

**Protected Species Impacts & Habitat Management
Associated With Transportation Projects in
North Carolina**

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Abstract. Section 7 (a) (2) of the Endangered Species Act “requires every Federal agency...to insure any action it authorizes, funds, or carries out..., is not likely to jeopardize the continued existence of any listed species or results in the destruction or adverse modification of critical habitat.” The North Carolina Department of Transportation’s (NCDOT) projects are considered federal actions when a federal Environmental Impact Statement (EIS) is required, when the project receives Federal Highway Administration (FHWA) funding, or when a federal permit is required, such as a Clean Water Act Section 404 permit. This paper describes NCDOT’s protocols for addressing and resolving endangered species concerns by examining case studies involving some of the protected animal species with which NCDOT is most frequently involved.

INTRODUCTION

North Carolina has more than 77,000 miles of highway and supports one of the nation’s largest state-maintained systems. In 1989, the North Carolina Highway Trust Fund was established to finance the states’ highway system. The trust fund receives money from motor fuel and highway use taxes, vehicle title fees and interest income. Since the establishment of the highway trust fund, the NCDOT has completed 14 Final Environmental Impact Statement documents (FEIS), 66 Environmental Assessments/Finding of No Significant Impact (EA/FONSI) and 454 Categorical Exclusions to comply with The National Environmental Policy Act (NEPA). In addition to the NEPA documentation, seven FEIS and 90 EA/FONSI documents have been completed to satisfy the North Carolina Environmental Policy Act (NCEPA).

With such a high volume of transportation projects initiated throughout the state, some projects are almost certain to have protected species concerns. Currently in North Carolina there are a total of 26 plant and 36 animal species that are protected under the Endangered Species Act (ESA). Several of these species have very restricted habitat requirements, and occur in areas such as high elevation balds or beach dunes, which are not normally impacted by NCDOT activities. There are relatively few protected species that NCDOT encounters on a routine basis.

The procedural regulations governing interagency cooperation (consultation process) under Section 7 were established by a joint rule (50 CFR Part 402 ESA) between the U.S. Fish and Wildlife Service (FWS) and the National Marine Fisheries Service (NMFS) on June 03, 1986. Since this time, NCDOT has completed, or is in the process of completing, 55 consultations with the FWS and three with NMFS. These consultations have involved only 14 of the 62 species listed for North Carolina, with nine species

comprising 93% of the consultations. Twenty-one of the consultations have involved freshwater mussels (five species), nine the Cape Fear shiner (*Notropis mekistocholas*), a freshwater fish endemic to portions of the Cape Fear River drainage basin, and eight the red-cockaded woodpecker (*Picoides borealis*) (RCW). Two plant species, the dwarf-flowered heartleaf (*Hexastylis naniflora*) and Schweinitz's sunflower (*Helianthus schweinitzii*) are also frequently encountered, with six and four consultations involving these species respectively.

Of these 55 consultations, only six projects have required Formal Consultation. Design changes and construction commitments have often been implemented such that a Biological Conclusion of Not Likely to Adversely Affect can be made, thus avoiding Formal Consultation. NCDOT's goal is to resolve concern over potential impacts and to avoid a Formal Consultation scenario.

PROTOCOLS FOR RESOLVING PROTECTED SPECIES CONCERNS

To ensure that the FHWA's obligations are met pursuant to Section 7 of the ESA, the Planning & Environmental Branch of NCDOT (P&E) addresses protected species concerns at two junctures of a project's development. Section 7-related investigations are undertaken as part of routine natural resource studies in support of NEPA documentation (CE, EA/FONSI, EIS), or are conducted to satisfy FHWA Consultation requirements.

NEPA Documentation

The NCDOT Planning Manager for the proposed project requests the Environmental Unit of P&E to initiate natural resources investigation in support of NEPA documentation (CE, EA, or EIS). Studies conducted on behalf of federally-protected species are accomplished during the natural resources investigation. Protocols differ between EIS projects and EA's and CE's, during the initial phase of investigation.

EIS Projects

During project scoping of an EIS, the NCDOT Project Planning Manager formally requests from the FWS, a list of federally-protected species which may potentially occur in the project area. During the Draft EIS study, biologists first check the North Carolina Natural Heritage Program (NHP) database of rare and protected species, to determine if there are any known occurrences of protected species in any of the reasonable and feasible corridors that are being studied. They are then required to inventory the availability and relative abundance of suitable habitat for each federally-protected species occurring on the list provided by FWS, in each of the reasonable and feasible corridors. This investigation takes place during what is known as the Phase II study (Phase I studies focus on preliminary corridors and do not involve federally-protected species issues).

The data obtained from this investigation are used as an "Index of Potential Occurrence" for each federally-protected species in each of the reasonable and feasible corridors.

These data, along with records of known populations, are some of the many factors which ultimately lead to the selection of a preferred corridor. A single exception to this rule is made for the RCW, when the project occurs in the vicinity of a known cluster for this species (Fort Bragg, sandhills, etc.). In these cases, surveys must be conducted within a 0.5 miles (0.75 miles for U.S. Forest Service lands) radius of the project for each of the Reasonable and Feasible Corridors.

During the Final EIS study, the biologist is tasked with conducting an extensive investigation for the presence of federally-protected species in the preferred corridor. The methodologies used at this time are the same as for CE-EA/FONSI studies described below.

CE-EA/FONSI Projects

The FWS periodically sends the Environmental Unit a county-by-county (all inclusive) list of federally-protected species. If a project occurs within a county known to contain a listed species, the project biologist reviews the NHP database of rare and protected species. If no known populations occur within the project area, the biologist then assesses the project area for the presence of suitable habitat for all species listed for that county. With the exception of RCW and aquatic species studies, which will be discussed later, the project study area is defined as the area bounded by the proposed right-of-way (ROW).

If habitat suitable for the target species is not present, a Biological Conclusion of "No Effect" is rendered. If suitable habitat for the target species is present, then surveys utilizing current scientifically accepted methodologies are conducted in zones suitable for the species during appropriate seasons, to determine if the listed target species occurs in the project area. If the species is not found, a Biological Conclusion of "No Effect" is given. If the species is found to be present in the project area, an interim conclusion of "Unresolved" is reported until avoidance measures are explored and the certainty of impacts established. The Section 7 Informal Consultation process begins at this time.

Informal Consultation

This process "includes all discussions, correspondence, etc., between the Service (FWS or NMFS) and the federal agency, or designated non-federal agency prior to Formal Consultation if required" (50 CFR, Part 402 ESA). The ESA permits the responsible federal agency to officially designate a non-federal representative to conduct informal consultations (50 CFR, Part 402 ESA). The FHWA officially designated the various state highway or transportation agencies as their non-federal representative on August 7, 1986.

The main purpose of the informal consultation process is to determine if formal consultation is required. Although the presence of the target species in the project area has been established at this point, it may be possible to avoid adverse impacts to the species and/or its critical habitat, and prevent Formal Consultation.

Through correspondence and discussions between the Service and the non-federal representative, measures which would avoid impacts may be adopted. This process often involves a Section 7 Conference (50 CFR Part 404.10 ESA), or meeting, usually at the project site, in which the two parties discuss measures that would avoid impacts to the target species, while maintaining the project purpose. Other agencies, such as the North Carolina Wildlife Resources Commission (WRC), or individuals (recognized experts on the species) may also participate in this meeting. Examples of measures which have been implemented to avoid impacts include design changes, such as reducing impact width to avoid a protected plant population, and delaying construction schedule to avoid bald eagle nesting activity.

If avoidance measures are incorporated into the project design and a Biological Conclusion of Not Likely to Adversely Affect can be rendered (by the non-federal representative) and concurred with by the Service, then Section 7 requirements are completed. If it is determined that the project cannot be completed without impacting the species present (Biological Conclusion of May Adversely Affect), then Formal Consultation is required.

Formal Consultation

Once a Formal Consultation is needed, all coordination to the Service must go through the Federal agency, in this case FHWA. The procedures of Formal Consultation, including correspondence and time tables, are fairly detailed and cannot be covered in the time constraints of this discussion. The process can take up to 135 days, but it is NCDOT's experience that the process usually does not require this entire amount of time. The Formal Consultation process terminates in the issuance of a "Biological Opinion" from the Service, which states the opinion of the Service as to whether or not the federal action is likely to jeopardize the continued existence of the target species, or result in destruction or adverse modification of critical habitat.

When the Formal Consultation is initiated, NCDOT performs a Biological Assessment, which includes a review of literature and other information concerning the target species, as well as analyses of the project impacts and alternative actions. This information, including the Biological Conclusion regarding project impacts to the target species, is sent to the Service through FHWA. The Service then reviews the submitted documentation and issues a Biological Opinion.

The likelihood of jeopardizing the continued existence of a protected species is the issue being addressed. A project may result in impacts to a particular population of a listed species, but if this action is not considered to jeopardize the continued existence of that species, then a "No Jeopardy" Biological Opinion will be issued. Often with a "No Jeopardy" opinion, certain minimization and/or mitigation measures will be required. An example of a minimization measure would be a reduction of the impact area. Mitigation measures have included land acquisition and protection of a particular population of a

listed species, or enhancement/creation of populations. Mitigation measures employed for the RCW will be discussed later.

If a “Jeopardy” opinion is issued by the Service, it requires that the project be revised, or terminated. The Federal agency can then decide to revise the project and reinitiate the consultation process, or proceed with the project, and risk lawsuit. To date, NCDOT has had only one consultation to receive a Jeopardy Opinion.

FHWA-Mandated Consultations

This process is not to be confused with the Section 7 Consultation process, but is initiated if ROW acquisition is scheduled more than 12 months following the NEPA environmental documentation, or if construction letting is scheduled more than 12 months following ROW acquisition (or environmental documentation). The NCDOT project Planning Engineer requests the Environmental Unit of P&E to review and reassess all federally-protected species issues related to the project.

This process serves as a safety net to ensure that Section 7 requirements are met, by answering the questions: 1) Have any species been added to the FWS list for the project county since the NEPA documentation?, and 2) were the previous investigations conducted for NEPA documentation thorough and defensible?

Protocol overview and Bald Eagle Case Study

NCDOT's approach to addressing protected species concerns is a relatively effective and successful method. In only one instance, a bridge replacement near the city of Greensboro, did a problem arise. The NEPA documentation for this project was completed in March of 1992. At this time, no federally-protected species were known to occur in Guilford County, and thus it was concluded that project construction would have no impacts on any listed species. A FHWA-mandated construction consultation was completed in September 1993, which found that no listed species had been added to Guilford County since the NEPA documentation, and thus the Biological Conclusion of No Effect to listed species remained valid. The project was advertised for construction in December of that year, around the same time that a pair of bald eagles (*Haliaeetus leucocephalus*) began nesting (first attempt) in close proximity to the project.

When the construction crews began work in early March 1994, they were notified of the eagles in the area. Through meetings with the FWS, the construction contractor and NCDOT, it was determined that the project should be delayed until after the nesting was complete and the young (if nesting was successful) fledged. It was also decided that because of traffic volume, the road would need to be reopened during the delay. Certain provisions were made in how to reopen the road without creating adverse noise impacts to the nesting pair. These provisions included reinstallation of the removed guardrails by hand tamping rather than using hydraulically powered tools, and supervision by a NCDOT staff biologist to observe the nest at all times during this activity to make sure that at least

one bird was on the nest at all times. The construction crews were informed to halt activity if the birds flushed from the nest. The road was successfully reopened without impacting the nesting activity.

In late June of 1994, the young eaglet was observed to be capable of flight (a provision required before construction), and construction resumed on July 01. Contract specifications were made so that completion of the project would occur before the eagle pair was expected to return to the area and resume nesting (mid-November). Project construction was completed by November 04 and the pair returned and successfully reared another young in 1995. They are currently in their third nesting season at this site.

CASE STUDIES OF NCDOT SECTION 7 CONSULTATIONS

Red-cockaded Woodpecker

The red-cockaded woodpecker (*Picoides borealis*) (RCW) is a small woodpecker endemic to the southeastern United States that was once common in mature pine forests throughout its range. Clearing of these forests (primarily longleaf pine ecosystems), for agricultural and development purposes, has substantially reduced this species' range and abundance. The majority of the remaining populations occur on federal lands such as Fort Bragg in North Carolina and the Sandhills National Wildlife Refuge in South Carolina. An exception to this is the sandhills area of North Carolina, where a large number of colonies still occur on private lands. As stated earlier, NCDOT deviates from its normal EIS protocols for addressing protected species concerns, by surveying for the RCW in each reasonable and feasible corridor when projects are within these known cluster areas of RCW (Sandhills, Fort Bragg).

Widening of US 15-501

In February of 1991, the FWS issued a "Jeopardy Opinion" for the federally-listed RCW, as it related to proposed construction of the US 15-501 highway project in Moore County, North Carolina. Impacts to foraging habitat of the federally-protected red-cockaded woodpecker were anticipated and were expected to jeopardize the continued existence of this species as a result of the proposed project. NCDOT began work on a mitigation plan as a result of a Section 7 consultation. This mitigation plan was determined to be a reasonable and prudent alternative for the proposed project. The plan was developed as a result of a collaborative effort between NCDOT and FWS. Components of this alternative included the creation or rehabilitation of four RCW colony sites on state-owned land at McCain, Hoke County, North Carolina.

The McCain property is located in western Hoke County in the sandhills of southern North Carolina. This state-owned parcel consists of approximately 1,700 acres. McCain is bordered by the Fort Bragg (FB) Military Reservation on the east and private lands on all other sides. Military training, agriculture, forestry, and rural residential housing were the surrounding land uses at the time (Carter 1995).

McCain was a heavily forested tract, and had been managed in recent years primarily for the production of pine straw. There were two extensive stand types on the tract: longleaf pine (*Pinus palustris*)-scrub oak (*Quercus* spp.) and loblolly pine (*Pinus taeda*) plantation. Other community types present at McCain included xeric upland hardwood, streamhead pocosin, beaver pond and a pond cypress (*Taxodium ascendens*)- shrub Carolina bay (Carter 1995).

The historical use of the McCain property by RCWs included five active colony sites in 1981; by 1990 only a single breeding group remained. All other McCain clusters were inactive by 1990 (Carter 1995).

Dr. J.H. Carter III and Associates was contracted to develop and perform the mitigation plan in cooperation with FWS. McCain and one-half mile radius around it were surveyed for RCW cavity trees and colony sites during the summer and fall of 1991. No new colony sites were found, though a few previously unknown cavity trees were located. As a result of the preliminary investigation, four colony sites were chosen for the placement of artificial cavities.

One-half mile radius foraging circles were delineated around the center of each mitigation colony and around all adjacent active colonies. These circles were established to ascertain the levels of foraging habitat associated with the locations of new cluster sites. The methodology of data collection was sufficient to obtain at least several sample points in each of the major stand types. The total pine Basal Area (BA) and total stems > 10 in. diameter at breast height (dbh) for a type were calculated (Carter 1995). A foraging circle must have at least 8490 sq. ft. of pine BA and 6350 pine stems > 10 in. dbh in stands contiguous to the colony site in order to have sufficient foraging habitat (Henry 1989).

RCWs in the McCain area were already color-banded as a result of on-going long-term RCW demographic studies conducted by North Carolina State University. Unbanded adults and nestlings were captured and color-banded during this study as the need arose (Carter 1995).

In October and November of 1991, new cluster locations were supplied with 3 artificial starts and 2 artificial cavities each. One artificial cavity and 2 artificial starts were also placed in the one remaining active site on the McCain tract (Carter 1995).

It was determined that all the foraging habitat associated with the created clusters was adequate. After the adequacy of foraging habitat was determined, approximately 10 acres in and around each of the provisioned colonies was cleared of nearly all understory hardwoods. Following the mechanical clearing of understory hardwoods, during the spring of 1992, the NC Forest Service burned most of these cleared areas, as well as much of the surrounding foraging habitat (Carter 1995).

As early as April of 1992, RCW use of the provisioned areas was evident. To date, all five clusters associated with the McCain Tract are actively being used by RCWs (Carter

1995). The mitigation process described herein has proved highly successful in achieving short-term, local population growth with existing RCW populations. However, it should be noted that in each case, the provisioned site was placed next to existing occupied territories within major RCW populations. This process is not likely to produce similar results in areas with low RCW densities, a highly fragmented population, or no population at all (Carter 1995).

Freshwater Mussels

Of the nearly 70 recognized species of freshwater mussels that occur in North Carolina, 67 % are considered to be in some state of peril, with one species believed extinct and five species currently federally-listed. At least one of these five species is listed by the FWS to occur in 20 of the 100 counties in North Carolina. Some of these mussel species occur in rapidly developing parts of the state such as Charlotte, Raleigh and their surrounding areas. Mussels in general are extremely sensitive to water quality degradation, including point source discharge, sedimentation and stream bank erosion.

Naturally, in areas that are growing quickly, a large number of transportation projects result from this development. Because of the large number of projects that had potential concerns over listed mussel species, a streamlining of our protocols, including the consultation process was attempted. From 1986 to the present, NCDOT has had 21 Section 7 Consultations involving listed mussels, all of which have been handled informally.

Our protocols for determining if a listed mussel will be impacted by a proposed action are similar to the process described earlier, with an additional step. Along with the initial NHP database search, the North Carolina Wildlife Resources Commission (WRC) Proposed Critical Habitats (PCH) for aquatic species is also consulted. The WRC has designated several stretches of North Carolina waters which they believe to be critical for the survival of certain protected aquatic species, and have proposed protective measures for these PCHs. If a project impacts a water body within a PCH for a federally-listed species then it is assumed that there is a potential to impact that species and Informal Consultation is begun.

If a project does not occur near a known population, and is not within a PCH for a listed mussel species, then the normal sequence of assessment is followed. Streams are examined for suitability of habitat, followed by a stream reconnaissance for the presence of mussel fauna, and finally a particular survey for the target species by a licensed person (WRC Endangered Species Collection Permit). If suitable habitat, mussel fauna, or the target species is not present during each of the successive steps, than a conclusion of No Effect is rendered. If the species is found to be present than the Informal Consultation process begins.

Informal Consultation: Aquatic Species

Through discussions with the appropriate agencies, it may be determined that the population occurs far enough away from the proposed action that with appropriate sedimentation control, a Biological Conclusion of Not Likely to Adversely Affect would be warranted and Section 7 requirements satisfied. In many cases, however, a site meeting and other special provisions, which are developed during the meeting, are required. Two projects involving freshwater mussels that have had consultations are examined here. In both cases, a series of Environmental Commitments that avoided impacts to the populations were adopted by NCDOT and Formal Consultation was avoided.

Bridge Replacement Over Crooked Creek, Franklin County

This project involved a bridge replacement over Crooked Creek, in Franklin County, North Carolina. The NEPA level of documentation needed for this and most bridge projects was a CE. The proposed action was to replace the bridge on SR 1001 over Crooked Creek with a new structure on existing location with road closure. Traffic was to be detoured on secondary roads. Crooked Creek is a small perennial stream, approximately 15 feet wide and 2 feet deep at the crossing. Bridge length is 70 feet. No unusual conditions, such as poor alignment or high accident history were associated with the project.

During the natural resources investigation for the required documentation (CE), it was determined that because Crooked Creek was a PCH for the Endangered dwarf-wedge mussel (*Alasmidonta heterodon*) (DWM), the potential for impacting this species existed, thus necessitating Section 7 Consultation. A Biological Conclusion of "Unresolved" was issued at this time.

The DWM is a small mussel which formerly ranged from the Petitcodiac River in New Brunswick, Canada, south to the Neuse River, North Carolina. Recent surveys failed to locate this species in 16 of the river system for which it was previously recorded. Currently, the DWM is known only from portions of the Connecticut, Potomac, Choptank, Tar and Neuse River systems. The DWM was listed as Endangered in March of 1990. The population in Crooked Creek is considered one of the most viable in the state.

A meeting took place at the bridge site to discuss Section 7 concerns. Representatives from the FWS, NCWRC, FHWA and various branches of NCDOT, including Bridge Construction, Roadway Design, Hydraulics, Roadside Environmental and Planning & Environmental, were in attendance. Various concerns with the construction activity and the DWM were discussed. Recent surveys had found individuals in close proximity to the bridge upstream and downstream, and thus any "in-stream" activity could result in direct "take" of individuals of this population. The other major concern discussed was project-related sedimentation.

The goal of this meeting was to develop and agree upon particular provisions that NCDOT would adopt during the construction of the project, that would eliminate the potential impacts to this population and avoid a Formal Consultation. These provisions are then included as "Environmental Commitments" in the CE report and specified in the construction contract.

Some of the Environmental Commitments have become standard provisions applied to all projects impacting streams within a PCH, or known to contain a listed aquatic species. These include the use of High Quality Waters (HQW) erosion control measures during project construction and a written notification of the construction onset date from the project contractor sent to the FWS, WRC and the P&E Branch Environmental Unit. This allows for those parties to have the opportunity to visit the construction site unannounced to see that the Environmental Commitments have been properly implemented, and to assess if the activity is resulting in any noticeable impacts to the stream quality.

During the meeting some very innovative ideas were brought forth. It was determined that the creek could be spanned entirely, and that in-stream work could be avoided. During demolition of the existing bridge, the timber piles would be cut off at stream level using a crane and bucket to lower one construction worker down to stream level to cut the piles. The piles would then be lifted out and not allowed to fall into the stream. Other provisions were made to keep debris from construction and demolition out of the stream. The bridge was also designed so that drainage outlets were located only on approach spans and not directly above the stream. A rip-rap filter system was designed to catch the run-off from the outlets.

After the meeting, a Biological Conclusion of Not Likely to Adversely Affect was given by the P&E biologist, contingent upon the adoption and implementation of several Environmental Commitments, some of which were highlighted above. The FWS concurred with this conclusion and Section 7 obligations were satisfied. This is a case where a likely Formal Consultation was avoided by staying out of the stream.

Bridge Replacement Over Goose Creek, Union County

This project involves replacing the existing 120-foot long bridge over Goose Creek, in Union County, near the Charlotte metropolitan area. The existing bridge is located at the end of a 22 degree curve, with a tangent alignment on either side of the curve. The roadway is not posted, so the assumed speed limit is 55 mph. There is a history of accidents at this bridge, so the proposed alternate is to straighten the curve and replace the structure on new location upstream of the existing bridge. Goose Creek is a PCH for the Endangered Carolina heelsplitter (*Lasmigona decorata*).

The Carolina heelsplitter is a medium sized mussel that was historically known from several locations within the Catawba and Pee Dee River systems in North Carolina and the Saluda and Pee Dee River systems in South Carolina. The species is currently known to be surviving only in short reaches of four streams, two of which, Waxhaw Creek and

Goose Creek occur in Union County, North Carolina. Impoundments and deterioration of water quality have been recognized as the major sources of this species' decline. The population in Goose Creek is the more viable of the two in North Carolina and is considered to be critical to the species' survival.

An on-site meeting similar to the one described earlier was held. The consulting firm that handled the design and NEPA documentation was also involved. The concern over the Carolina heelsplitter was raised late in the planning process and a final design for the preferred (new location) alignment had already been completed. Goose Creek is too large to span entirely, and the location of the proposed new alignment was directly over substrate where the species had been collected earlier. It was suggested that if the preferred alignment was to be constructed, direct "take" would result and Formal Consultation be required. Also, given the limited number of existing populations, it was highly likely that a "Jeopardy" opinion would be issued.

It was finally decided that the bridge could be replaced essentially in the existing location with a design exception for the design speed. The recommended design speed was reduced from 55 mph to 40 mph, the minimum allowed for this type of roadway. Advisory postings were required at both approaches. This alternate avoided the known mussel bed upstream. Traffic needed to be rerouted by secondary roads.

It was determined that if this alternate (existing location) were constructed and special provisions to eliminate sedimentation and streambank erosion during construction and demolition were also developed to avoid impacts to downstream beds, a Biological Conclusion of Not Likely to Adversely Impact would apply. NCDOT considered this option against the new location option, which may have resulted in a "Jeopardy" opinion, and decided to go with the existing alignment alternate with the Environmental Commitments. The FWS concurred with the Not Likely to Adversely Affect conclusion, and Section 7 responsibilities were satisfied.

Overview: Aquatic Species Protocol

One of the original goals in developing a protocol for Section 7 concerns with aquatic species was to develop a standard set of Environmental Commitments to be used for all projects with these issues, thus bypassing the site meeting. It was apparent early on that, due to variable factors and conditions between projects, this was not possible. Some things that were possible at one project, such as spanning the entire stream, may not be possible at another site. Although site meetings are still necessary for the majority of these cases, everyone involved now knows what to expect, and tries to achieve a common goal of building the project without adversely impacting the protected species.

CONCLUSION

The NCDOT's management of protected species issues has been successful in avoiding project delays. Early coordination is crucial to the success of this process by eliminating

delays and unanticipated expenses. It was unfortunate that the consulting firm mentioned in the Goose Creek Case study had spent so much time and effort on a final design that was never chosen. This example highlights the need to address and resolve protected species concerns early in the planning stages of a project.

The perception that protected species issues create an adversarial climate between the Service and NCDOT has proven untrue. It is extremely important to develop a good working relationship with the Service (FWS, NMFS). Early coordination between the agencies facilitates the meeting of project schedules and reduces the likelihood of unanticipated expenses. By working towards a common goal, most projects can be completed on-schedule without jeopardizing any listed species.

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