual intervals; to provide funding to that program as such funding is available and in accordance with the terms of the Act; to provide coordination among the programs of the various states; and to exchange with the Commission such biological data or other information as may result in the enhancement of the opportunities for the continued survival of endangered or threatened fish or wildlife;

WHEREAS, the Commission has accepted the responsibility to conserve endangered or threatened fish or wildlife which are resident in the State of North Carolina, as defined at 50 CFR Part 81 (40 F. R. 47509, Oct. 9, 1975);

WHEREAS, the Commission (a) has the authority to conserve resident fish or wildlife determined by the Commission or the Secretary to be endangered or threatened; (b) has established and acceptable conservation program, consistent with the purposes and policies of the Act, for all resident fish or wildlife in the State which are deemed by the Secretary to be endangered or threatened and has furnished a copy of such a program together with all pertinent details, information, and data requested by the Secretary; (c) has the authority to conduct investigations to determine the status and requirements for survival of resident fish or wildlife; (d) has the authority to establish programs, including the acquisition of land or aquatic habitat or interests therein, for the conservation of resident endangered or threatened fish or wildlife; and (e) has provided for public participation in designating resident fish or wildlife as endangered or threatened.

Now therefore the parties agree as follows:

1. Cooperative Program

- (a) The Commission will carry out the activities identified in the program, as funding will allow, for the benefit of the endangered or threatened fish or wildlife which are resident in the State of North Carolina.
- (b) The Director, USFWS, may agree with the Commission to provide financial assistance for the implementation of an acceptable project for the conservation of endangered or threatened fish or wildlife. Such financial assistance will require the submission of an Application for Federal Assistance and the successful negotiation of a Project Agreement. These will comply with the Secretary's Rules and Regulations, 50 CFR Part 81 (40 F. R. 47509, Oct. 9, 1975), and the USFWS Federal Aid Manual.
- (c) As a part of this cooperative program, law enforcement authorities of USFWS and the State of North Carolina shall cooperate in the detection, apprehension, and prosecution of violators of the Act or State law intended to conserve endangered or threatened fish or wildlife.

- (d) In the event additional species of resident fish or wildlife in the State of North Carolina are listed as endangered or threatened by the State or USFWS, the parties agree to cooperate in the development of programs and projects for the benefit of such species.
- (e) It is understood that any Federal funding pursuant to section 6(d) of the Act is contingent on the continued implementation of an adequate and active program for the conservation of Federally-listed endangered or threatened fish or wildlife which are resident in the State of North Carolina, as defined at 50 CFR Part 81 (40 F. R. 47509, Oct. 9, 1975). If the program for the conservation of such fish or wildlife is determined by the Director, USFWS, to be inadequate or inactive, this Agreement and funding shall be terminated in accordance with section 5 or 7 of this Agreement.
- (f) As part of the consultation process, provided for by Sec. 7 of the Act, for the determination of critical habitat for Federally-listed endangered or threatened fish or wildlife, the parties agree to exchange biological and other data as necessary to facilitate such determination by the Director, USFWS.

2. Permits

(a) General Rule

The Commission agrees not to engage in, or issue a permit authorizing, the taking of resident Federally-listed endangered or threatened fish or wildlife as defined at 50 CFR Part 81 (40 F. R. 47509, Oct. 9, 1975), without prior issuance of a permit to the applicant by the Director, USFWS, except as authorized in subsection 2(b), (c), or (d) of this Agreement, or pursuant to a special rule in 50 CFR §§ 17.40-48.

(b) Endangered Species

Any qualified employee or agent of the Commission who is designated by the Commission for such purposes, may, when acting in the course of his official duties, take any resident Federally-listed endangered fish or wildlife for conservation purposes that are consistent with this Cooperative Agreement or any Project Agreement attached thereto, provided that such taking is not reasonably anticipated to result in:

- (1) the death or permanent disabling of the specimen;
- (2) the removal of the specimen from the State of North Carolina;
- (3) the introduction of the specimen or any of its progeny into an area beyond the historical range of the species; or
- (4) the holding of the specimen in captivity for a period of more than 45 consecutive days.

(c) Threatened Species

Any employee or agent of the Commission who is designated by the Commission for such purposes may, when acting in the course of his official duties, take any resident Federally-listed threatened fish or wildlife for the conservation purposes that are consistent with the purposes of the Act, or this Cooperative Agreement or any Project Agreement attached thereto; provided, however, that the authority conveyed to the Commission by this subsection may, at any time, be temporarily suspended for a particular project or conservation program by written notification from the Regional Director, USFWS, upon his receipt of substantial evidence demonstrating the use of this authority for the purposes inconsistent with the purposes of the Act. Upon notification of the temporary suspension and the reasons therefor, the Commission may request from the Director, USFWS, an opportunity to demonstrate compliance with the purposes of the Act. The Director shall promptly consider the evidence so submitted by the Commission and either reaffirm the conclusion of the Regional Director, USFWS, and revoke the authority temporarily suspended pursuant to this subsection, or reverse the conclusion of the Regional Director, USFWS, and reinstate the authority temporarily suspended.

(d) Emergency Provisions

Any employee or agent of the Commission who is designated by the Commission for such purposes may, when acting in the course of his official duties, take Federally-listed endangered or threatened fish or wildlife without a permit if such action is necessary to:

- (1) aid a sick, injured or orphaned specimen; or
- (2) dispose of a dead specimen; or
- (3) salvage a dead specimen which may be useful for scientific study; or
- (4) remove specimens which constitute a demonstrable but nonimmediate threat to human safety, provided that the taking is done in a humane manner; the taking may involve killing or injuring only if it has not been reasonably possible to eliminate such threat by live capturing and releasing the specimen unharmed in a remote area; or
- (5) defend his own life or the lives of others.

Any taking pursuant to this subsection 2(d) must be reported in writing within 5 days to the Regional Director, USFWS, for transmission to the Division of Law Enforcement, USFWS, in Washington, D.C. The specimen may only be retained, disposed of, or salvaged in accordance with the directions from the USFWS.

3. Records

The Commission agrees to maintain records of (1) the Federally-funded projects for the conservation of endangered or threatened fish or wildlife in accordance with Chapters 4 and 5 of the USFWS Federal Aid Manual; and (2) the number of specimens of each species of Federally-listed endangered or threatened fish or wildlife taken by Commission employees or agents pursuant to 50 CFR § 17.21(c)(5) or § 17.31(b) as

amended, the conservation purposes for which they were taken, and any mortalities or permanently disabling injuries resulting from the taking.

4. Notification

The Commission agrees to inform the USFWS of any change in circumstances which could cause the program to be out of conformance with the requirements of section 6(c) of the Act. Included without limitation are changes in the Commission's relevant constitutional, statutory, or regulatory authority. The Commission shall promptly furnish to the USFWS an assessment of the effect of such a change on the State's ability to remain in compliance with the requirements of section 6(c) of the Act. The Director, USFWS, agrees to notify the State of all regulations and rule makings, in accordance with section 4 of the Act, which might affect the adequacy and activeness of the State's program.

5. Effective Date and Renewal

- (a) This Agreement shall become effective when signed by the Director, USFWS, and the Executive Director of the Commission and may be renewed in the following manner: Not later than June 30 of each year the Commission shall submit to the USFWS the following items: (1) additions and deletions to the list of Federal and State-listed endangered or threatened fish or wildlife which are resident in the State; (2) a memorandum of law analyzing any changes in the Commission's statutory authority for endangered or threatened fish or wildlife which were made since the date of the previous program submission and also analyzing the application of State law to any resident fish or wildlife which have been added to the Federal endangered and threatened species list since the state of the previous program submission; (3) a list of any substantial changes in the endangered and threatened fish or wildlife conservation programs since the date of the previous program submission; (4) a detailed description of the number of specimens of each species of Federally-listed endangered or threatened fish or wildlife taken by Commission employees or agents pursuant to 50 CFR §§ 17.21(c) or 17.31(b) as amended, the conservation purposes for which they were taken, and any mortalities or permanently disabling injuries resulting from the taking; and (5) copies of such reports as the Commission has prepared since the previous program submission which discussed their conservation program accomplishment for resident Federally-listed endangered or threatened fish or wildlife.
- (b) USFWS will, on or before October 1 of each year, notify the Commission in writing either that the Cooperative Agreement is renewed effective October 1 of that year, or that the Commission's endangered or threatened fish or wildlife conservation program or authorities are not in compliance with the criteria of section 6(c) of the Act, and unless appropriate changes are made by June 30 of the following year, this Agreement shall be terminated.
- (c) For the purposes of this section, the phrase "previous program submission" means either the program submission of (1) the original Cooperative Agreement or (2) the

most recent renewal application for the Cooperative Agreement, whichever is later in time.

6. Amendment

This Agreement may be amended at any time with the concurrence of the signatory parties.

7. Termination

This Agreement may be terminated: (a) by mutual agreement; (b) by the Commission upon 60 days written notice to the USFWS; or (c) notwithstanding the renewal provisions in section 5(b) of this Cooperative Agreement, by the USFWS upon 60 days written notice to the Director of the Commission from the Regional Director, USFWS, stating that the State's endangered or threatened fish or wildlife conservation program is no longer in compliance with the criteria of section 6(c) of the Act or that the State has violated a provision of this Agreement. The Commission may submit a written request for review to the Director, USFWS, within 30 days of receipt of the termination notice. The Director, USFWS, will consider all evidence submitted by the Commission in its request for review and either reaffirm the conclusion of the Regional Director and terminate this Agreement at the end of the 60-day notification period, or reverse the conclusion of the Regional Director and revoke the notice of termination. All Federal funds which have been obligated to, but not expended by the Commission as of the date of the termination notice shall be retained by the USFWS for reallocation pursuant to section 6(d) of the Act unless: (1) those funds are specifically approved by the Regional Director for expenditure before the date of actual termination; or (2) the notice of termination is revoked by the Director, USFWS.

NORTH CAROLINA WILDLIFE RESOURCES
COMMISSION

By Robert B. Hazel
Executive Director

UNITED STATES FISH AND WILDLIFE SERVICE

By Lynn A. Greenwalt
Director

NORTH CAROLINA WILDLIFE RESOURCES COMMISSION

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JAN 13 1977

Appendix C – N.C. Administrative Code Regarding Endangered Species

SUBCHAPTER 10I - ENDANGERED AND THREATENED SPECIES

SECTION .0100 - ENDANGERED AND THREATENED SPECIES

15A NCAC 10I .0101 DEFINITIONS AND PROCEDURES

History Note: Authority G.S. 113-132; 113-134; 113-331; 113-333; 113-334; 113-336; 143-239; Eff. June 11, 1977; Amended Eff. August 1, 1988; RRC Objection due to lack of statutory authority Eff. August 18, 1994; Amended Eff. October 1, 1994; Repealed Eff. April 1, 1997.

15A NCAC 10I .0102 PROTECTION OF ENDANGERED/THREATENED/SPECIAL CONCERN

(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, there is no open season for taking any of the species listed as special concern in Rule .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 may issue permits to take or possess an 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, 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;
- (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 specimens, and abides by the caging requirements for the species set forth in 15A NCAC 10H .0302;
- (3) to a person who lawfully possessed any such species for more than 90 days immediately prior to the date that such species was listed and who abides by the caging requirements for the species set forth in 15A NCAC 10H .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*).

(c) Taking Without a Permit:

- (1) An individual may take an endangered, threatened, or special concern species in defense of his own life or the lives of others.
- (2) A state or federal conservation officer or employee who is designated by his agency to do so may, when acting in the course of his official duties, take, possess, and transport 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, 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 the specimen unharmed, in a habitat that is suitable for the survival of that species.

(d) Reporting. Any taking or possession of an endangered, threatened, or special concern species under Paragraphs (b) and (c) of this Rule is subject to applicable reporting requirements of federal law and regulations, and the reporting requirements of the permit issued by the Executive Director or 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 C.F.R. 21.30 when marked as required under those regulations. 50 C.F.R. 21.30 is hereby incorporated by reference, shall include any later amendments and editions of the incorporated material, and may be accessed free of cost at http://www.ecfr.gov/cgi-bin/text-idx?SID=1bc046c08a9f0f17cb904604d98ab748&node=se50.9.21_130&rgn=div8.
 - (4) Red Wolves (*Canis rufus*) listed as threatened in Rule .0104 in this Section may be taken or harassed pursuant to the conditions provided in 50 C.F.R. 17.84(c). 50 C.F.R. 17.84(c) is hereby incorporated by reference, shall include any later amendments and editions of the incorporated material, and may be accessed free of cost at <http://www.ecfr.gov/cgi-bin/text-idx?rgn=div8&node=50:2.0.1.1.1.8.1.5>.
 - (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.

15A NCAC 10I .0103 ENDANGERED SPECIES LISTED

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

- (1) Amphibians:
None Listed At This Time.
- (2) Birds:
 - (A) Bachman's warbler (*Vermivora bachmanii*);
 - (B) Ivorybilled woodpecker (*Campephilus principalis*-);
 - (C) Kirtland's warbler (*Dendroica kirtlandii*);

- (D) Piping plover (*Charadrius melodus circumcinctus*);
- (E) Redcockaded woodpecker (*Picoides borealis*);
- (F) Roseate tern (*Sterna dougallii dougallii*);
- (G) Wood stork (*Mycteria americana*).
- (3) Crustacea: None Listed At This Time.
- (4) Fish:
 - (A) Cape Fear shiner (*Notropis mekistocholas*);
 - (B) Roanoke logperch (*Percina rex*);
 - (C) Shortnose sturgeon (*Acipenser brevirostrum*), when found in inland fishing waters.
- (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;
 - (F) Virginia bigeared bat (*Corynorhinus townsendii virginianus*).
- (6) Mollusks:
 - (A) Appalachian elktoe (*Alasmodonta raveneliana*);
 - (B) Carolina heelsplitter (*Lasmigona decorata*);
 - (C) Dwarf wedge mussel (*Alasmodonta heterodon*);
 - (D) James spinymussel (*Pleurobema collina*);
 - (E) Littlewing pearlymussel (*Pegias fabula*);
 - (F) Tan riffleshell (*Epioblasma florentina walkeri*);
 - (G) Tar River spinymussel (*Elliptio steinstansana*).
- (7) Reptiles:
 - (A) Kemp's ridley seaturtle (*Lepidochelys kempii*);
 - (B) Atlantic hawksbill seaturtle (*Eretmochelys imbricata imbricata*);
 - (C) Leatherback seaturtle (*Dermochelys coriacea*).
- (b) The following species of resident wildlife are designated as statelisted endangered species:
 - (1) Amphibians: Green salamander (*Aneides aeneus*).
 - (2) Birds:
 - (A) American peregrine falcon (*Falco peregrinus anatum*);
 - (B) Bewick's wren (*Thryomanes bewickii*).
 - (3) Crustacea: Bennett's Mill cave water slater (*Caecidotea carolinensis*).
 - (4) Fish:
 - (A) Blotchside logperch (*Percina burtoni*);
 - (B) Bridle shiner (*Notropis bifrenatus*);
 - (C) Dusky darter (*Percina sciera*);
 - (D) Orangefin madtom (*Noturus gilberti*);
 - (E) Paddlefish (*Polyodon spathula*);
 - (F) Robust redhorse (*Moxostoma robustum*);
 - (G) Rustyside sucker (*Thoburnia hamiltoni*);
 - (H) Stonecat (*Noturus flavus*).
 - (5) Mammals: None Listed At This Time.
 - (6) Mollusks:
 - (A) Atlantic pigtoe (*Fusconaia masoni*);
 - (B) Barrel floater (*Anodonta couperiana*);
 - (C) Brook floater (*Alasmodonta varicosa*);
 - (D) Carolina creekshell (*Villosa vaughaniana*);
 - (E) Fragile glyph (*Glyphyalinia clingmani*);
 - (F) Green floater (*Lasmigona subviridis*);
 - (G) Greenfield rams-horn (*Helisoma eucosmium*);
 - (H) Knotty elimia (*Elimia christyi*);
 - (I) Magnificent ramshorn (*Planorbella magnifica*);
 - (J) Neuse spike (*Elliptio judithae*);
 - (K) Purple wartyback (*Cyclonaias tuberculata*);

- (L) Savannah lilliput (*Toxolasma pullus*);
 - (M) Slippershell mussel (*Alasmidonta viridis*);
 - (N) Tennessee clubshell (*Pleurobema oviforme*);
 - (O) Tennessee heelsplitter (*Lasmigona holstonia*);
 - (P) Tennessee pigtoe (*Fusconaia barnesiana*);
 - (Q) Yellow lampmussel (*Lampsilis cariosa*);
 - (R) Yellow lance (*Elliptio lanceolata*).
- (7) Reptiles:
- (A) Eastern coral snake (*Micrurus fulvius fulvius*);
 - (B) Eastern diamondback rattlesnake (*Crotalus adamanteus*).

History Note: Authority G.S. 113-134; 113-291.2; 113-292; 113-333;
Eff. June 11, 1977;
Amended Eff. May 1, 2008; April 1, 2001; February 1, 1994; November 1, 1991; April 1, 1991;
June 1, 1990.

15A NCAC 10I .0104 THREATENED SPECIES LISTED

(a) The following species of resident wildlife are designated as federally listed threatened species:

- (1) Amphibians: None Listed At This Time.
- (2) Birds: Piping plover (*Charadrius melodus melodus*).
- (3) Crustacea: None Listed At This Time.
- (4) Fish:
 - (A) Spotfin chub (*Cyprinella monacha*); and
 - (B) Waccamaw silverside (*Menidia extensa*).
- (5) Mammals: None Listed At This Time.
- (6) Mollusks: Noonday globe (*Patera clarki nantahala*).
- (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 statelisted threatened species:

- (1) Amphibians:
 - (A) Carolina gopher frog (*Rana capito capito*);
 - (B) Eastern tiger salamander (*Ambystoma tigrinum tigrinum*);
 - (C) Junaluska salamander (*Eurycea junaluska*); and
 - (D) Wehrle's salamander (*Plethodon wehrlei*).
- (2) Birds:
 - (A) Bald eagle (*Haliaeetus leucocephalus*);
 - (B) Gullbilled tern (*Sterna nilotica aranea*-); and
 - (C) Northern saw-whet owl (*Aegolius acadicus*).
- (3) Crustacea: None Listed At This Time.
- (4) Fish:
 - (A) American brook lamprey (*Lampetra appendix*);
 - (B) Banded sculpin (*Cottus carolinae*);
 - (C) Bigeye jumprock (*Scartomyzon ariommus*);
 - (D) Blackbanded darter (*Percina nigrofasciata*);
 - (E) Carolina madtom (*Noturus furiosus*);
 - (F) Carolina pygmy sunfish (*Elassoma boehlkei*);
 - (G) Carolina redhorse (*Moxostoma* sp.) (Pee Dee River and its tributaries and Cape Fear River and its tributaries);
 - (H) Least brook lamprey (*Lampetra aepyptera*);
 - (I) Logperch (*Percina caprodes*);
 - (J) Rosyface chub (*Hybopsis rubrifrons*);
 - (K) Sharphead darter (*Etheostoma acuticeps*);

- (L) Sicklefins redhorse (*Moxostoma* sp.) (Hiwassee River and its tributaries and Little Tennessee River and its tributaries);
- (M) Turquoise darter (*Etheostoma inscriptum*); and
- (N) 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 (*Anodonta implicata*);
 - (B) Bigtooth covert (*Fumonelix jonesiana*-);
 - (C) Cape Fear threetooth (*Triodopsis soelneri*);
 - (D) Carolina fatmucket (*Lampsilis radiata conspicua*);
 - (E) Clingman covert (*Fumonelix wheatleyi clingmanicus*);
 - (F) Eastern lampmussel (*Lampsilis radiata radiata*);
 - (G) Eastern pondmussel (*Ligumia nasuta*);
 - (H) Engraved covert (*Fumonelix orestes*);
 - (I) Mountain creekshell (*Villosa vanuxemensis*);
 - (J) Roan supercoil (*Paravitrea varidens*);
 - (K) Roanoke slabshell (*Elliptio roanokensis*);
 - (L) Sculpted supercoil (*Paravitrea ternaria*);
 - (M) Seep mudalia (*Leptoxis dilatata*);
 - (N) Smoky Mountain covert (*Inflectarius ferrissi*);
 - (O) Squawfoot (*Strophitus undulatus*);
 - (P) Tidewater mucket (*Leptodea ochracea*);
 - (Q) Triangle floater (*Alasmodonta undulata*);
 - (R) Waccamaw ambersnail (*Catinella waccamawensis*);
 - (S) Waccamaw fatmucket (*Lampsilis fullerkati*);
 - (T) Waccamaw spike (*Elliptio waccamawensis*).
- (7) Reptiles: None Listed At This Time.

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

15A NCAC 10I .0105 SPECIAL CONCERN SPECIES LISTED

The following species of resident wildlife are designated as statelisted special concern species:

- (1) Amphibians:
 - (a) Crevice salamander (*Plethodon longicrus*);
 - (b) Dwarf salamander (*Eurycea quadridigitata*);
 - (c) Eastern hellbender (*Cryptobranchus alleganiensis alleganiensis*);
 - (d) Fourtoed salamander (*Hemidactylum scutatum*-);
 - (e) Longtail salamander (*Eurycea longicauda longicauda*);
 - (f) Mole salamander (*Ambystoma talpoideum*);
 - (g) Mountain chorus frog (*Pseudacris brachyphona*);
 - (h) Mudpuppy (*Necturus maculosus*);
 - (i) Neuse River waterdog (*Necturus lewisi*);
 - (j) River frog (*Rana heckscheri*);
 - (k) Southern zigzag salamander (*Plethodon ventralis*);
 - (l) Weller's salamander (*Plethodon welleri*).
- (2) Birds:
 - (a) American oystercatcher (*Haematopus palliatus*);
 - (b) Bachman's sparrow (*Aimophila aestivalis*);
 - (c) Blackcapped chickadee (*Poecile atricapillus*-);

- (d) Black rail (*Laterallus jamaicensis*);
 - (e) Black skimmer (*Rynchops niger*);
 - (f) Brown creeper (*Certhia americana nigrescens*);
 - (g) Cerulean warbler (*Dendroica cerulea*);
 - (h) Common tern (*Sterna hirundo*);
 - (i) Glossy ibis (*Plegadis falcinellus*);
 - (j) Golden-winged warbler (*Vermivora chrysoptera*);
 - (k) Henslow's sparrow (*Ammodramus henslowii*);
 - (l) Least bittern (*Ixobrychus exilis*);
 - (m) Least tern (*Sterna antillarum*);
 - (n) Little blue heron (*Egretta caerulea*);
 - (o) Loggerhead shrike (*Lanius ludovicianus*);
 - (p) Olivesided flycatcher (*Contopus cooperi*-);
 - (q) Painted bunting (*Passerina ciris*);
 - (r) Red crossbill (*Loxia curvirostra*);
 - (s) Snowy egret (*Egretta thula*);
 - (t) Tricolored heron (*Egretta tricolor*);
 - (u) Vesper sparrow (*Pooecetes gramineus*);
 - (v) Wilson's plover (*Charadrius wilsonia*);
 - (w) Yellow-bellied sapsucker (*Sphyrapicus varius appalachiensis*).
- (3) Crustacea:
- (a) Broad River spiny crayfish (*Cambarus spicatus*);
 - (b) Carolina skistodiaptomus (*Skistodiaptomus carolinensis*);
 - (c) Carolina well diacyclops (*Dacyclops jeannelli putei*);
 - (d) Chowanoke crayfish (*Orconectes virginienensis*);
 - (e) Graceful clam shrimp (*Lynceus gracilicornis*);
 - (f) Greensboro burrowing crayfish (*Cambarus catagius*);
 - (g) Hiwassee headwaters crayfish (*Cambarus parrishi*);
 - (h) Little Tennessee River crayfish (*Cambarus georgiae*);
 - (i) North Carolina spiny crayfish (*Orconectes carolinensis*);
 - (j) Oconee stream crayfish (*Cambarus chaugaensis*);
 - (k) Waccamaw crayfish (*Procambarus braswelli*).
- (4) Fish:
- (a) Atlantic sturgeon (*Acipenser oxyrinchus*);
 - (b) Bluefin killifish (*Lucania goodei*);
 - (c) Blue Ridge sculpin (*Cottus caeruleomentum*);
 - (d) Blueside darter (*Etheostoma jessiae*);
 - (e) Broadtail madtom (*Noturus sp.*) (Lumber River and its tributaries and Cape Fear River and its tributaries);
 - (f) Carolina darter (*Etheostoma collis*);
 - (g) Cutlip minnow (*Exoglossum maxillingua*);
 - (h) Freshwater drum (*Aplodinotus grunniens*) (French Broad River);
 - (i) Highfin carpsucker (*Carpodes velifer*) (Cape Fear River and its tributaries);
 - (j) Kanawha minnow (*Phenacobius teretulus*);
 - (k) Lake sturgeon (*Acipenser fulvescens*);
 - (l) Least killifish (*Heterandria formosa*);
 - (m) Longhead darter (*Percina macrocephala*);
 - (n) Mooneye (*Hiodon tergisus*);
 - (o) Mountain madtom (*Noturus eleutherus*);
 - (p) Olive darter (*Percina squamata*);
 - (q) Pinewoods darter (*Etheostoma mariae*);
 - (r) River carpsucker (*Carpodes carpio*);
 - (s) Riverweed darter (*Etheostoma podostemone*);
 - (t) Sandhills chub (*Semotilus lumbee*);
 - (u) Sharpnose darter (*Percina oxyrhynchus*);
 - (v) Smoky dace (*Clinostomus sp.*) (Little Tennessee River and tributaries);

- (w) Striped shiner (*Luxilus chrysocephalus*);
- (x) Tennessee snubnose darter (*Etheostoma simoterum*);
- (y) Thinlip chub (*Cyprinella zanema*) (Lumber River and its tributaries and Cape Fear River and its tributaries);
- (z) Waccamaw killifish (*Fundulus waccamensis*);
- (aa) Wounded darter (*Etheostoma vulneratum*);
- (bb) Yellowfin shiner (*Notropis lutipinnis*) (Savannah River and its tributaries);
- (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 smallfooted bat (*Myotis leibii leibii*-);
 - (f) Elk (*Cervus elaphus*);
 - (g) Florida yellow bat (*Lasiurus intermedius floridanus*);
 - (h) Pungo white-footed mouse (*Peromyscus leucopus easti*);
 - (i) Southeastern bat (*Myotis austroriparius*);
 - (j) Southern rock shrew (*Sorex dispar blitchi*);
 - (k) Southern rock vole (*Microtus chrotorrhinus carolinensis*);
 - (l) Southern water shrew (*Sorex palustris punctulatus*);
 - (m) Starnosed mole (*Condylura cristata parva*-).
- (6) Mollusks:
 - (a) Appalachian gloss (*Zonitoides patuloides*);
 - (b) Bidentate dome (*Ventridens coelaxis*);
 - (c) Black mantleslug (*Pallifera hemphilli*);
 - (d) Blackwater ancyliid (*Ferrissia hendersoni*);
 - (e) Bluefoot lancetooth (*Haplotrema kendeighi*-);
 - (f) Cape Fear spike (*Elliptio marsupiobesa*);
 - (g) Dark glyph (*Glyphyalinia junaluskana*);
 - (h) Dwarf proud globe (*Patera clarki clarki*);
 - (i) Dwarf threetooth (*Triodopsis fulciden*);
 - (j) Fringed coil (*Helicodiscus fimbriatus*);
 - (k) Glossy supercoil (*Paravitrea placentula*);
 - (l) Great Smoky slitmouth (*Stenotrema depilatum*);
 - (m) High mountain supercoil (*Paravitrea andrewsae*);
 - (n) Honey glyph (*Glyphyalinia vanattai*);
 - (o) Lamellate supercoil (*Paravitrea lamellidens*);
 - (p) Mirey Ridge supercoil (*Paravitrea clappi*);
 - (q) Notched rainbow (*Villosa constricta*);
 - (r) Open supercoil (*Paravitrea umbilicaris*);
 - (s) Pink glyph (*Glyphyalinia pentadelphia*);
 - (t) Pod lance (*Elliptio folliculata*);
 - (u) Queen crater (*Appalachina chilhoweensis*);
 - (v) Rainbow (*Villosa iris*);
 - (w) Ramp Cove supercoil (*Paravitrea lacteodens*);
 - (x) Sawtooth disc (*Discus bryanti*-);
 - (y) Spike (*Elliptio dilatata*);
 - (z) Spiral coil (*Helicodiscus bonamicus*);
 - (aa) Velvet covert (*Inflectarius subpalliat*);
 - (bb) Waccamaw amnicola (*Amnicola* sp.);
 - (cc) Waccamaw lampmussel (*Lampsilis crocata*);
 - (dd) Waccamaw siltsnail (*Cincinnatia* sp.);
 - (ee) Wavyrayed lampmussel (*Lampsilis fasciola*-).
- (7) Reptiles:
 - (a) Carolina pigmy rattlesnake (*Sistrurus miliarius miliarius*);
 - (b) Carolina watersnake (*Nerodia sipedon williamengelsi*);

- (c) Diamondback terrapin (*Malaclemys terrapin*);
- (d) Eastern smooth green snake (*Opheodrys vernalis vernalis*);
- (e) Eastern spiny softshell (*Apalone spinifera spinifera*);
- (f) Mimic glass lizard (*Ophisaurus mimicus*);
- (g) Northern pine snake (*Pituophis melanoleucus melanoleucus*);
- (h) Outer Banks kingsnake (*Lampropeltis getula sticticeps*);
- (i) Southern hognose snake (*Heterodon simus*);
- (j) Stripeneck musk turtle (*Sternotherus minor peltifer*);
- (k) Timber rattlesnake (*Crotalus horridus*).

History Note: Authority G.S. 113-134; 113-291.2; 113-292; 113-333;
Eff. September 1, 1989;
Amended Eff. May 1, 2008; July 18, 2002; April 1, 2001; November 1, 1991; April 1, 1991; June 1, 1990.

Appendix D – NCWRC Resolution Regarding the Nongame Wildlife Advisory Committee



RESOLUTION REGARDING THE NONGAME WILDLIFE ADVISORY COMMITTEE

WHEREAS, the enjoyment of the wildlife resources of the State belongs to all of the people of North Carolina [G.S. 113- 133.1 (a)]; and

WHEREAS, the North Carolina Wildlife Resources Commission (Commission) is charged by statute (G.S. 113-132 and 113-331) with conserving fish and wildlife resources in the state and providing opportunities for wildlife recreation; and

WHEREAS, since 1983 the Commission has met conservation priorities by investing in the Commission's technical expertise and research along with cooperative partnerships and collaborative research; and

WHEREAS, the Commission's Strategic Plan and NC Wildlife Action Plan provide a conservation blueprint to guide and direct wildlife diversity conservation priorities statewide, emphasizing best available science; and

WHEREAS, the North Carolina Nongame Wildlife Advisory Committee (NWAC) was created by the General Assembly in 1987, and defined by statute as an "advisory board of knowledgeable and representative citizens established by resolution of the Wildlife Resources Commission and charged to consider matters relating to nongame wildlife conservation and to advise the Commission on such matters" [G.S. 113-331]; and

WHEREAS, the NWAC shall also advise the Commission on matters related to the creation of protected animal lists and development of conservation programs. [G.S. 113-335].

NOW, THEREFORE, BE IT RESOLVED by the North Carolina Wildlife Resources Commission in Raleigh on October 30, 2014 to hereby reaffirm the NWAC by resolution to perform the following functions as determined appropriate and advisable by the Commission:

1. To provide advice and assistance through NWAC business meetings, Commission business and committee meetings, and as requested by the Commission;
2. To make recommendations to the Commission on protected animal lists implemented in accordance with NWAC's Procedures and Schedule;
3. To conduct business as set forth in the NWAC Procedures and Schedules document;
4. To provide an external perspective from the scientific community and make any other relevant recommendations to the Executive Director through official action of the NWAC;
5. To provide advice to the Commission on activities or matters of conservation concern expected to have an impact on NC's wildlife diversity; and
6. To support the Commission's conservation initiatives through peer review, expert elicitations, project implementation, partner engagement, and outreach.

BE IT FURTHER RESOLVED that the Commission shall provide adequate resources and support to ensure NWAC has the information necessary to conduct business as described in a NWAC Procedures and Schedule.

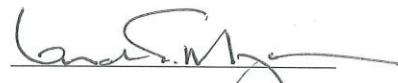
BE IT FURTHER RESOLVED that the NWAC shall consist of fifteen (15) citizens of North Carolina, who shall be appointed to serve staggered terms of three years as follows:

1. One-third (1/3) of Committee seats will expire each year and be considered for re-appointment or open nomination;
2. Nominations shall be accepted from the conservation community at-large for no less than 30 days prior to July 1 of each year;
3. The request for nominations shall include information regarding affiliation and expertise desired by the Commission;
4. The Executive Director shall submit a list of all nominated individuals to the Commission with his recommendation on new Committee members that shall include representation from key agencies and organizations;
5. The committee is expected to include members with a comprehensive knowledge on matters dealing with wildlife conservation; and
6. Appointment of members will be based on credentials, expertise, affiliation, and constituency at-large.

This resolution, introduced by Chairman James Cogdell, was passed unanimously by the North Carolina Wildlife Resources Commission in a meeting duly assembled on October 30, 2014 in Raleigh, North Carolina.



James Cogdell, Chairman



Gordon Myers, Executive Director

Appendix E – NWAC Procedures and Schedule

NONGAME WILDLIFE ADVISORY COMMITTEE PROCEDURES & SCHEDULE

Originally Approved by NWAC on April 22, 1988

Revised October 29, 2014

Mission Statement and Committee Purpose

Per G.S. 113-335, the Nongame Wildlife Advisory Committee (NWAC or Committee) is to be “composed of knowledgeable and representative citizens of North Carolina whose responsibility shall be to advise the Commission on matters related to conservation of nongame wildlife species in the state”. Additionally, the powers and duties of the NWAC are listed in G.S. 113-336. The NWAC was established through resolution by the North Carolina Wildlife Resources Commission (WRC or Commission) on July 14, 1986. This resolution was revised and reaffirmed in 2014 by vote of the Habitat, Nongame and Endangered Species Commission Committee (HNGES). WRC’s resolution enumerates several functions of the NWAC. Appendix D includes the resolution and General Statutes.

The NWAC serves in an advisory role to the WRC as outlined in G.S. 113-335. The NWAC has no rule-making authority and is requested to provide input and recommendations to the WRC regarding the conservation of nongame wildlife species and their habitats. Authority for enacting rules regarding protected animals or other matters rests with the WRC, pursuant to provisions of the Administrative Procedures Act (G.S. 150A). Furthermore, the NWAC serves as a conduit from the scientific community and bridges the gap with partnerships.

Operational Guidance

The NWAC will operate under the direction of a Committee Chairman through advice of the WRC Committee liaison. NWAC members are expected to provide advice to the Commission during NWAC business meetings, Board of Commission meetings, and as requested by Commission staff. All official NWAC recommendations will be shared from the Committee Chair, or the Chair’s delegate, to the Commission’s Executive Director, Chairman of the Habitat, Nongame, Endangered Species Committee, or WRC’s Committee liaison.

The Commission will provide the following resources and support to the NWAC to ensure they have the information necessary to conduct business:

1. A WRC Committee liaison on staff to assist in facilitating the broader interaction with the Commission and overseeing NWAC operations per the forming resolution;
2. Wildlife Diversity project updates no less than annually along with revenue reports for the Nongame and Endangered Wildlife Fund;
3. A meeting room as requested for business, executive and subcommittee meetings; and
4. Archival storage and some technical support for the NWAC records and reporting.

Appointment and Term of Service

Per the NWAC Resolution, the WRC can appoint up to 15 members to the NWAC upon the recommendation of the Executive Director. All terms are for three years, which shall run from July 1 through June 30. Persons may be reappointed to the Committee for additional terms.

Each November, the NWAC Chairperson will review the membership of NWAC to determine which positions will be up for appointment during the upcoming year. Those members whose terms are set to expire will be notified.

Nominations for upcoming appointments will be solicited via announcement on the WRC website for a period of no less than 30 days, with the nomination period closing no later than April 30. NWAC members may assist in recruiting nominees. Applicants, including those seeking re-appointment, must complete an NWAC nomination form with references and provide a current resume or curriculum vitae.

Membership on the Committee would be solicited from the leadership of five (5) government affiliates. These five (5) seats will be considered priority Committee seats and reserved. Each of these affiliates will be allowed to have alternate representatives identified and recommended to the Commission for their agencies:

1. NC Department of Agriculture & Consumer Services
2. NC Department of Environment and Natural Resources' Office of Land and Water Stewardship
3. NC Department of Environment and Natural Resources' for Natural Resources
4. NC Department of Transportation
5. U.S. Fish and Wildlife Service

Up to five (5) Committee seats will be available to incorporate biological, regional, academic, scientific and habitat expertise and/or experience. These will be solicited through an annual nomination process as seats are available.

Five (5) or more at-large seats (depending on available seats) will be filled with qualified professionals from other representative organizations. These seats will be solicited through an annual nomination process as seats are available.

1. Other federal natural resource agencies
2. Land Trust serving North Carolina
3. Conservation Nongovernmental organization
4. Industry (operations/management that have landscape scale effects)
5. Other (provides stakeholder voice in NC resource conservation)

An additional reference regarding membership is included in Item 1.

Nominations received will be considered by the Executive Director. Upon WRC approval, the Executive Director or his designee will notify members of their appointments. The EXE Chairperson and the WRC Committee liaison will advise new NWAC members on their responsibilities and expectations, and orient them to available NWAC resources.

If an NWAC seat is vacated prior to the end of the appointed term, the EXE may recommend candidates to the Executive Director to fill any such vacancy within 90 days after the vacancy. The Executive Director may recommend appointment of a successor for Commission approval.

Committee Meetings

The NWAC meets on a quarterly basis, generally in the months of February, April, August, and November, unless rescheduled by the Chairperson. These meetings will generally be on the third Thursday and will be single-day sessions, except in special instances upon concurrence of the Committee or as requested from WRC. However, one over-night committee meeting may be scheduled to allow members an opportunity to conduct a site visit of interest. Most quarterly meetings will occur in the WRC Office Building located on the N.C. State University Centennial Campus. NWAC meetings may be located elsewhere in the state upon direction from the Chairperson. The NWAC and EXE may meet between regularly scheduled quarterly meetings, as necessary to ensure NWAC business activities are carried out in an effective manner.

The NWAC Chairperson will send an electronic notice to NWAC members at least 5 working days prior to the next scheduled committee meeting. The notice will include an agenda and draft meeting minutes from the previous meeting, or a link to those materials.

Meeting minutes shall be taken by the NWAC Secretary or delegate at every Committee, Subcommittee, and EXE meeting and provided to the respective committee members for review and comment. Revisions will be noted in the meeting minutes. Within 30 days after each meeting, approved meeting minutes will be sent by the NWAC Chairperson to the Wildlife Diversity Program Manager for circulation and archival.

The conduct of NWAC, EXE, Subcommittee and Scientific Council meetings shall follow Robert's Rules of Order. Voting will be done after the establishment of a quorum, which shall be two-thirds of the appropriate committee's members. That committee's Chairperson will determine whether a quorum is present. A Subcommittee or Scientific Council votes shall be approved upon majority of the members in attendance. Any votes by subcommittee or taxa committee will pass upon a majority vote.

A committee member may assign his or her voting authority for a meeting they are unable to attend (aka proxy vote) via email to another committee member. Voting may also be done outside of regularly scheduled Committee meetings if necessary to ensure that business of the committee remains on schedule. Such votes can be obtained via conference telephone call, or through an electronic voting poll. Absentee and proxy voting shall not be allowed for selecting award recipients or for recommending seats on the Committee. Notification of an upcoming meeting will also serve as notification that a vote may take place and all members should plan accordingly.

Meeting Attendance and Constructive Participation

Members are expected to attend and participate in all Committee meetings. Failure to attend at least two meetings each year without notification to the NWAC Chairperson may be considered grounds for termination of appointment. Failure to support the mission of the NWAC as defined in G.S. 113, Article 25, by not constructively participating in and supporting Committee affairs will be considered grounds for termination of appointment. The NWAC Chairperson, with the advice and consent of the Committee, will recommend to the Executive Director when a change in membership on NWAC should be considered under conditions of extended absences and participation along with providing the Committee member with the reasons for the recommendation in writing.

Non-Committee members can attend NWAC meetings as observers. Representatives from state and federal agencies, private nongovernmental organizations, and universities with interests related to nongame wildlife and endangered species may be specifically invited to participate in the regular business of the NWAC and any of its subcommittees as advisors. Requests for participation by non-Committee representatives on a topical issue or a scheduled Committee business meeting will be made by the NWAC Chairperson or WRC's Committee liaison.

Officers

The NWAC will elect Officers consisting of a Chairperson, Vice Chairperson, and Secretary at the first regularly scheduled NWAC meeting in even-numbered years. Term of office will be two years. Officers may serve a maximum of two consecutive terms in the same office.

The Chairperson shall preside at NWAC meetings and have general charge and supervision overall of the affairs of the NWAC. The Vice Chairperson shall assume the duties of the Chairperson if he or she is temporarily or permanently unable to do so. The Secretary shall perform duties relating to administration of the general record keeping of the NWAC and shall record the minutes of the NWAC and EXE meetings.

Executive Committee

The NWAC shall establish an Executive Committee (EXE) composed of the Officers, two at-large Committee members, and the immediate Past-Chairperson. The at-large members will be nominated and elected by the NWAC at the first regularly scheduled Committee meeting in odd-numbered years.

The EXE may take administrative actions and vote on matters outside of the entire Committee, given that such actions are necessary to ensure the business continuity and functioning of the NWAC. Any actions taken by the EXE shall be reported to the NWAC as soon as reasonably possible. If, after notification, the NWAC wishes to discuss the EXE action, the NWAC can make a motion to endorse, amend, or modify an EXE action, given there is adequate justification of such a motion.

Subcommittees

The NWAC may vote to establish standing or ad hoc subcommittees, as the work of the Committee requires. Standing subcommittees conduct those functions that are essential to the business of the Committee and are recognized to exist for the long-term. Ad hoc subcommittees serve for a defined period of time to work on a specific task and then disband. In establishing a subcommittee, the NWAC will develop and approve a written charge statement, with goals and schedule, for the subcommittee to follow.

Subcommittees will be composed of a chairperson who is an NWAC member and at least one other NWAC member. Subcommittee chairpersons and members shall be appointed by the NWAC Chairperson. The NWAC Chairperson may invite persons outside the committee members to serve on subcommittees as advisors. Generally, appointments of standing subcommittee chairpersons and members will be made at the first Committee meeting of a new calendar year, but may be made at other quarterly meetings. Appointments of ad hoc subcommittee chairpersons and other members may be made at any time.

Subcommittees will meet on dates scheduled by the subcommittee chairperson, and may conduct their business by telephone conference calls, email or other electronic media means.

Scientific Council will be a standing committee and others as needed.

Scientific Council

Per G.S. 113-334 and 113-336, the NWAC shall establish a Scientific Council to evaluate and recommend to the NWAC those species that warrant designation as Endangered, Threatened, or Special Concern status following the definitions provided in G.S. 113-331. The Scientific Council shall be appointed, as needed, to address the following nongame wildlife taxonomic groups: (1) amphibians and reptiles, (2) birds, (3) crustaceans, (4) freshwater fishes, (5) mammals, and (6) mollusks. Each of the wildlife categories shall have its own Taxa Subcommittee. The Scientific Council will consist of the Chairpersons from each of the Taxa Subcommittees. The EXE will elect an NWAC member as the Scientific Council Chairperson.

Taxa Subcommittee Chairpersons and members must be considered experts in their respective fields who can provide scientifically meaningful input into species listings, and are able to effectively participate for the length of Scientific Council work activities. Taxa Subcommittee members do not need to be NWAC members.

The NWAC EXE will solicit nominations for Taxa Subcommittee Chairpersons and members at least 60 days prior to the appointment date. Nominations for Taxa Subcommittee members can be made by NWAC members, the Executive Director or WRC staff, or by peers or themselves. The NWAC will select Taxa Subcommittee Chairpersons through a majority vote.

The Scientific Council Chairperson, NWAC Chairperson, and WRC Wildlife Diversity Program Manager(s) will make recommendations on members for the Taxa Subcommittee, which will be reviewed and approved by the NWAC. Each Taxa Subcommittee will be assigned at least one WRC employee as a member.

The Scientific Council Chairperson will be responsible for: (1) establishing the work schedule for Scientific Council; (2) coordinating meetings with each Taxa Subcommittee Chairperson and WRC Wildlife Diversity Program Manager; (3) ensuring each Taxa Subcommittee Chair meets the required work schedule dates; (4) coordinating Taxa Subcommittee draft reports for review by the NWAC; and (5) submitting Taxa Subcommittee final reports to the NWAC Chairperson.

The NWAC will consult with the appropriate state and federal agencies charged with species conservation, as necessary, in making their final recommendations to the WRC. Any changes by NWAC to the recommendations should be documented. The NWAC Chairperson will transmit the final reports to the WRC for review and action.

It will be the responsibility of each Taxa Subcommittee Chairperson to ensure their respective group meets the work schedule and target dates for delivery of reports. The Taxa Subcommittee Chairperson will provide updates to the Scientific Council Chairperson on a monthly basis while each Taxa Subcommittee is performing its assigned work. Those progress reports will be forwarded to the NWAC Chairperson and EXE to inform them of work progress. Schedule and work conflicts will be resolved through discussions with the Scientific Council Chairperson, the WRC Wildlife Diversity Program Manager, and the respective Taxa Subcommittee Chairperson. Any changes in work schedule must be reviewed and approved by the EXE.

The general process and steps for Scientific Council recommendations on state listing are outlined in Item 2.

Administrative Matters

Members of the Committee are entitled to receive necessary travel and subsistence expenses in accordance with G.S. 138-5 and G.S. 138-6 to be paid from the Nongame Account of the Wildlife Resources Fund. However, those Committee members whose appointments are considered within the scope of their job and professional duties are encouraged to pay for routine travel expenses and be reimbursed by their employers. All members are encouraged to pursue valuing their time and expenses as in-kind match to WRC's federal funds for the Wildlife Diversity Program, where applicable.

NWAC documents shall be housed on a website hosted and administered by the WRC. It shall include meeting minutes, a handbook of procedures, current roster, other administrative information, and subcommittee materials.

Thomas L. Quay Wildlife Diversity Award

The WRC is responsible for administering the Thomas L. Quay Wildlife Diversity Award (Quay Award). The Award, the WRC's most prestigious, recognizes those individuals, professional or nonprofessional, who have distinguished themselves through wildlife diversity conservation work in North Carolina. The award is named for a former professor of zoology at N.C. State University, Dr. Thomas L. Quay, an internationally respected ornithologist whose influence fostered and inspired generations of wildlife biologists. The Quay Award was enacted by the WRC during 2006, and Dr. Quay was the first award recipient. Individuals who are first time nominees or nominees from the previous two years, who did not receive the Quay Award, are eligible for nomination.

The NWAC will recommend a Quay Award recipient to the WRC Executive Director from the list of nominees. The Committee will also assist, as requested, in drafting a resolution concerning the recipient to be approved by the WRC.

Item 1

Reference for Committee Seats

Membership on the Committee would be solicited from the leadership of five (5) government affiliates. These five (5) seats will be considered priority Committee seats and reserved. Each of these affiliates will be allowed to have alternate representatives identified and recommended to the Commission for their agencies:

1. NC Department of Agriculture & Consumer Services
sister state agency with mission to oversee land use and natural resource conservation
2. NC Department of Environment and Natural Resources' Office of Land and Water Stewardship
overlapping state mission of conserving natural resources
3. NC Department of Environment and Natural Resources' for Natural Resources
overlapping mission of advancing wildlife science
4. NC Department of Transportation
agency with the largest land use conversion influence in NC
5. U.S. Fish and Wildlife Service
federal agency with overlapping mission to conserve wildlife resources

Up to five (5) Committee seats will be available to incorporate biological, regional, academic, scientific and habitat expertise and/or experience. These will be solicited through an annual nomination process as seats are available.

Five (5) or more at-large seats (depending on available seats) will be filled with qualified professionals from other representative organizations. These seats will be solicited through an annual nomination process as seats are available.

1. **Other federal natural resource agencies** which could include US Geological Survey, Natural Resource Conservation Service, Environmental Protection Agency, US Forest Service, National Park Service, etc, while ensuring member diversity.
2. **Land Trust serving North Carolina:** affiliate that puts land conservation in place for perpetuity
3. **Conservation Nongovernmental Organization:** one or more affiliates dealing with conservation trust funds, research development, and conservation policy
4. **Industry:** affiliate that deals with large tracts of land in terrestrial and aquatic systems
5. **Other:** affiliate providing a joint voice for a stakeholder interested in NC resource conservation:

Item 2

General process and steps for Scientific Council recommendations for recommending state species listings

Timeline	Listing Steps or Actions
July 31 (Year 1)	NWAC selects Scientific Council Chairperson and begins process of soliciting nominations for Taxa Subcommittee members.
Aug 31 (Year 1)	Nomination period closes for Taxa Subcommittee members.
Sep 30 (Year 1)	NWAC Chairperson, WRC Program Manager(s) and Scientific Council Chairperson review and recommend Taxa Subcommittee Chairpersons and members.
Oct 31 (Year 1)	NWAC selects: (1) Chairpersons of Taxa Subcommittees; (2) members of Taxa Subcommittees
Jan 15 (Year 2)	Scientific Council Chairperson meets with Taxa Subcommittees and WRC Program Managers to: (1) provide work scope and schedule to update the listing status of North Carolina Special Concern, Threatened, and Endangered species; (2) establish the format of species accounts and final report; and (3) provide other relevant materials to each Taxa Subcommittee, as necessary.
Mar 31 (Year 2)	Taxa Subcommittees meet to discuss status listings of species and assign species accounts as needed.
Nov 30 (Year 2)	Taxa Subcommittees complete species accounts and submit draft reports to the Scientific Council Chairperson.
Dec 31 (Year 2)	Scientific Council Chairperson and WRC Program Managers distribute draft reports to the NWAC for review.
Mar 31 (Year 3)	Draft reports with NWAC comments returned to Taxa Subcommittee Chairpersons for revision, as necessary.
Aug 31 (Year 3)	Revised reports received by Scientific Council Chairperson.
Nov 30 (Year 3)	Revised reports distributed to NWAC for review and approval; returned to Taxa Subcommittee Chairpersons for any final revisions, if necessary.
Dec 31 (Year 3)	Final reports forwarded from NWAC to WRC Executive Director and Program Manager(s). NWAC Chairperson and Scientific Council Chairperson meet with Executive Director and Program Manager(s) to review the species listing recommendations.
Jul 31 (Year 4)	WRC reviews report and approves, as appropriate, species listing recommendations.

Appendix F – Nongame Wildlife Advisory Committee Members

Nongame Wildlife Advisory Committee Membership Seats		as of Sept 01, 2015		
				Expiring Terms
Government Affiliate (five seats; WRC may select new agency or affiliate re-appts)		Primary Member	Alternate	
1. NC Department of Agriculture & Consumer Services	1	Dr. Karen Beck	TBD	2016
2. NC Department of Environment and Natural Resources' Office of Land and Water Stewardship	2	Judy Ratcliffe	TBD	2017
3. U.S. Fish and Wildlife Service	3	Dr. Wilson Laney	Sarah McRae	2017
4. NC Department of Environment and Natural Resources' for Natural Resources	4	Jeff Beane	Dr. Caren Cooper	2016
5. NC Department of Transportation	5	K. Neil Medlin	Jared Gray	2018
Expert Affiliate (up to five seats; require open nominations)				
Up to 5 (five) membership seats will be available to incorporate biological, regional, academic, research, scientific and habitat expertise and/or experience.	1	Ann Somers (piedmont, mountains, herps, academic)		2017
	2	Dr. David Webster (mammals, mountains, piedmont, coastal, academic)		2017
	3	J. Edward Corey III (NC statewide species inventory and monitoring across all taxa groups)		2018
	4	John Crutchfield (Piedmont, inland fisheries)		2016
At-large Affiliate (five or more)				
1. Other federal natural resource agencies				
2. Land Trust in North Carolina	1	Ken Bridle (Piedmont Land Conservancy)		2017
3. Conservation NGO	2	Dr. Elizabeth Kalies (The Nature Conservancy)		2018
4. Industry (operations/management that have landscape scale effects)	3	Kevin O'Kane (Weyerhaeuser)		2016
	4	Scott Fletcher (Duke Energy Progress)		2016
	5	Lane Sauls, Jr. (Ecological Engineering, LLP)		2018
Other (provides stakeholder voice in NC resource conservation)	6	James R. Pendergrass (Dan Nicholas County Park)		2018

Appendix G – Comparison of North Carolina Regulations to Federal Regulations and Those of Other Regional States

Government	Species Classifications	Classification System	Review Period	Entities Contributing to Listing Decisions	Definition of “Take”	Effect of Listing
Federal	Endangered, Threatened, Candidate	Expert biological opinion informed by best available science and 5-factor analysis	Listed species reviewed every 5 years once listed	Biologist assessment, petition process, candidate assessment process (annual). State fish and wildlife agencies (lists), other federal agencies, universities, and tribes. Use State Natural Heritage Programs databases and State Wildlife Action Plans; assign “listing priority numbers”; eventually ends in rulemaking.	ESA Sec. 3(19) To harass, harm [an act which actually kills or injures wildlife. Such an act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering], pursue, hunt, shoot, wound, kill, trap, capture, or collect or attempt to engage in any such conduct.”	<ol style="list-style-type: none"> 1. Prohibiting take, harassment, purchase/sale, importation/exportation, etc. without a permit 2. Enforcing the regulations and establishing penalties 3. Developing recovery plans 4. Conducting research 5. Requiring other agencies to consult with the fish and wildlife agency when actions are funded or permitted by the state 6. Identifying measures other state agencies shall implement to conserve listed species 7. Designating critical habitat 8. Protecting habitat through acquisition or conservation agreements 9. Creating tax incentives for conservation agreements 10. Developing economic incentives to protect listed species and habitats 11. Establishing a trust fund for protected species conservation activities
North Carolina	Endangered, Threatened, Special Concern	Expert biological opinion informed by best available science, IUCN with Regional Modification rankings, and public input	Periodically, as needed	Input from and recommendations by NWAC Scientific Council, public; ultimately decided by Commission	G.S. 113-130(7): All operations during, immediately preparatory, and immediately subsequent to an attempt, whether successful or not, to capture, kill, pursue, hunt, or otherwise harm or reduce to possession any fisheries resources or wildlife resources.	<ol style="list-style-type: none"> 1. Regulate the “taking, collection, or sale of protected animals” 2. Develop and implement conservation plans 3. Conduct studies

Government	Species Classifications	Classification System	Review Period	Entities Contributing to Listing Decisions	Definition of “Take”	Effect of Listing
South Carolina	Endangered, Threatened, Rare	Expert biological opinion informed by best available science, Nature-Serve rankings, and public input at public hearings	Every 2 years	Investigations by Department and public input at public hearings; requires consultation with other entities (agencies, NGOs, etc.)	ESA SECTION 50-15-10: To harass, hunt, capture, or kill or attempt to harass, hunt, capture, or kill wildlife.	1. Unlawful for any person to take, possess, transport, export, process, sell or offer for sale, or ship, and for any common or contract carrier knowingly to transport or receive for shipment any species or subspecies of [listed] wildlife 2. Establishment of such programs, including acquisition of land or aquatic habitat, as are deemed necessary for management of nongame and endangered wildlife
Florida	Endangered (Federal), Threatened (Federal), State-designated Threatened	Expert biological opinion informed by best available science, IUCN with Regional Modification rankings, and public input	As needed and includes a public petition process (petitions accepted January-June each year)	Biological review group conducts peer review using species evaluation requests, information obtained from the public, the definition of State-designated Threatened species (Rule 68A-27.001, F.A.C., and the best available scientific and commercial biological data on the status of the species	(68A-27-.001(4), F.A.C.) [state-Threatened species]: To harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in such conduct. (68A-1.004(79), F.A.C.) [Species of Special Concern]: Taking, attempting to take, pursuing, hunting, molesting, capturing, or killing any wildlife or freshwater fish, or their nests or eggs by any means whether or not such actions result in obtaining possession of such wildlife or freshwater fish or their nests or eggs	1. Requires a management plan 2. No take allowed except by permit 3. Listing affects activities allowed by permit from FWC

Government	Species Classifications	Classification System	Review Period	Entities Contributing to Listing Decisions	Definition of “Take”	Effect of Listing
Virginia	Endangered, Threatened	Expert biological opinion informed by best available science	As needed	Rule approval by Board of Directors following staff review of reliable data sources and recommendations from the Director of the Department of Conservation and Recreation § 29.1-566. Regulations. The Board [of Directors] is authorized to adopt the federal list, as well as modifications and amendments thereto by regulations; to declare by regulation, after consideration of recommendations from the Director of the Department of Conservation and Recreation and from other reliable data sources, that species not appearing on the federal lists are endangered or threatened species in Virginia; and to prohibit by regulation the taking, transportation, processing, sale, or offer for sale within the Commonwealth of any threatened or endangered species of fish or wildlife.	4VAC15-20-140: To harass [an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering], harm [an act which actually kills or injures wildlife. Such act may include significant habitat modifications or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering], pursue, hunt, shoot, wound, kill, trap, capture, possess or collect, or to attempt to engage in any such conduct.	1. Prohibit by regulation the taking, transportation, processing, sale, or offer for sale of any threatened or endangered species of fish or wildlife.
Tennessee	Endangered (Federal), Threatened (Federal and State), In Need of Management	Expert biological opinion informed by best available science, and IUCN with Regional Modification and NatureServe rankings	Every 2 years; has not been reviewed in 15 years but is currently under review	Best group of taxa experts is assembled	Tenn. Code Ann. § 70-8-103 To harass, hunt, capture, or kill, or to attempt to harass, hunt, capture, or kill wildlife	1. Unlawful for any person to take, harass, or destroy wildlife listed as threatened or endangered 2. Unlawful to destroy knowingly the habitat of such species without due consideration of alternatives for the welfare of the species listed 3. Consider “In Need of Management” species when planning development projects

Government	Species Classifications	Classification System	Review Period	Entities Contributing to Listing Decisions	Definition of “Take”	Effect of Listing
Georgia	Endangered, Threatened, Rare, Unusual	Expert biological opinion informed by best available science, Nature-Serve rankings, and public input	As needed. Last evaluation was in 2006.	Species can be nominated by anyone; but based on expert input. Reviewed by staff biologists. Final listing approval by DNR Board, except for changes to the Endangered list, which is a duplication of the Federal Endangered list and added automatically.	Section 27-1-2, Definitions: (71) Killing, capturing, destroying, catching, or seizing	1. Unlawful to harass, capture, kill, or otherwise directly cause the death of any protected animal species, except as specifically authorized by law or regulation adopted by the Board of Natural Resources 2. Protected animal species or parts of protected animal species cannot be sold, purchased, or possessed unless authorized by a permit issued from the Department of Natural Resources. 3. The destruction of the habitat of any protected animal species on public lands is prohibited.
Alabama	Endangered (Federal), Threatened (Federal), Protected by AL Regulation*	Expert biological opinion informed by best available science, Nature-Serve rankings, and public input	Every 10 years; Nongame Wildlife Conference Annual review of Species list for Nongame Wildlife Regulation (220-2-.92 Protected by Alabama regulation)	Experts, academia, state wildlife biologists and others participate in the Nongame Wildlife Conference; Annual list review is based on Nongame staff recommendations Our nongame staff meets annually with law enforcement to review and discuss the species list (derived from the nongame conference) for the Nongame Wildlife Regulation (220-2-.92). During this time the nongame staff provides recommendations re updates or changes to the reg.	ADCNR Administrative Code Ch 220-2 Game and Fish Division The term “take” is used throughout, though it not specifically defined except in regards to falconry (“to trap or capture, or attempt to trap or capture, a raptor for the purpose of falconry.”)	1. Unlawful to take, capture, kill, or attempt to take, capture or kill any species “Protected by AL Regulation” 2. Unlawful to possess, sell, trade for anything of monetary value, or offer to sell or trade for anything of monetary value, any species “Protected by AL Regulation” (or any parts or reproductive products of such species) without a scientific collection permit or written permit

Appendix H – Protections Afforded by Listing

The North Carolina Endangered and Threatened Species List is an integral piece of the State's conservation policies. In addition to protecting against take, the list provides an important basis of protective efforts for many species that otherwise would not be afforded any other protections.

Prohibition from take is a major protection afforded to listed species. The Federal definition of "take" (ESA Sec. 3(19)) is: to harass, harm [an act which actually kills or injures wildlife. Such an act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering], pursue, hunt, shoot, wound, kill, trap, capture, or collect or attempt to engage in any such conduct."

Not only does Federal listing prohibit take, harassment, purchase, sale, importation and exportation without a permit, but also it establishes the need for recovery plans and research; requires other Federal agencies to consult with the USFWS when actions are financed, even in part, by Federal funds; identifies measures other Federal agencies shall implement to conserve listed species, designates critical habitat, protects habitat through acquisition or conservation agreements, creates tax incentives for conservation agreements, develops economic incentives to protect listed species and habitats, and establishes a trust fund for protected species conservation activities.

In comparison, North Carolina defines "take" as "all operations during, immediately preparatory, and immediately subsequent to an attempt, whether successful or not, to capture, kill, pursue, hunt, or otherwise harm or reduce to possession any fisheries resources or wildlife resources." (G.S. 113-130(7)). North Carolina does not extend the definition of "take" to habitats. All states that we examined protect species from take, although there is no ubiquitous definition for take and some definitions are more robust than others. Georgia, Tennessee, and Virginia mirror the Federal protection of both species *and* their habitat. In addition to protection from take, listing also enables State agencies to fund research and put other protective mechanisms in place including conservation agreements, protected habitat designation on public lands and waters, and required consultation from private entities or other agencies when dealing with protected species or their habitats.

There are two basic modes of action enabled by G.S. 113 Article 25: conservation action and regulatory action. North Carolina's List allows for the development of all efforts that produce positive boots-on-the-ground results for endangered and threatened species conservation. These efforts include the development of recovery plans, conducting research, and protecting habitat. More subtly, the list also provides substantial regulatory protections. The North Carolina Endangered and Threatened Species List is referenced throughout state regulations and statutes in myriad ways. The State listings enable conservation actions by many conservation partners, for example consultation by other agencies with WRC staff to conserve listed species, tax incentives for conservation agreements by private landowners, and opportunities for local land trusts to conserve important natural habitats.

Statutes and regulations administered by federal agencies or other state agencies can extend various protections to state listed species. These protections can be generally grouped as

regulatory, planning, and advisory. Regulatory protections limit or prohibit certain activities, such as regulating sand fence installation so that it does not affect sea turtles or other species, and prohibiting excavation and fill in listed species habitat. The Solid Waste Management Program also regulates the placement of certain facilities to avoid impacting listed species. However, the number of these types of statutes and rules is relatively small and they often include provisions to allow the proposed activity, provided the impact to the listed species is reduced and mitigated to a reasonable extent. Federal regulations such as the Clean Water Act (CWA) require consultation with state agencies concerning state listed species when an activity (e.g., development, road projects) has a federal nexus (e.g., use of federal funds, application for federal permits, activity is by a federal agency). With only a few exceptions, these statutes and rules do not outright prohibit or limit certain activities. For example, the NCDOT will be required to avoid or minimize impacts to the extent possible for roadway projects that require a CWA Section 404/401 permit, but projects are not prohibited solely because of the presence of state listed species.

Planning regulations are those that require an agency to consider listed species when developing or reviewing management alternatives. Examples include reviewing land acquisition proposals, developing coastal habitat protection plans, and reviewing proposals for interbasin transfer of water. The presence of listed species provides information into the overall health and biodiversity of a habitat community, which in turn informs conservation efforts. Other state agencies may implement planning regulations that consider listed species to define a management class, such as designating areas of environmental concern (Division of Coastal Management), natural areas or nature preserves (Natural Heritage Program); and designating waters as Outstanding Resource Waters or High Quality Waters (Division of Water Resources).

Regulations that are advisory in nature are generally of two types. Some describe the benefits of listed species or how an activity can benefit listed species, such as advising the Commissioner of Agriculture to restore forests and protect listed species. Others provide technical guidance that instruct an agency in the process to be used (or avoided) when dealing with listed species. For example, DENR regulations do not require a SEPA document when reviewing a proposal to reintroduce listed species according to a state or federal management plan.

State laws and regulations do not give the WRC authority to require other agencies to undertake certain activities to protect listed species. Furthermore, there is no uniform requirement for other state agencies to consult with the WRC when their actions may affect a listed species. Some individual agencies (e.g., DENR) have enacted such rules on their own, but it is not universal.

Appendix I – Wildlife Resources Commission Draft Policy Regarding Release of Rare Aquatic Species (dated August 3, 2000)

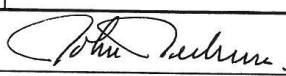
**July 19, 2000
WRC MEETING**

EXHIBIT H


"Aquatic Augmentation Policy "

FOR FURTHER REFERENCE, THIS EXHIBIT HAS BEEN PLACED IN A FILE FOR PERMANENT RECORD

PRESENTED BY:	David Cobb, Chief Division of Wildlife Management
PROPOSAL:	Consider endorsement of a draft policy to Guide the Release of Rare Aquatic Species.
	A motion was made by John Lentz to approve as agency policy the Guide for Release of Rare Aquatic Species as presented in Exhibit H. The motion was seconded by Jim Bennett and carried.


John Pechmann, Chairman

8.3.00
Date


Charles R. Fullwood, Executive Director

7-31-00
Date

Restoring North Carolina's Aquatic Ecosystems: A Draft Policy to Guide the Release of Rare Aquatic Species

Introduction

North Carolina provides a great diversity of aquatic habitats within the Mountains, Piedmont, and Coastal Plain. Differences in elevation, slope, aspect, geologic resources, soils, climate, associated plant communities, and numerous other variables have allowed development of aquatic habitats ranging from roaring, turbulent Mountain trout streams to silent, meandering Coastal Plain blackwater rivers.

Within the context of habitat preferences and through geologic time, many aquatic species have moved from one river basin to another. To a large extent, this movement has been facilitated by stream capture and river mouth confluence events. These processes help explain wide distributions of species such as bluehead chub, bowfin, longnose gar, and the dwarf wedgemussel.

Aquatic species diversity has also been enhanced by the isolation of species within unique habitats, such as our Atlantic Slope river basins. Through time, isolated populations have evolved into endemic North Carolina species. Examples include the Tar River spinymussel, Neuse River waterdog, Cape Fear shiner, and the Waccamaw silverside. Because of isolation and other biogeographic processes, the presence of a great number of different habitats, and unique ecological interactions, hundreds of aquatic insect, crayfish, sponge, mussel, snail, fish, amphibian, and other aquatic species are found in North Carolina.

Land and water uses in North Carolina have changed dramatically in recent centuries. Unforeseen impacts from agriculture, forestry, development, reservoir construction, and other land and water uses have led to the extirpation and even extinction of some aquatic species. Declines in population abundance and range of other species have led to the isolation of subpopulations. The result is that nearly a quarter of our 200 freshwater fish species and nearly half of our roughly 70 freshwater mussel species have become state or federally listed as endangered, threatened, or species of special concern. The actions that led to these declines continue into the present, and in many cases, are accelerating. Adverse impacts from land and water uses must be reduced or eliminated and active intervention to halt species declines may be necessary to restore populations of rare species.

The stocking of listed or candidate species into suitable habitats is recognized as a biologically sound and important option in active intervention in species declines. Stocking, in conjunction with habitat improvements, may increase the number of viable populations, ultimately resulting in the removal of rare species from endangered and threatened species lists and eliminating the need to list candidate species.

Two basic options are available for stocking listed and candidate species:

1. Augmentation of existing populations of a species and
2. Reintroduction of a species into appropriate habitats within its historic range

Before either option for stocking can be considered, landowner and local government concerns must be addressed. The following document components seek to address these concerns.

Augmentation of listed or candidate aquatic species' populations

Augmentation of existing populations of listed or candidate species is considered a biologically sound option for active intervention in species declines and may be submitted for North Carolina Wildlife Resources Commission (NCWRC) consideration when the following conditions are satisfied:

1. The range of the extant population is understood, based upon best available information. Survey protocol and effort should be documented in the project proposal.
2. The expected potential range of the species within the subbasin is understood given physical, chemical, and other barriers and is stated in the project proposal. Barriers to potential range expansions include dams and associated reservoirs, known major point sources of pollution or discharge, or highly degraded creeks or rivers.
3. If there are no significant physical or biological barriers preventing the expansion of a known population to a potential habitat, the NCWRC will focus efforts on the augmentation of that known population and on improvement of the potential habitat to facilitate 'natural' expansion of the known population into the potential habitat rather than on the release of animals directly into the potential habitat.
4. Habitat quality within the subbasin is considered adequate for the species and appears stable; or is expected to improve based upon planning and implementation of conservation improvement projects within the subbasin.
5. Augmentation of the species' population within the subbasin is considered a conservation priority by the NCWRC, and for federally listed or candidate species by the U.S. Fish & Wildlife Service (USFWS).
6. The Nongame Wildlife Advisory Committee recommends NCWRC approval of the augmentation project, based upon a written proposal submitted by staff of the NCWRC or USFWS. The written proposal should include: a) an evaluation of genetic considerations such as the potential for "swamping" the resident population and the genetic similarity of the source stock to the resident population (Source stock should be acquired from the resident population whenever possible, as determined by expert biological input, and from within the same river system at a minimum.) b) measures to be taken to ensure that disease is not introduced into the resident aquatic community, c) provisions to be taken to prevent accidental release of propagated species from hatcheries into non-native basins, and d) clearly expressed goals of the project and monitoring methods to be employed to document levels of success.
7. Landowners adjacent to proposed augmentation sites and local governments within the subbasin will be given the following written information:
 - a. current legal status of the subject species;
 - b. ecological needs of the subject species;
 - c. current plans for conservation of the subject species within the subbasin; and
 - d. a summary of the augmentation proposal.

8. Landowners at proposed augmentation sites and local governments within the subbasin will be given written and verbal information confirming that since listed species already occur in the subbasin, the legal requirements for listed species will continue to be implemented; but that the effort is expected to support downlisting of the species. Regarding augmentation of candidate species, the Commission will sponsor a cooperative agreement with the U.S. Fish & Wildlife Service and other entities to promote the conservation of the species and to reduce the need for species listing. Landowners and local governments will be informed that augmentation is expected to enhance extant populations and should decrease the probability of federal listing.
9. Landowners at proposed augmentation sites must give written permission to NCWRC or USFWS biologists allowing access across their property and approval for augmentation of a subject species' population adjacent to their property.
10. Until such time as there is documented proof of the effectiveness of augmentation toward the recovery of subject listed species and candidate species, the NCWRC will not consider augmentation of subject listed or candidate species' populations as mitigation for impacts to extant populations of the species.

Examples of potential augmentation projects

- The dwarf wedgemussel (*Alasmodonta heterodon*) is state and federally listed as endangered. This species is found in the Tar and Neuse river basins in North Carolina. A significant population of this species exists in Shocco Creek, a tributary of Fishing Creek in Franklin and Warren counties. The dwarf wedgemussel has a patchy distribution in Shocco Creek, with three subpopulations in tributary streams or creeks and with a subpopulation in the main Shocco Creek channel. In general, habitats appear to be improving throughout the Shocco Creek Subbasin, and no major land or water use changes are expected to alter this habitat assessment. Some of the subpopulations appear small, and there is a need to ensure gene flow among all Shocco Creek subpopulations. Therefore, augmentation of these subpopulations should be considered.

Dr. Richard Neves of Virginia Polytechnic and State University is developing techniques for captive propagation of freshwater mussels. This technology could be applied to listed or candidate mussel species in the near future, including the dwarf wedgemussel.

- The Cape Fear shiner (*Notropis mekistocholas*) is state and federally listed as endangered. This fish species exists as 5 isolated populations in the upper Cape Fear River Basin in North Carolina. One of these populations exists in the Deep River from Coleridge in Randolph County down to High Falls Reservoir on the Chatham / Moore county line. During 1997 and 1999, the Cape Fear shiner was found in the lower half of this habitat; however, it was not found in the upper half of this range. (A few individuals were found in the upper half of this range during 1994.) Habitat still appears good throughout this area of the Deep River, and water quality is expected to improve during coming years as a result of better management of upriver wastewater treatment plants and nonpoint sources of pollution. Therefore, there is a need to help maintain the Cape Fear shiner's recent range within the Deep River below Coleridge.

As a result of Cape Fear shiner captive propagation technology developed for toxicity testing studies, an excess 2,000 individual Cape Fear shiners are available for other purposes, such as stocking available habitats. These fish are being held at the Edenton National Fish Hatchery and the North Carolina State Zoo and could be used to augment the Cape Fear shiner population below Coleridge.

Reintroductions of listed or candidate aquatic species' populations

Reintroduction of listed or candidate species' populations is considered a biologically sound option for active intervention in species declines and may be submitted for consideration by the NCWRC when the following conditions are satisfied:

1. The subject species' proposed reintroduction habitat is within its historic range, as defined by expert biological input.
2. Based upon surveys completed during the previous 10 years, no individuals of the subject species have been found in the proposed reintroduction subbasin. Survey protocol and effort should be documented in the project proposal.
3. The expected potential range of a reintroduced species within the subbasin is understood given physical, chemical, and other barriers and is stated in the project proposal. Barriers to potential range expansions include dams and associated reservoirs, known major point sources of pollution or discharge, or highly degraded creeks or rivers.
4. Appropriate and adequate habitat for the listed or candidate species, as defined by expert biological input, is available within the subbasin.
5. Habitat quality within the subbasin appears stable or is expected to improve based upon planning and implementation of conservation improvement projects within the subbasin.
6. Reintroductions of the species within the subbasin is considered a conservation priority by the NCWRC, and for federally listed or candidate species by the USFWS.
7. The USFWS provides written explanation to the NCWRC of the potential for future protection, if any, that the reintroduced listed or candidate aquatic species' population will receive under the U.S. Endangered Species Act (Act).
8. The Nongame Wildlife Advisory Committee recommends NCWRC approval of the reintroduction project, based upon a written proposal submitted by staff of the NCWRC or USFWS. The written proposal should include: a) an evaluation of genetic considerations such as genetic similarity of the source stock to the extirpated population (The source stock should be acquired from within the same river system whenever possible and from adjacent river systems at a minimum.), b) measures to be taken to ensure that disease is not introduced into the resident aquatic community, c) provisions to be taken to prevent accidental release of propagated species from hatcheries into non-native basins, and d) clearly expressed goals of the project and monitoring methods to be employed to document levels of success.

9. Landowners adjacent to proposed reintroduction sites and local governments within the subbasin will be given the following written information:
 - a. Current legal status of the subject species;
 - b. Ecological needs of the subject species;
 - c. Current plans for conservation of the subject species within the subbasin; and
 - d. Copy of the reintroduction proposal
10. For federally listed species reintroductions not associated with designated critical habitats, the Commission will petition the Service for “experimental, non-essential” designation of the reintroduced population with regulatory exemption from the provisions of the Endangered Species Act. For federal candidate species reintroductions, the Commission will sponsor a cooperative agreement with the U.S. Fish & Wildlife Service and other entities to promote the conservation of the species and to reduce the need for species listing. Landowners adjacent to proposed reintroduction sites and local governments within the subbasin will be given written and verbal information by the USFWS explaining future protection, if any, the subject listed or candidate aquatic species’ populations will receive under the Act.
11. For federally listed or candidate species reintroductions, landowners adjacent to proposed reintroduction sites and local governments within the subbasin will be given written and verbal information by the USFWS confirming that any other listed species currently occurring within the subbasin will continue to be fully protected by the Act. Also, other species within the subbasin that may be listed in the future will be fully protected by the Act.
12. Landowners at proposed reintroduction sites must give permission to NCWRC or USFWS biologists allowing access across their property and approval for the reintroduction of a subject species’ adjacent to their property.
13. Until such time as there is documented proof of the effectiveness of reintroduction toward the recovery of subject listed and candidate species, the NCWRC will not consider reintroduction of listed or candidate species as mitigation for impacts to other extant populations of the species.

Example of a potential reintroduction project

- The robust redhorse (*Moxostoma robustum*) is a very rare freshwater fish species with a historic range from the Altamaha River in Georgia to the Pee Dee River in North Carolina. Two populations are presently known, one in the Altamaha River and one in the Savannah River. Evidence of recent reproduction in both populations is very limited.

The NCWRC, along with the Georgia Wildlife Resources Division (GWRD), South Carolina Division of Natural Resources, the USFWS, as well as various conservation groups and universities, is a member of the Robust Redhorse Conservation Committee. One of the goals of this committee is to restore the robust redhorse within its historic range, without implementing the Act.

Captive propagation efforts for the robust redhorse are underway in Georgia, and individuals for stocking purposes are available at five fish hatcheries in Georgia. GWRD is currently stocking robust redhorse in appropriate habitats in Georgia rivers, and the NCWRC could assist with the restoration effort by stocking this species in North Carolina waters with fish propagated at the Georgia hatcheries. Given habitat and food resource considerations, the Little River in Montgomery and Richmond counties appears to be an appropriate area for future stockings of the robust redhorse.