Attachment 11:

Programmatic Conference Opinion for Tri-Colored Bat in NCDOT Division 1-8, November 20, 2023

Programmatic Conference Opinion

NCDOT Program Effects on the Tricolored Bat in Divisions 1-8

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TABLE OF CONTENTS

CONFERENCE HISTORY

This section lists key events and correspondence during the course of this conference. A complete administrative record of this conference is on file with the Service's Raleigh Field Office.

2022-09-26 – The Service begins email and telephone discussions with the North Carolina Department of Transportation (NCDOT), Federal Highway Administration (FHWA), and US Army Corps of Engineers (USACE) about the need to conduct programmatic Section 7 conferencing for the tricolored bat.

2023-02-07 – The Service, NCDOT, FHWA, USACE and North Carolina Wildlife Resources Commission met to discuss development of a Programmatic Biological Assessment (PBA).

2023-05-19 – The Service received a rough draft PBA from NCDOT.

2023-05-22 – The Service provided comments on the rough draft PBA.

2023-06-13 – The Service received a revised draft PBA.

2023-09-08 – The Service received the final PBA (dated 2023-08-00) and a letter (dated 2023-09-05) from the FHWA and USACE requesting formal Section 7 conference.

2023-09-13 – The Service provided a letter to FHWA and USACE stating that all information required for initiation of formal conference was either included with their 2023-09-05 letter or was otherwise available.

2023-09-25 – The Service provided the FHWA, USACE, and NCDOT with a draft Programmatic Conference Opinion (PCO).

PROGRAMMATIC CONFERENCE OPINION

1. INTRODUCTION

A Biological Opinion (BO) is the document that states the findings of the U.S. Fish and Wildlife Service (Service) required under Section 7 of the Endangered Species Act of 1973, as amended (ESA), as to whether a federal action is likely to:

- jeopardize the continued existence of species listed as endangered or threatened; or
- result in the destruction or adverse modification of designated critical habitat.

A Conference Opinion (CO) is equivalent to a BO but addresses species that are not yet listed under the ESA and/or proposed critical habitats not yet designated. Therefore, the ESA prohibitions against jeopardizing species, destroying critical habitat, and taking animals do not yet apply. The Service may adopt a CO as a BO if and when the evaluated species/critical habitat are listed/designated and while the action agency's discretion and involvement in the action continue. A Programmatic Conference Opinion (PCO) addresses multiple actions on a program and/or regional basis, thus achieving efficiencies in the process.

The federal actions addressed in this PCO are all North Carolina Department of Transportation (NCDOT) activities within NCDOT Divisions 1-8 (eastern North Carolina) with a federal nexus for an approximate 5-year time frame from now through December 31, 2028. For individual projects that are federally funded, the Federal Highway Administration (FHWA) serves as the lead federal action agency. For individual projects that are not federally funded, the U.S. Army Corps of Engineers (USACE) generally serves as the lead federal action agency when a Clean Water Act Section 404 permit is required. For the purposes of this PCO, these individual projects shall be collectively referred to as the Action. The FHWA and USACE have jointly initiated formal ESA Section 7 conference. This PCO considers the effects of the tricolored bat (TCB) only. All other species must be evaluated independently. The Action does not affect designated critical habitat; therefore, this PCO does not address critical habitat.

It is understood that this programmatic agreement, along with the adherence of all conservation measures as well as quarterly spreadsheet reports to the USACE (describing all non-notifying Nationwide Permits completed during the previous quarter) would satisfy the requirement for a Pre-Construction Notification to the USACE District Commander as required by the ESA General Permit Conditions. Other requirements triggering a Pre-Construction Notification remain valid as stated within each Nationwide Permit. Also, after coordinating with the lead federal agency, NCDOT retains the option to opt out of the PCO/PBO for any individual project with the understanding that Section 7 consultation will be conducted separately for that project.

PCO Analytical Framework

A PCO/PBO that concludes a proposed federal action is *not* likely to *jeopardize the continued existence* of listed species and is *not* likely to result in the *destruction or adverse modification* of critical habitat fulfills the federal agency's responsibilities under §7(a)(2) of the ESA.

> *"Jeopardize the continued existence* means to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the

survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species" (50 CFR §402.02).
"*Destruction or adverse modification* means a direct or indirect alteration that appreciably diminishes the value of critical habitat as a whole for the conservation of a listed species" (50 CFR §402.02).

The Service determines in a PCO/PBO whether we expect an action to satisfy these definitions using the best available relevant data in the following analytical framework (see 50 CFR §402.02 for the regulatory definitions of *action, action area, environmental baseline, effects of the action*, and *cumulative effects*).

a. *Proposed Action*. Review the proposed federal action and describe the environmental changes its implementation would cause, which defines the action area.
b. *Status*. Review and describe the current range-wide status of the species or critical habitat.
c. *Environmental Baseline*. Describe the condition of the species or critical habitat in the action area, without the consequences to the listed species caused by the proposed action. The environmental baseline includes the past and present impacts of all federal, state, or private actions and other human activities in the action area, the anticipated impacts of all proposed federal projects in the action area that have already undergone formal or early consultation, and the impacts of state or private actions which are contemporaneous with the conference/consultation.
d. *Effects of the Action*. Predict all consequences to species or critical habitat caused by the proposed action, including the consequences of other activities caused by the proposed action, which are reasonably certain to occur. Activities caused by the proposed action would not occur but for the proposed action. Effects of the action may occur later in time and may include consequences that occur outside the action area.
e. *Cumulative Effects*. Predict all consequences to listed species or critical habitat caused by future non-federal activities that are reasonably certain to occur within the action area.
f. *Conclusion*. Add the effects of the action and cumulative effects to the environmental baseline, and in light of the status of the species, formulate the Service's opinion as to whether the action is likely to jeopardize species or adversely modify critical habitat.

2. PROPOSED ACTION

North Carolina is one of only a few states that have no county highway departments. With about 80,000 miles of state-owned and maintained highways, NCDOT has the second largest state-owned and maintained highway system in the country (FHWA 2021). NCDOT constructs and maintains a wide variety of transportation infrastructure across the state, including aviation, bicycle, pedestrian, ferry, highway, public transportation, and railroad projects. NCDOT has divided the state into 14 geographical divisions. Typically, larger projects are planned as part of the Statewide Transportation Improvement Program (STIP), while smaller projects are planned within the local Division Office. Most state transportation projects eventually become the responsibility of the local NCDOT Division Offices to maintain.

NCDOT projects are tracked by project type and a unique number. NCDOT STIP and Division project types, including commonly used prefixes, are listed below (Table 2) with brief descriptions adapted from the STIP (NCDOT 2023).

Table 2. NCDOT STIP and Division Project Types and Descriptions

Prefix	Project Type	Description
B	Bridge Replacement in STIP	Existing bridges are replaced. These projects are generally larger or more complicated than the next two categories.
BD	Bridge Replacement in Division	Existing bridges are replaced. Generally these are two lane bridges.
BP	Bridge Preservation in Division	Existing bridges are preserved by supplementing or replacing compromising elements.
C	Congestion Mitigation	Addition of lanes, sidewalks, greenways, trails, intersections, and associated crosswalks and signage for improved movement
E	Enhancement	Installation of interactive signage, visitor's exhibits, gateway and/or interruptive markers intended for scenic beautification
EE	Mitigation	Wetland and stream mitigation as enhancement, restoration, or preservation conducted to offset losses due to project construction
EB, ER	Bike Route and Pedestrian Enhancement	New or additional lanes for bike or pedestrian traffic
EL	Enhancements – Multi-use Path	Ramp, parking lot, or visitor center improvements, preservation, or maintenance
F	Ferry	Dock, ramp, engine, ferry, parking lot, or visitor center improvements, preservation, or maintenance
FS	Feasibility Study	Conducted to determine the degree to which the project is justified (economically, environmentally, socially, financially)
I	Interstate	Pavement preservation or maintenance, access improvement, widening, upgrading intersections, bridge preservation and/or adding lanes along interstates
K	Rest Area	Existing or new rest area ramp, parking, sewer, fixtures and finishes installation or preservation
L	Landscape	Plantings along NCDOT projects
P	Passenger Rail	Rail grade separations, track realignment, track improvement, track and station right of way acquisition, and track bypass installation
R, A, M	Rural	Improvements to existing and new locations, road widening, intersection or interchange improvements, traffic circles, and weigh stations improvements
S, SB	Scenic Byway	Waysides, overlooks, interpretive signs, land conservation to implement resource protection and heritage tourism development to enhance and preserve scenic vistas and tourism corridors
SF, SI, W	Highway Safety and Hazard	Realign curves, install median barriers, install shoulders or turn lanes to improve safety

Prefix	Project Type	Description
SR	Safe Routes to School	Improve safety and/or reduce traffic, fuel consumption, and air pollution in vicinity of schools; also includes education, training, and other non-infrastructure needs
U	Urban	Roadway improvements including new lanes, new location extensions, bridge replacements, grade separations, interchange and intersection conversion
X	Special Projects	New location and new structures
Y, Z	Railroad-Highway Crossings	Grade separation and crossing safety improvements

The proposed programmatic action evaluated in this PCO includes all NCDOT activities in NCDOT Divisions 1-8 (Figure 1) with a federal nexus for an approximate 5-year time frame from now through December 31, 2028.

2.1. Programmatic Activities

For the purposes of this programmatic conference, NCDOT projects (STIP and Division) are grouped into the following categories: 1) new construction, 2) safety and mobility improvement, 3) maintenance and preservation, 4) disaster response, bank stabilization, and sinkhole repair, 5) transportation enhancements, and 6) stream and wetland mitigation. Each of the above categories of projects is further divided into a list of potential activities and sub-activities. Any individual project may involve a combination of one or more activities or sub-activities.

2.1.1. New Construction (category)

New construction includes activities for roadway and railway construction and improvements, bridge and culvert construction and replacement, and the development of construction staging areas. Heavy equipment use is involved in all aspects of new construction. New construction projects typically reduce and modify habitat, increase impervious surface area, and increase disturbance. Many of these projects affect undeveloped or undisturbed property, require the acquisition of additional right-of-way (ROW), and involve impacts to native vegetation. Contractors may need to establish project equipment staging areas and parking areas, but existing road surfaces or parking areas can often be utilized.

Staging areas/site prep (activity)
This activity covers preparations at the project site and staging areas. Staging areas are places where equipment, a temporary field office, and materials are temporarily stored or located in preparation for their use during construction. These areas are typically located within or closely adjacent to the construction site.

- Lighting - The use of lighting to illuminate project work involves installing permanent highway illumination and traffic signals. Lighting may also be used temporarily in order to conduct construction activities during the evening and nighttime hours.
- Tree clearing and grubbing - Tree clearing and clearing of other vegetation is performed to prepare the project area for construction activities. Clearing generally takes place within pre-marked areas in the project area necessary for construction purposes. The

initial access into work areas for clearing activities will be via existing public roads but clearing for temporary access roads may also be needed. Clearing consists of cutting and removing above-ground vegetation such as grass, brush, and trees; removing downed timber and other vegetative debris; and salvaging marketable timber. Grubbing will follow clearing operations to remove any remaining surface vegetation and buried debris. Clearing and grubbing are required prior to earthwork in order to remove vegetative and other debris from work areas so that design specifications (e.g. for compaction) can be met. Trees, stumps, and large roots will be removed from excavation areas to a depth sufficient to prevent such objectionable material from becoming mixed with the material being incorporated in the embankment. All extraneous matter will be removed and disposed of in designated waste areas on or off-site by chipping, burying, or other methods of disposal, including burning. Various methods and equipment will be used for this work. Clearing and grubbing takes place within construction limits but may also occur in temporary construction easements used to assemble and store the construction vehicles that are too large to travel on the highway in one piece (e.g. haul trucks, earthmovers, large dozers, large excavators, hoes, etc.). These areas are also used to store supplies (erosion control materials, steel rebar and mesh, small diameter culverts, traffic signs and posts, office trailers, etc.).

- Earthwork - Earthwork is all earth moving activities that will occur for road and interchange construction, access road construction/relocation, utility placement and relocation, construction of drainage structures, and preparation of staging, maintenance, waste, and borrow areas. Earthmoving activities will include excavating (cutting), filling, ditching, backfilling, grading, embankment construction, auguring, disking, ripping, grading, leveling, borrowing and wasting of materials, and any other earth-moving work required in the construction of the project. Earthmoving equipment to be used includes haul trucks, dozers, excavators, scrapers, and backhoes. Earthwork may be conducted as part of the preparation of staging areas, bridge approaches, alignments, embankments, fills, backfills, foundations, toe trenches, road grades, utility relocation, stormwater treatment, ditch construction, bank stabilization, landscaping, restoration, and mitigation.
- Blasting - Blasting may be required on a very limited number of projects. Timing and duration of the blasting will vary on a project-by-project basis. Blasting consists of excavating in rock to achieve smooth, unfractured backslopes. It can also involve blasting to facilitate excavation. Bridgework may require blasting during the construction or removal of bridge abutments. Debris or rock disposal may be required after blasting.
- Dust control - Performing earthwork activities may necessitate the use of dust control measures. This work consists of applying water for the alleviation or prevention of dust nuisance originating from earthwork construction operation from within the project construction limits.
- Install erosion and sediment control best management practices (BMPs) - This work includes the installation of silt fences, check dams, sediment basins, coir blankets and temporary seeding.
- Structure demolition - Structures within the project ROW will be purchased and either demolished or moved (intact) off-site prior to the commencement of construction work. Structures include commercial, residential, and public buildings and facilities. After demolition, structure debris is hauled off-site for disposal.

- Installation of drainage features - This work may include work area isolation, stream diversion, dewatering, excavation for pipe trenches, ditch creation and stream relocation, culvert jacking or drilling, laying and covering pipe, constructing headwalls on the outlet side of flow diversion, installing armoring, and restoring flow.
- Utility relocation - Utility relocation or placement can involve both above and below-ground work, including tree clearing, mowing, trenching, and horizontal or directional boring. When water, sewer, electric, or gas lines need to be relocated, these impacts are typically accounted for during project planning and permitting. In the rare event that utility lines would need to be relocated outside a project ROW, the utility company will be responsible for obtaining their own permits.
- Portable fence installation/removal
- Temporary access road construction – requires installation of geo-fabric and rock
- Gravel workspace

Offsite use areas (activity)
Waste and borrow areas that are used to dispose of and obtain materials for earthwork are also subject to clearing and grubbing, but the contractor is responsible for addressing federally listed threatened and endangered species issues per NCDOT standard specifications. Most borrow and waste areas are sited in areas of previously disturbed habitat where tree removal is minimal.

Road surface preparation and construction (activity)
The activity of road surface preparation and construction also includes the construction of bicycle and pedestrian facilities.

- Construct stormwater facilities
- Final grading and road/trail bed preparation
- Construct barrier wall and retaining wall (mechanically stabilized earth, soil nail, sheet pile, soldier pile, etc.)
- Application of course aggregate, concrete, or asphalt
- Striping, pavement markers, and signage
- Guard rail installation
- Noise wall construction
- Sidewalk installation

New rail track construction (activity)

- Subgrade installation (building up ballast/rail bed)
- Laying track

Bridge/culvert construction (activity)
Work included in this activity includes bridge construction and replacement, construction and replacement of culverts over three feet in diameter and widening of existing bridges and culverts. Many traditional bridge replacement projects take as little as 9 months, and low-impact bridges can be completed in as little as 3-6 months. Culvert replacements are typically shorter in duration. Installation of new bridges may require the installation of an on-site detour bridge. Occasionally, half of the new bridge is constructed adjacent to the old bridge and acts as the detour bridge while the original bridge is removed and replaced.

Geotechnical investigations (drilling) are necessary for any type of construction work that requires a level of underground stability. They are normally needed to determine appropriate designs for bridge foundations. Foundations are required elements of every bridge construction and replacement project. Bridge foundations consist of three general types: 1) drilled shafts, 2) columns on spread footings, and 3) driven piles and pile-supported caps or walls. Driven piles are normally used to support temporary structures such as detour bridges and work bridges. However, driven piles are also used to provide additional support to spread footings.

In-water work may take place during many activities associated with bridge construction, excluding superstructure construction. BMPs are used to protect water quality during in-water work, and special BMPs apply in High Quality Waters, Outstanding Resource Waters, and in N.C. Coastal Area Management Act counties (NCDOT 2003, 2014, 2015).

- Barge use - anchor spud installation, mooring, operation
- Temporary work trestle/platform/detour bridge/causeway construction and removal
    - impact/vibratory pile driving
    - deck installation
    - pile removal (vibratory hammer, direct pull, etc.)
- Bridge demolition (for replacement)
    - work area isolation (cofferdam installation, impact/vibratory pile driving, dewatering)
    - remove piles, footings, piers, bridge decking, rail bed, etc. (vibratory pile driver, clamshell bucket, containment boom)
    - wire saw concrete cutting, crane use
    - hoe ram use, debris containment, excavation
- Substructure construction (piers, shafts, shaft caps, footings, abutments, foundations)
    - work area isolation (cofferdam installation, impact/vibratory pile driving, dewatering)
    - drilled shaft construction (auger drills hole within casing) or impact pile driving
    - install casing and rebar
    - pour concrete
    - spread footing construction
    - riprap installation
- Superstructure construction
    - pier tables, cantilevers, decking, pre-cast concrete or steel girders, crane use

Wildlife Passage Facilities (activity)

The construction of wildlife crossings (including culverts, bridge underpasses, bridge overpasses) involves some level of vegetation alteration and earth work.

- Prepare project site
- Install drainage features
- Construct crossing – culvert or bridge construction
    - retaining walls
    - final grading
    - post construction work

Post-construction (activity)
In addition to temporary BMPs used during construction, NCDOT implements a post-construction stormwater program in accordance with its National Pollutant Discharge Elimination System (NPDES) permit. Post-construction structural BMPs are permanent controls that treat stormwater runoff from stabilized drainage areas to protect water quality, reduce pollutant loading, and minimize post-construction impacts to water quality. Because post-construction BMPs are permanent, they require a long-term maintenance commitment to function as designed.

- Temporary BMP removal (silt fencing, check dams, sediment basin)
- Fence installation
- Landscaping, beautification, site stabilization

Billboards (activity)
NCDOT has entered into an agreement with the FHWA regarding the control of outdoor advertising in areas adjacent to any highway which is or becomes a part of the National Highway System. No person shall erect and/or maintain any outdoor advertising within 660 feet of the highway ROW without first obtaining a permit from NCDOT. Constructing or maintaining a billboard may involve tree removal along highways. Vegetation cutting, thinning, pruning, or removal by billboard owners cannot be conducted without a permit by NCDOT. Billboards may also involve long-term lighting.

2.1.2. Safety and Mobility Improvement (category)

Safety and mobility improvement projects include many of the same activities and sub-activities described under the New Construction category such as tree clearing and grubbing. Heavy equipment use will be required for all projects, and portable lighting may be used for some.

Safety projects are designed to improve the safety of the highway system and not to add capacity. These include signal and illumination improvements, sign installation, installation of sidewalks, tree removal from the clear zone, guard rail installation, railroad grade separation, and alignment modifications. Alignment modifications may include adding auxiliary lanes (e.g. truck climbing and acceleration lanes), channelization (turn lanes), on and off ramp extensions, or realigning an intersection to improve the sight distance.

Mobility improvement projects are designed to improve traffic operations and/or capacity on existing roadways. Typical projects include construction of high occupancy vehicle (HOV) lanes in urban areas; reconstructing existing interchanges; construction of new interchanges; adding additional lanes; and sidewalk, curb and shoulder construction. Overpass, bridge, and culvert replacement and widening may occur as part of a mobility improvement project. Most mobility improvement projects occur in heavily developed urban areas. Many of these projects affect very little undeveloped or undisturbed property, and many occur in the existing ROW in heavily urbanized areas.

Intelligent transportation systems (activity)
Intelligent transportation systems are advanced applications that strive to provide innovative services relating to different modes of transport and traffic management and enable various users

to be better informed and make safer, more coordinated, and smarter use of transport networks. This includes all modes of transport and incorporates current and evolving computer and communication technologies with the goal of improving traffic conditions, minimizing delays, and increasing safety for all commuters. Sub-activities include sign and camera installations.

Railroad protective device installation (activity)
This activity involves the installation of signals and other safety features where railroads intersect at grade or where railroads intersect roads at grade.

Railroad grade separation (activity)
Railroad grade separation involves the alignment of two or more surfaces, associated with similar or dissimilar transport types of differing elevations. This typically consists of the creation of an overpass or underpass to allow for continued flow of activity at the axis/intersection of the transport facilities.

- Staging areas
- Project site prep
- Install drainage features
- Utility lines
- Pre-watering of roads and exposed areas at construction site for dust control or grading

Road surface, railroad bed preparation and construction (activity)

- Construct stormwater facilities
- Final grading and road/rail bed preparation
- Retaining wall construction
- Coarse aggregate application, concrete or asphalt application
- Striping, pavement markers and signage
- Railroad crossing gate installation
- Guard rail installation
- Sidewalk, curb, and shoulder construction

Signal system improvements (activity)
Signal system improvements involve changes or upgrades to signaling system.

2.1.3. Maintenance and Preservation (category)

Many activities under this category will require the use of heavy equipment and portable lighting. Minor tree clearing and grubbing may be required on some maintenance, preservation, and facilities preservation projects.

Bridge painting (activity)
Steel bridges or bridges with steel sections require painting on an as-needed basis, approximately every 10 years.

- Construct scaffolding
- Install full containment (includes vacuum system for capturing wash water)
- Pressure wash bridge
- Sandblast bridge

- Prime/paint bridge
- Remove containment and scaffolding

Bridge rehabilitation (activity)
Bridge deck repairs occur regularly while bridge deck replacement is infrequent. Bridge decks made of concrete are partially removed and replaced. Removal may involve jackhammers, concrete saws, and hydro milling (high-pressure water). Longer bridges have expansion joints that must be repaired and replaced as needed. Bridge repair, painting, and retrofit projects may involve hanging scaffolding and containment devices under and around the bridges.

Bridge repair and maintenance activities include washing, sandblasting, patching, bonding, and filling voids in concrete with epoxy. Similar washing, sandblasting, and patching may be implemented for maintenance of guardrails and other infrastructure. In addition, this activity may occasionally include minor replacement and repair of bridge structural elements, such as individual trusses, stringers, and girders. Generally, this work requires the use of light equipment, primarily handheld power tools. However, replacement or repair of bridge structure elements, such as individual trusses, stringers, and girders may require the use of heavy equipment. In-water work similar to that previously described under bridge/culvert construction may take place during many activities associated with bridge rehabilitation projects.

- Install scaffolding and containment
- Replace rivets, degraded steel, bridge railing, joint seals, bearing work
- Seal cracks (Shotcrete)
- Repair concrete spalling
- Repair bridge approaches
- Repair/replace electrical system
- Bridge deck replacement
- Bridge demolition
    - install scaffolding and containment
    - mill, break up, or use hydro-demolition to remove existing deck
    - use vacuum truck or sweeper to remove debris
    - repair/replace finger joints
    - pour new deck
    - remove containment and scaffolding

Culvert cleaning/repair (activity)
This activity includes regular removal of debris, vegetation, and sediment.

- Divert flow, dewater as previously described
- Clean culvert
- Install culvert liner (complete or invert)
- Patch repair (metal or concrete, coat and seal)
- Headwall or outfall repair (concrete work or riprap installation)
- Repair joints (band installation, inject grout)
- Line with Shotcrete or Gunnite
- Sandblast/repaint/recoat

Drainage improvements (activity)
This activity includes all work necessary to maintain roadside ditches and channels, cross culverts, catch basins and inlets, and detention/retention basins. Slope and ditch repair involves re-grading ditches and slopes to the appropriate contour and filling in or repairing sides of the ditches where necessary. Regular maintenance of roadside ditches is required to remove built up sediments, debris or blockages, re-slope the sides, and maintain capacity. Removal of newly constructed beaver dams is often necessary when the dams affect the effectiveness of storm drainage facilities. Each construction project has an associated staging area which contains the construction company job site headquarters, parking, equipment, materials storage, refueling tanks, etc.

Catch basins, inlets and retention facilities are part of the storm drain system of the highway. These are designed to trap sediments and liquids and require regular cleaning. Material is removed by manual clearing methods or by using a vacuum truck. Solids are stored on NCDOT property, tested, and then disposed of at an approved disposal facility or recycled as fill material if suitable. Regular cleaning improves water quality and minimizes sediments that enter the natural stream systems.

- Clean and reshape ditches (remove vegetation, sediment, debris)
- Culvert repair work
- Clean catch basins/inlets (manually or vacuum truck)
- Remove beaver dams from culvert ends
- Remove sediment from retention/detention facilities
- Dispose of debris and vegetation

Guardrail replacement (activity)
Guardrail replacement includes the following subactivities:

- remove damaged guardrail
- install posts with post driver
- install steel beam

Pavement rehab and resurfacing (activity)
This activity involves patching, repairing, and replacing of roadway surfaces and pavements. Each section of highway paved with asphalt or concrete must be repaved every 10 – 14 years. If the pavement is in good shape, it may be overlaid with a new layer of asphalt, but badly deteriorated pavement requires the replacement of the foundation material. Typically, the existing asphalt pavement is ground off and replaced or simply overlaid with new asphalt. Ground-up pavement is normally recycled and used to make new asphalt pavement.

Since paving may result in a slightly higher road surface, manholes, drainage inlets, valves, guardrails, and survey monuments may require raising. Ditches and slopes may be repaired, and culverts may be cleaned. Culverts may also require extension as part of pavement rehab and resurfacing projects.

- Seal cracks with liquid asphalt
- Blanket application of liquid asphalt
- Apply aggregate
- Finish with power roller

- Grind (mill) existing pavement
- Collect and dispose of pavement grindings/slurry
- Dowel bar placement (if concrete)
- Apply new pavement

Herbicide spraying within ROW (activity)
This activity involves treating roadside vegetation using chemical control treatment methods that are applied by hand or by vehicle-mounted sprayers. Herbicide is used to control vegetation where manual or mechanical means would be cost-prohibitive or result in excessive soil disturbance or other resource damage. All herbicides are used according to manufacturer's label direction for rates, concentrations, exposure times, and application methods. Only formulations approved for aquatic-use will be applied in or adjacent to wetlands, lakes, and streams. The use of spot herbicide applications is periodically used to control tree limb growth.

Mowing (activity)
Mowing occurs regularly along roadside shoulders during the growing season and extends less frequently to the back of roadside ditches.

Mechanical branch removal along ROW (activity)
This is regular maintenance targeted at woody vegetation that occurs along the edges of existing transportation corridors. The NCDOT maintains a safety recovery zone of 40 feet from the edge of the travel lane to allow errant vehicles to recover. The use of A-boom mowers has been the routine method of limb removal along the tree line. NCDOT also contracts the use of machinery equipped with a series of high-speed rotary saws on a heavy-duty skidder apparatus which cuts the limbs smoothly as it moves along the ROW. There is no set schedule for addressing limb removal and trimming limbs may wait until there is a complaint or problem. NCDOT also periodically contracts for the removal of a swath of roadside trees to set the woods line back to the original desired safety recovery distance when it has become overgrown over the course of several years. This generally requires the removal of 10 to 20 feet of wooded buffer area.

Hazard tree removal (activity)
This occurs along the edges of existing transportation corridors and involves the removal of individual trees with the potential to fall or drop branches in areas that may cause safety issues.

Repair ROW fence (activity)

Facility rehabilitation (activity)
This activity includes the preservation, maintenance, and construction of new weigh stations, rest areas, rail stations, and maintenance facilities. Rehabilitation of historic buildings and other historic structures may also occur.

- Paving
- Expansion of buildings and parking areas
- Septic upgrades
- Minor vegetation alteration and removal (including trees)
- Installation of erosion and sediment control
- Overlay, paving

- Excavation
- Herbicide application
- Painting/striping/signing
- Rehab historic rail buildings and other non-bridge structures

Reconstruct existing rail (activity):
- Install new rail, concrete ties, and resurface stone ballast
- Pavement resurfacing at crossings and approaches
- Upgrade signals and warning systems

Snow removal/deicers (activity)
Snow removal and deicing is conducted sporadically in eastern North Carolina. Stormwater pollution prevention plans are developed for NCDOT maintenance facilities where deicers are stored and loaded, and where equipment repair is conducted.

Bridge inspections (activity)
This activity involves a detailed review of each bridge's superstructure, deck, supports, railing, and pavement to check the functionality and safety of each bridge. Each bridge is inspected every 24 months on average, but a few older structures may be inspected every 12 months.

Endangered Plant Conservation (activity)
NCDOT periodically conserves habitat to offset effects to federally protected plants through conservation easement or purchase of property. This activity also includes habitat protection and restoration work such as thinning, burning, and non-native invasive species control. Herbicides may be used on non-natives, but only on a very limited basis. All herbicides are applied by hand.

2.1.4. Disaster Response, Bank Stabilization, and Sinkhole Repair (category)

There is no way to accurately predict all the activities that may occur within this category since they are entirely dependent on the extent and type of damage and level of repair that will be needed. Minor tree clearing and grubbing may be required on some disaster response, bank stabilization, and sinkhole repair projects in order to provide access for equipment. Heavy equipment and portable lighting may be used.

Disaster response (activity)
Disasters are usually weather-driven events from flooding, ice-storms, or hurricanes. Disaster response activities involve emergency work to repair and stabilize eroding banks or shoulders on sections of rivers, streams, and the ocean adjacent to existing highways. Emergency repairs to bridges and roadbeds may also be necessary. Temporary bridges may be constructed. High water flows during floods can cause erosion of the bank to the point that the adjacent highway is undermined. Other flood damage can include clogged culverts and deposition of debris along transportation corridors. Immediate repairs normally involve protection or reconstruction of the highway and associated infrastructure such as bridges, culverts, and utilities.
- Debris removal
- Construct temporary access road
- Vegetation removal/disposal

- Grading
- Install/remove temporary erosion control
- Barge use
- Riprap installation
- Road reconstruction (rebuild roadbed, add drainage structures, repave, paint)
- Fill newly created breaches
- Sandbag installation/replacement
- Water removal (pumping water from flooded areas)
- Culvert cleaning/repair

Bank stabilization/flood damage/scour repair - non-emergency (activity)
These activities stem from the result of natural changes in river or stream morphology over time. These activities normally involve protection of the highway and associated infrastructure such as culverts and utilities. Clogged culverts often require cleaning or may need upgraded to a larger size to prevent further flow restrictions. Other repairs involve river training techniques to redirect the thalweg away from the road. These techniques include placing riprap, barbs, drop structures, groins, or large woody debris in the waterway.

- Debris removal
- Construct temporary access road
- Vegetation removal/disposal
- Grading
- Barge use
- Riprap installation
- Willow staking
- In-stream structure installation (weirs, barbs, logjams, etc.)
- Road reconstruction (rebuild roadbed, add drainage structures, repave, paint)
- Retaining wall construction
- Landscaping/site stabilization
- Install/remove temporary erosion control

Sinkhole repair (activity)
Sinkhole repair will involve some level of earthwork and may rarely include tree clearing and grubbing, depending on the extent of damage.

- Excavate and/or flush loose material
- Place non-concrete fill material
- Place concrete fill
- Compact fill
- Restore roadway

2.1.5. Transportation Enhancements (category)

Transportation enhancements can include bicycle and pedestrian facility construction and historic bridge rehabilitation. Other activities include the construction of turnouts, overlooks, historic markers, and viewpoints. Such activities could be similar to new roadway construction; however, these are much smaller in scale with less vegetation removal and disturbance. Minor

tree clearing, grubbing, and earthwork may be required on some transportation enhancement projects. Portable lights and heavy equipment may also be used.

- Permanent lighting installed
- Install/remove portable fence
- Prepare project site
- Install drainage features
- Utility lines
- Pre-watering of roads and exposed areas for dust control or grading
- Road and parking lot surface preparation and construction
- Construct stormwater facilities
- Final grading
- Construct retaining wall (mechanically stabilized earth, soil nail, sheet pile, soldier pile, etc.)
- Coarse aggregate application, concrete or asphalt application
- Striping, pavement markers and signage
- Guard rail installation
- Sidewalk installation
- Information kiosk construction
- Post-construction work

2.1.6. Stream and Wetland Mitigation (category)

Stream and wetland mitigation are construction activities that include restoration of the hydrology, soils, and vegetation to wetland systems; bank stabilization and in-channel habitat restoration of streams; and reforestation of riparian buffers. These combined mitigation actions include habitat enhancement, preservation, and replacement.

2.2. Conservation Measures

Conservation measures are actions which promote the recovery of listed species and are included as an integral part of the proposed action. These actions serve to minimize or compensate for project effects on the species under review.

1) No tree clearing will occur within 150 feet of a known maternity roost tree May 1 – July 15 in order to protect non-volant young. Winter roost trees are not considered maternity roost trees. NCDOT will cross-reference information provided by the Service for locations of maternity roosts.
2) NCDOT will provide $8-10 million for TCB studies over approximately five years. The details and study designs will be jointly developed by the Service and NCDOT after completion of formal Section 7 conference. The studies will address multiple data gaps for the TCB. For example, little is known about TCB fall/winter activities in the eastern part of the state. We do not know where they roost, if and where they migrate, how active they are, and other various information that would help NCDOT minimize effects to TCB. Extensive telemetry work will be utilized to help answer these questions. The NCDOT contracting process will be utilized to contract with environmental consultants to implement the studies.

3) Structure bat surveys will be performed during the Natural Resource Technical Report phase of projects that are to replace a bridge or culvert ≥ 5 feet in diameter. This information will then be recorded in NCDOT's database on bridges and culverts.

2.3. Other Activities Caused by the Action

A PCO evaluates all consequences to species or critical habitat caused by the proposed federal action, including the consequences of other activities caused by the proposed action, that are reasonably certain to occur (see definition of "effects of the action" at 50 CFR §402.02). Additional regulations at 50 CFR §402.17(a) identify factors to consider when determining whether activities caused by the proposed action (but not part of the proposed action) are reasonably certain to occur. These factors include, but are not limited to:

(1) past experiences with activities that have resulted from actions that are similar in scope, nature, and magnitude to the proposed action;
(2) existing plans for the activity; and
(3) any remaining economic, administrative, and legal requirements necessary for the activity to go forward.

In its request for conference, the FHWA and USACE did not describe, and the Service is not aware of, any additional activities caused by the Action that are not included in the previous description of the proposed Action. Therefore, this PCO does not address further the topic of "other activities" caused by the Action.

2.4. Programmatic Action Area

The action area is defined as "all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action" (50 CFR §402.02). Delineating the action area is necessary for the federal action agency to obtain a list of species and critical habitats that may occur in that area, which necessarily precedes any subsequent analyses of the effects of the action to particular species or critical habitats.

It is practical to treat the action area for a proposed federal action as the spatial extent of its direct and indirect "modifications to the land, water, or air" (a key phrase from the definition of "action" at 50 CFR §402.02). Indirect modifications include those caused by other activities that would not occur but for the action under conference. The action area determines any overlap with critical habitat and the physical and biological features therein that we defined as essential to the species' conservation in the designation final rule. For species, the action area establishes the bounds for an analysis of individuals' exposure to action-caused changes, but the subsequent consequences of such exposure to those individuals are not necessarily limited to the action area.

Since this PCO collectively evaluates many individual projects, the action area for this PCO includes all the locations of individual NCDOT activities within NCDOT Divisions 1-8 (Figure 1) and is hereafter referred to as the Programmatic Action Area. The Programmatic Action Area occurs within the easternmost 59 counties of North Carolina, which encompass all the Service's Raleigh Field Office work area. The Programmatic Action Area includes the following three

EPA Level III Ecoregions: Piedmont, Southeastern Plains, and Middle Atlantic Coastal Plain (Griffith et al. 2002).

3. SOURCES OF CUMULATIVE EFFECTS

A PCO must predict the consequences to species caused by future non-federal activities within the Programmatic Action Area, *i.e.,* cumulative effects. "Cumulative effects are those effects of future state or private activities, not involving federal activities, that are reasonably certain to occur within the action area of the federal action subject to consultation" (50 CFR §402.02). Additional regulations at 50 CFR §402.17(a) identify factors to consider when determining whether activities are reasonably certain to occur. These factors include but are not limited to: existing plans for the activity; and any remaining economic, administrative, and legal requirements necessary for the activity to go forward.

If reviewed individually, some NCDOT maintenance activities would not have a federal nexus and thus could qualify as cumulative effects. However, given the programmatic nature of this conference, such maintenance activities are included in the overall project description and assessed on a program level.

Eastern North Carolina has a large timber industry, with approximately $897 million of timber being delivered to mills within the Programmatic Action Area in 2021 alone (Bardon 2023). Much of this timber harvest is part of sustainable management, with the remainder occurring due to development and land clearing for other purposes. From April 2010 to June 2019, the estimated human population within the Programmatic Action Area increased by approximately 535,000 people (U.S. Census Bureau 2023). Increased population growth generally leads to increased land clearing. However, only about 2% of the population increase occurred within rural areas where the TCB is most likely to be present (NCDOT 2019).

4. STATUS OF TRICOLORED BAT

This section summarizes best available data about the biology and condition of the tricolored bat (TCB, *Perimyotis subflavus*) throughout its range that are relevant to formulating an opinion about the Action. The Service published a proposed rule to list the tricolored bat as endangered on September 14, 2022 (87 FR 56381–56393). The TCB Species Status Assessment (SSA) report was published December 2021.

4.1. Species Description

The TCB is one of the smallest bats in eastern North America and is distinguished by its unique tricolored fur that appears dark at the base, lighter in the middle, and dark at the tips. TCB often appear yellowish (varying from pale yellow to nearly orange), but may also appear silvery-gray, chocolate brown, or black. Other distinguishing characteristics include 34 teeth (compared with 38 teeth in eastern North American *Myotis* species), a calcar (i.e., spur of cartilage arising from the inner side of the ankle) with no keel, and only the anterior third of the uropatagium (i.e., the membrane that stretches between the legs) is furred (Barbour and Davis 1969, Hamilton and Whitaker 1979).

4.2. Life History

TCB may live 10-15 years. TCB reproduction begins when males and females converge at cave and mine entrances between mid-August and mid-October to swarm and mate. Females store sperm in their uterus during the winter, and fertilization occurs soon after spring emergence from hibernation. During winter TCB hibernate in caves or mines, although in the southeastern US where caves and mines are sparse, TCBs may winter in culverts, abandoned water wells, and trees cavities (Barbour and Davis 1969, Meierhofer et al. 2019, Newman et al. 2021, Ferrall 2022, Lutsch et al. 2022).

TCB disperse from winter hibernacula to summer roosting habitat in the spring. During this time TCB primarily roost among live and dead leaf clusters of live or recently dead deciduous hardwood trees, Spanish moss (*Tillandsia usneoides*), pine needles, eastern red cedar (*Juniperus virginiana*), or within man-made structures (e.g. bridges).

Female TCB form maternity colonies and switch roost trees regularly. Females typically give birth to two pups between May and July. At three weeks of age the young can fly, and by four weeks they can achieve adult-like flight and foraging abilities. TCB are still considered juveniles when entering their first hibernation, and they are unlikely to mate their first fall.

TCB are opportunistic feeders and typically consume small insects such as caddisflies (Trichoptera), flying moths (Lepidoptera), small beetles (Coleoptera), true bugs (Homoptera), flies (Diptera), small wasps and flying ants (Hymenoptera). While foraging, TCB exhibit a slow, erratic, fluttery flight pattern as they feed at or above treetop level early, then closer to the ground later in the evening. TCB forage most commonly over waterways and forest edges. For additional life history information, see the TCB SSA (USFWS 2021).

4.3. Numbers, Reproduction, and Distribution

TCB are known from 39 States (Alabama, Arkansas, Colorado, Connecticut, Delaware, Florida, Georgia, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Nebraska, New Hampshire, New Jersey, New Mexico, New York, North Carolina, Ohio, Oklahoma, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Vermont, Virginia, Wisconsin, West Virginia, Wyoming), Washington D.C., four Canadian Provinces (Ontario, Quebec, New Brunswick, Nova Scotia), and Guatemala, Honduras, Belize, Nicaragua and Mexico. The species current distribution in New Mexico, Colorado, Wyoming, South Dakota and Texas is the result of westward range expansion in recent decades as well as into the Great Lakes basin. This expansion is largely attributed to increases in trees along rivers and increases in suitable winter roosting sites, such as abandoned mines and other human-made structures.

Winter hibernacula counts provide the most consistent, long-term, reliable trend data and thus can be used to assess TCB current and future viability. Current demographic conditions based on past declines indicate TCB rangewide winter abundance and number of extant winter colonies have declined by 52% and 29%, respectively. The TCB range is organized into three

representation units (RPUs) – northern, eastern, and southern. TCB winter abundance has declined across all RPUs but varies spatially (24–89%). Declining trends in TCB occurrence and abundance is also evident from summer data: 1) TCB rangewide occupancy declined 28% from 2010–2019; 2) mobile acoustic detections decreased 53% from 2009–2019; and 3) summer mist-net captures declined 12% compared to pre-white-nose syndrome capture rates. Based on current conditions, future projections of TCB abundance, number of hibernacula, and spatial extent will continue to decline. For additional information on numbers, reproduction, and distribution, see the TCB SSA (USFWS 2021).

4.4. Conservation Needs and Threats

The predominant threat to and the reason for listing the TCB as federally endangered is white-nose syndrome (WNS, 87 FR 56381-56393), a disease caused by the psychrophilic (cold-adapted) fungus *Pseudogymnoascus destructans* (*Pd*) that is known to kill some species of hibernating bats (USFWS 2023a). WNS impacts physiology, water balance, and arousal patterns of some species of hibernating bats in lethal ways (Cryan et al. 2010, Willis et al. 2011, Reeder et al. 2012). There is currently no known practicable cure. The effect of WNS on TCB has been extreme. Cheng et al. (2021) concluded WNS caused estimated population declines of 90–100% across 59% of TCB range. The spread of WNS is correlated with the distribution of caves and climate (Maher et al. 2012).

Pd grows best at the cool temperatures at which many bats hibernate, with optimal fungal growth occurring at 54.5° to 60.4° F, and no growth above approximately 67° F (Verant et al. 2012). Temperatures in WNS-affected hibernacula seasonally range from 36° to 57° F, permitting year-round growth, and may act as a reservoir maintaining the fungus (Blehert et al. 2009). Langwig et al. (2014) documented that contact with *Pd* contaminated hibernacula in autumn initiated infection in bats, but transmission and infection intensity remained low until bats began to fully hibernate during the winter. In summer, despite high bat-to-bat contact rates, most surviving bats cleared infections and prevalence dropped to zero, presumably due to the resumption of a body temperature higher than the upper growth limit of *Pd*.

Wind energy related mortality has the next highest level of impact (medium impact), with an estimated 3,227 TCB killed annually at wind facilities across their range. Habitat loss and climate change are considered low level threats. For more detailed information on conservation needs and threats, see Chapters 2 and 4 of the TCB SSA (USFWS 2021).

5. ENVIRONMENTAL BASELINE FOR TRICOLORED BAT

This section describes the best available data about the condition of the TCB in the Programmatic Action Area without the consequences caused by the proposed Action.

5.1. Programmatic Action Area Numbers, Reproduction, and Distribution

From 2015 through 2022, 1180 mist net bat surveys were conducted at approximately 518 individual sites within the Programmatic Action Area by staff from the Service, North Carolina Wildlife Resources Commission (NCWRC), and consulting firms. At least 283 unique TCBs

were captured within 38 of the 59 counties within the Programmatic Action Area (USFWS unpublished data). The North Carolina Natural Heritage Program database has additional TCB occurrences prior to 2015 and in additional counties within the Programmatic Action Area (Figure 2). The TCB is assumed to occur in all 59 counties within the Programmatic Action Area, albeit in a patchy distribution.

Occupancy rate (i.e. probability that a species occurs at a random site within suitable habitat) is difficult to calculate. However, the TCB occupancy rate within the Programmatic Action Area can be estimated as follows. A total of 518 sites were surveyed 2015 – 2022, with 1-17 surveys per site but averaging 2.3 surveys per site. Of the 518 sites, TCB were captured at 124 sites (23.9%). The estimated range wide detection probability for TCB mist net surveys is 0.3275 per survey effort (Mike Armstrong, USFWS unpublished data). To calculate detection probability with multiple surveys, the following formula is utilized: detection probability for >1 survey = $1-(1-p)^n$ where p is the single survey probability and n is number of surveys. Thus the overall detection probability within the Programmatic Action Area is $1-(1-0.3275)^{2.3}$, which equals 0.5985. Since TCB were captured at 23.9% of surveyed sites, dividing 0.239 by the overall detection probability of 0.5985 equals 0.3993. Thus the occupancy rate of TCB within the Programmatic Action Area is approximately 39.9%.

While most TCB captures have occurred during spring and summer, some captures have occurred in late winter (February – mid-March) and during fall (October – November) within the Coastal Plain. No captures have occurred during December and only one capture has occurred during January, although survey effort during these two months was low (USFWS, unpublished data). Such data suggest that TCB are present and somewhat active year-round in at least the Coastal Plain portion of the Programmatic Action Area. This would be consistent with the year-round presence and activity of northern long-eared bats (*Myotis septentrionalis*) in the Middle Atlantic Coastal Plain Ecoregion within North Carolina (Jordan 2020). However, it is unclear if TCB are an entirely resident population or if some individuals make seasonable movements.

Due to the near absence of caves and suitable mines, only one TCB hibernacula is known from the Coastal Plain consisting of a small cave in Onslow County which has had 8-21 TCB per survey. Seven TCB hibernacula are known from the following Piedmont counties within the Programmatic Action Area: Chatham (1), Harnett (1), Nash (1), and Montgomery (4). The six mines and one cave have each contained 0-45 TCB depending upon the survey year (NCWRC 2023, unpublished data). Undoubtedly, other unknown hibernacula occur on the landscape, and TCB may be hibernating in other structures such as culverts. TCB have been observed utilizing culverts during winter in varying states of torpor within the Programmatic Action Area. In lieu of longer-term hibernation, some TCB in the Coastal Plain may be utilizing trees as winter roosts (Newman et al. 2021) similar to northern long-eared bats in coastal North Carolina (Jordan 2020). With higher nightly winter temperatures (Grider et al. 2016), the Coastal Plain appears to provide more opportunities for winter foraging than does the Piedmont.

The NCDOT BioSurveys Group maintains a database of bat observations in bridges and culverts (Figure 3). Within the Programmatic Action Area, 51 bridges of 531 surveyed (9.6%) from May 1994 – June 2023 had roosting TCB with an average of 3 TCB per bridge. Of 353 culverts $\geq$ 4 feet diameter surveyed, 15 (4.25%) contained TCB with an average 4 TCB per culvert. Of 121

culverts < 4 feet diameter only a single culvert (0.8%) with a single TCB was observed, indicating a strong preference for culverts ≥ 4 feet diameter.

5.2. Programmatic Action Area Conservation Needs and Threats

WNS was discovered in TCB in the western edge of the Programmatic Action Area in Montgomery County in two mines in 2020 and 2022, respectively (NCWRC, unpublished data). However, affected TCB only exhibited small specks of fungus in contrast to being covered in fungus as TCB appear in infected hibernacula farther west in the Blue Ridge Mountains (Katherine Etchison, NCWRC, personal communication). In addition to these confirmed WNS cases in Montgomery County, a culvert in Guilford County (also on the western edge of the Programmatic Action Area) has tested positive for *Pd* spores two consecutive winters, although no visible signs of WNS were observed in bats (NCWRC, unpublished data). Due to shorter and relatively warmer winters which allow decreased need for hibernation and thus reduced exposure to *Pd* and WNS, the effects of WNS are likely limited in the Piedmont and likely absent from the Coastal Plain (Jordan 2020). All TCBs captured via mist netting within the Programmatic Action Area have been healthy with no signs of WNS (USFWS, unpublished data).

The Programmatic Action Area has experienced and continues to experience loss and modification of potential TCB roosting and foraging habitat through tree removal. Tree removal occurs primarily as a result of timber harvest, development, and land clearing for agriculture. In 2021, approximately $897 million of timber was delivered to sawmills within the Programmatic Action Area (Bardon 2023). The Programmatic Action Area contains significant amounts of forested conservation lands in the form of national wildlife refuges, national forests, state forests, state parks, state game lands, and other protected properties. Public ownership confers some conservation benefit to listed species by removing some threats that might otherwise be present if the properties were owned by private landowners. The distribution of TCBs within the Programmatic Action Area is patchy, and much suitable habitat remains unoccupied. As such, availability of habitat is not currently a limiting factor (Silvis et al. 2016).

The Programmatic Action Area currently contains one operating wind farm and one additional wind farm under construction set to begin operation in 2024. Collectively, the two wind farms are expected to kill 140-160 TCB per year (USFWS, unpublished data).

Climate change may result in additional sea level rise. Sea level rise would flood portions of coastal North Carolina, thus killing some trees that TCBs may potentially use for foraging and roosting. Simultaneously, a warming climate could increase insect availability during winter, increase winter bat activity, increase the areas where TCB are not dependent upon hibernacula during winter, and thus reduce their exposure to *Pd* and WNS. Additionally, a warming climate may further limit the spread of the psychrophilic *Pd* spores.

6. EFFECTS OF THE ACTION ON TRICOLORED BAT

In a PCO for a listed species, the effects of the proposed action are all reasonably certain consequences to the species caused by the action, including the consequences of other activities caused by the action. Activities caused by the action would not occur but for the action.

Consequences to species may occur later in time and may occur outside the action area. We identified and described the activities included in the proposed Action in sections 2.1–2.2. Our analyses of the consequences caused by each of these activities follows.

This PCO covers an estimated 820 individual projects that occur within the Programmatic Action Area over an approximately 5-year span from now through December 31, 2028. As part of these 820 projects, approximately 694 bridges and 856 culverts (≥ 4 feet diameter) will be replaced. Due to the rarity of TCB occurring in culverts < 4 feet diameter, such culverts will not be addressed in the effects analysis. Project construction will occur throughout the year and through all phases of the TCB life cycle. The estimated 820 individual projects will vary in size, design, and setting, so each of the following effects may or may not apply to any specific individual project.

6.1. Programmatic Activities

Tree Clearing

Tree clearing from a variety of NCDOT activities is a likely source of adverse effects to TCB. Although an adult TCB may be able to evacuate a tree that is being felled, non-volant juveniles may be killed (Belwood 2002). An adult TCB roosting in a tree during low temperatures may be in deeper torpor and less likely to escape a tree being felled, possibly resulting in mortality. Given the estimated occupancy rate of 39.9% (see Section 5.1) and the fact that most individual projects involve minimal tree clearing, the probability that any individual project would cause mortality of the species is low. However, when considered collectively, some amount of mortality is likely. The precise amount of mortality would not be determinable since dead TCB would likely go unnoticed, and estimating such mortality is difficult since TCB density data is not available. Although mortality could potentially occur at any time of the year, it is assumed that mortality would be higher during the maternity season if maternity roost trees were felled. Thus the following exercise will generate an estimate of take using some known maternity colony parameters.

Mean number of females in TCB maternity colonies range from 10-18 (Whitaker 1998, Poissant 2009). The midpoint of 14 females per colony will be assumed. Assuming a 1:1 sex ratio and two pups per female (Hoying and Kunz 1998), a total of 56 TCB (females, males, young) are assumed present within the area utilized by a maternity colony. Although there is a paucity of data on TCB maternity colony roosting area size, Poissant (2009) calculated the mean area used by five maternity colonies to be 67.5 acres. NCDOT has estimated they will clear 3280 acres of forest in the Programmatic Action Area from now through December 31, 2028. Dividing 3280 by 67.5 yields 48.6 maternity colonies. Multiplying 48.6 maternity colonies by 56 TCBs per colony yields 2721.6 bats. Finally, multiplying 2721.6 bats by 0.399 (occupancy rate) yields 1086 TCB that could be adversely affected by tree clearing within the Programmatic Action Area from now through December 31, 2028. Since many TCBs would be expected to survive a roost tree being felled (Belwood 2002), it is expected that a small but unknown percentage of the 1086 TCB would be killed while the rest would survive and be temporarily displaced. A TCB that is forced to evacuate a tree being felled will expend energy in finding another roost tree, but such energy expenditure is not likely to adversely affect the bat since TCB commonly change roost

trees (Poissant 2009). However, a bat relocating to a new roost tree during daytime could temporarily be exposed to increased predation pressure.

Habitat Loss

Due to their generalist habits in roost selection and the abundance of unoccupied forest lands (occupancy rate only 39.9%), it is assumed that removal of roosting and foraging habitat is not an adverse effect if no TCB are present. Habitat availability is not a limiting factor for this species (Silvis et al. 2016). NCDOT estimates that 3280 acres of forest will be cleared within the Programmatic Action Area over approximately five years. With approximately 11.5 million acres of timberland available within the Programmatic Action Area (Bardon 2023), NCDOT's tree removal over approximately five years represents ~ 0.03% of the overall forest available, much of which is currently unoccupied. Therefore, potential effects from habitat loss are insignificant.

Structure Demolition

Although an adult bat would likely be able to evacuate a bridge or culvert during demolition, it is possible that some TCB could be crushed or trapped during such activity. NCDOT estimates that 694 bridges will be replaced within the Programmatic Action Area from now through December 31, 2028. Using the calculated use rate of 9.6% and an average of 3 TCB per bridge (see Section 5.1), an estimated 200 TCB (694 x 0.096 x 3) could be adversely affected by bridge demolition. NCDOT estimates that 856 culverts $\geq$ 4 feet diameter will be replaced. Using the calculated use rate of 4.25% and an average of 4 TCB per culvert, an estimated 146 TCB (856 x 0.0425 x 4) could be adversely affected by culvert demolition. Most of the take associated with structure demolition would be expected to be non-lethal, but some unknown subset of the take would be expected to result is mortality of TCB.

Hibernacula

There are very few known TCB hibernacula within the Programmatic Action Area. There are no individual proposed NCDOT projects located near these hibernacula. There are undoubtedly unknown TCB hibernacula, but the possibility of an NCDOT project directly affecting one is likely discountable.

Noise, Lighting, Vibrations, and Other Disturbances

TCBs may be exposed to increased noise, lighting, vibrations and other disturbances from heavy equipment during clearing and road construction. Most such disturbances would occur during the day when the bats were not foraging. Generally, construction activities that occur during the night occur within congested urban areas where TCBs are likely not present. Although the effect of such disturbances is unknown, they would be temporary. It is assumed that TCBs could move away from such disturbances to other roost trees. Increased noise and lighting from traffic on new highways would be permanent. Data regarding the effects of traffic noise on bats is mixed. For example, Schaub et al. (2008) suggested that foraging habitat for greater mouse-eared bats (*Myotis myotis*) in Germany near noisy roads is degraded, while Zurcher et al. (2010) found that the level of noise from vehicles had no discernable effect on several species of bats (including TCB), although the presence of vehicles did significantly affect whether bats crossed roads or not. However, most new highway construction over the next five years will occur in urban areas where TCB are less likely to occur (NCDOT 2023).

Decreased Water Quality

Although NCDOT implements various best management practices to avoid or minimize degrading water quality (NCDOT 2003, NCDOT 2014, NCDOT 2015), some NCDOT activities may inadvertently cause impacts in the form of temporary sedimentation or accidental spills of petrochemicals, uncured concrete, or herbicides. Degraded water quality could affect TCB drinking water sources or affect the habitat of some of the TCB's prey base (e.g. aquatic stage of caddisflies). However, since TCBs should have little difficulty finding alternative drinking water sources or alternative prey and foraging areas, the effect on the species would likely be insignificant and/or discountable.

Mortality from Vehicle Traffic

A study conducted in coastal North Carolina which analyzed wildlife road-kills (Smith 2011) documented mortality of bats, although no dead TCB were observed. TCBs could conceivably be struck and killed by vehicles on new roads. However, new road construction over the next five years within the Programmatic Action Area will mostly occur in urban areas (NCDOT 2023) where TCB are less likely to occur. Thus mortality from vehicle traffic on new roads is assumed to be discountable.

Habitat Fragmentation

Zurcher et al. (2010) and Bennett and Zurcher (2013) found that roads can act as a barrier to bats, and the volume of traffic increases the barrier effect. Without specific data on the relationship between TCBs and current habitat connectivity levels in eastern North Carolina, only generalizations can be made about the effects of habitat fragmentation due to NCDOT activities. NCDOT projects may reduce TCB habitat connectivity, but the effect cannot be quantified. Since new road construction in rural areas over the next five years within the Programmatic Action Area is minimal (NCDOT 2023), it is assumed any effects from habitat fragmentation would be minimal. It is also assumed that the abundance of TCB habitat will act to ameliorate any fragmentation effects of NCDOT activities.

Secondary Development

While bridge/culvert replacements, maintenance activities, and road widening do not increase new development, new-location road facilities do have the potential to induce secondary development. Secondary development may result in the loss of potential habitat for the TCB. Although no quantitative analysis is available for this programmatic conference, in previous large scale transportation projects in eastern North Carolina, only a relatively small percentage of secondary development could be attributed to the road facility. Since new-location projects represent only a small portion of the overall NCDOT construction program over the next five years (NCDOT 2023) and given the fact that there is a large amount of unoccupied habitat available for the TCB, it is assumed that potential effects due to habitat loss from secondary development are insignificant.

6.2. Conservation Measures

NCDOT will provide $8-10 million for TCB studies over approximately five years. The information gained from these studies will be utilized to inform and improve conservation efforts

for the species in the future. NCDOT has agreed to avoid tree clearing within 150 feet of known maternity roost trees during the time frame of May 1 – July 15, thus reducing the probability of killing non-volant young.

6.3. Summary of Effects

Tree clearing may adversely affect up to 1086 TCB, while bridge and culvert demolition may adversely affect up to 200 and 146 TCB, respectively. Overall, up to 1432 TCB could be adversely affected by NCDOT activities within the Programmatic Action Area from now through December 31, 2028. Other potential sources of effects are likely insignificant and/or discountable. Many individual projects will likely have no effect on the species. For those individual projects that do have effects, it is anticipated that most effects will be temporary and non-lethal in nature. However, when viewed programmatically, some lethal effects are expected across the Programmatic Action Area. It is expected that only a small percentage of the TCB adversely affected will result in mortality, with the remainder being temporarily displaced.

7. CUMULATIVE EFFECTS ON TRICOLORED BAT

In Section 3, we identified activities that satisfy the regulatory criteria for sources of cumulative effects. Although it is certain that tree clearing for the timber industry, development, and for other purposes will occur within the Programmatic Action Area over the next five years, it is not possible to know the extent of the effects to TCB. In lieu of specific data, only generalizations can be made. Much of the sustainable timber industry in eastern North Carolina involves short-rotation loblolly pine (*Pinus taeda*) plantations where TCB are unlikely to be found. In the TCB-occupied areas where tree clearing does occur, most TCB present in roost trees being felled would be expected to survive (Belwood 2002). Some amount of mortality is likely to occur, but it is assumed to be minimal. Surviving TCB would only be temporarily displaced. Habitat availability is not a limiting factor for the species (Silvis et al. 2016).

8. CONCLUSION FOR TRICOLORED BAT

In this section, we summarize and interpret the findings of the previous sections (status, baseline, effects, and cumulative effects) relative to the purpose of the PCO for the TCB, which is to determine whether the Action is likely to jeopardize its continued existence.

The range of TCB includes 39 U.S. states, four Canadian Provinces, Guatemala, Honduras, Belize, Nicaragua and Mexico. Although once common throughout its range, the species has experienced estimated population declines of 90–100% across much of its range due to WNS. No other threat is as severe and immediate to the species persistence as WNS, and it would likely not be imperiled were it not for this lethal disease. The fungus that causes WNS thrives in the cool temperatures found in caves and mines where TCBs hibernate and generally kills the bats during their hibernation. Habitat availability is not considered a limiting factor for the species across most of its range.

The TCB is thought to occur in all 59 counties within the Programmatic Action Area and, based on extensive survey data collected 2015 – 2022, is estimated to occur within 39.9% of suitable

habitat available. Relatively few hibernacula are known, with all but one occurring within the Piedmont. The Coastal Plain portion of the Programmatic Action Area has almost no caves or mines suitable for hibernacula, while the Piedmont has a relatively small number of small caves and mines suitable for hibernacula. Mist net surveys indicate that some TCB are at least partially active during winter in the Coastal Plain in areas with no caves/mines, suggesting that some TCB are foregoing hibernation. TCB in the Coastal Plain are likely not susceptible to WNS. Some TCB along the western edge of the Programmatic Action Area have shown minor signs of WNS, although no mortality or declines have been detected.

Tree clearing from a variety of NCDOT activities is the most significant source of effects to TCB from the Action. While most TCB are expected to evacuate trees being felled, some non-volant juveniles can be killed during the maternity season, and some adults could be killed during extremely low temperatures while in deep torpor. It is estimated that up to 1086 TCB could be adversely affected by tree clearing. Since TCB sometimes roost in bridges and culverts, bridge and culvert demolition are estimated to adversely affect up to 200 and 146 TCB, respectively. Similar to tree clearing, it is expected that most TCB would survive demolition of bridges and culverts, but some mortality is likely to occur. Bats that survive tree clearing or demolition of structures would be temporarily displaced, and effects would be temporary. NCDOT has committed to conservation measures which will reduce the likelihood of killing non-volant young TCBs during the maternity season.

Since habitat is not a limiting factor for the species, it is assumed that loss of roosting and foraging habitat is not an adverse effect if no TCBs are present. NCDOT estimates that 3280 acres of forest will be cleared over five years. With approximately 11.5 million acres of forest available within the Programmatic Action Area, NCDOT's tree removal over five years represents ~ 0.03% of the overall available habitat, much of which is currently unoccupied. Therefore, potential effects from habitat loss are insignificant. All other potential sources of effects are also considered insignificant and/or discountable. Although some cumulative effects from tree clearing from the timber industry and other sources are likely to occur, they are relatively minor since most such clearing will occur in areas less likely to be occupied by TCBs.

The mostly non-lethal take of up to 1432 TCBs is not considered to be biologically meaningful at the range-wide scale. The small subset of the take which is lethal will not reduce appreciably the likelihood of the survival and recovery of the species. After reviewing the status of the species, the environmental baseline for the Programmatic Action Area, the effects of the Action and the cumulative effects, it is the Service's Programmatic Conference Opinion that the Action is not likely to jeopardize the continued existence of the TCB.

9. INCIDENTAL TAKE STATEMENT

ESA §9(a)(1) and regulations issued under §4(d) prohibit the take of endangered and threatened fish and wildlife species without special exemption. The term "take" in the ESA means "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct" (ESA §3(19)). In regulations, the Service further defines:

- "harm" as "an act which actually kills or injures wildlife. Such 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;" (50 CFR §17.3) and
- "incidental take" as "takings that result from, but are not the purpose of, carrying out an otherwise lawful activity conducted by the Federal agency or applicant" (50 CFR §402.02).

Under the terms of ESA §7(b)(4) and §7(o)(2), taking that is incidental to a federal agency action that would not violate ESA §7(a)(2) is not considered prohibited, provided that such taking is in compliance with the terms and conditions of an incidental take statement (ITS).

The prohibitions against taking an endangered animal species found in ESA §9, and against taking a threatened animal species adopted by regulations under §4(d), do not apply until a species is listed. The preceding PCO evaluated effects of the Action on the TCB, which is not listed under the ESA. The Service advises the FHWA and USACE to consider implementing the conservation measures, reasonable and prudent measures, and monitoring and reporting requirements provided. Voluntary implementation of these measures will facilitate adoption of the PCO as a PBO following listing of this species as endangered or threatened. Following such adoption, these measures and monitoring and reporting requirements will become non-discretionary.

9.1. Amount or Extent of Take

This section specifies the amount or extent of take of listed wildlife species that the Action is reasonably certain to cause, which we estimated in the "Effects of the Action" section of this PCO. We estimate take of TCB of up to 1432 individuals; however, only a small subset of this number would be expected to be of a lethal nature.

9.2. Reasonable and Prudent Measures

The Service believes that no reasonable and prudent measures are necessary or appropriate to minimize the amount or extent of incidental take of TCB caused by the Action. NCDOT previously agreed to conservation measures which would minimize take (See Section 2.2). Minor changes that do not alter the basic design, location, scope, duration, or timing of the Action would not reduce incidental take below the amount or extent anticipated for the Action as proposed. Therefore, this ITS does not provide reasonable and prudent measures for this species.

9.3. Terms and Conditions

No reasonable and prudent measures to minimize the impacts of incidental take caused by the Action are provided in this ITS; therefore, no terms and conditions for carrying out such measures are necessary.

9.4. Monitoring and Reporting Requirements

In order to monitor the impacts of incidental take, the NCDOT must report the progress of the Action and its impact on the species to the Service as specified in the ITS (50 CFR §402.14(i)(3)). This section provides the specific instructions for such monitoring and reporting

(M&R), including procedures for handling and disposing of any individuals of a species killed or injured. These M&R requirements are mandatory.

As necessary and appropriate to fulfill this responsibility, the FHWA and/or USACE must require any permittee, contractor, or grantee to accomplish the M&R through enforceable terms that the FHWA and/or USACE includes in the permit, contract, or grant document. Such enforceable terms must include a requirement to immediately notify the FHWA, USACE and the Service if the amount or extent of incidental take specified in this ITS is exceeded during Action implementation.

M&R1. Disposition of Dead TCBs

If dead bats suspected of being TCB are observed during clearing, demolition, or construction activities of the Action, such bats should be collected and preserved for identification. Gary Jordan of the Service's Raleigh Field Office should be contacted at gary_jordan@fws.gov to arrange a transfer of the bats. Dead bats should be placed in a freezer until they can be transferred.

M&R2. Bat Habitat Assessment SOP

NCDOT staff and/or consultants must follow the NCDOT Bat Habitat Assessment SOP by filling out Bat Habitat Assessment Forms for projects that affect bridges and culverts. These forms will be submitted to the NCDOT Biological Surveys Group and entered into its database even if no bat presence is detected. If TCBs are detected at a bridge or culvert, the Service will be notified via email at gary_jordan@fws.gov .

10. CONSERVATION RECOMMENDATIONS

§7(a)(1) of the ESA directs federal agencies to use their authorities to further the purposes of the ESA by conducting conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary activities that an action agency may undertake to avoid or minimize the adverse effects of a proposed action, implement recovery plans, or develop information that is useful for the conservation of listed species.

NCDOT should continue to provide staff to assist in systematic bat surveys currently being led by the Service.

11. REINITIATION NOTICE

Formal programmatic conference for the Action considered in this PCO is concluded. The FHWA and USACE may submit a written request to the Service to confirm the PCO as a PBO issued through formal consultation if the FHWA and USACE retain discretionary involvement or control over the Action when species addressed in the PCO are listed. This request should advise the Service of any new information about the Action or its effects on such species that is relevant to adopting the PCO as a PBO, including the amount or extent of any taking of the newly-listed species that the Action has caused.

The incidental take statement provided for non-listed species in a PCO does not become effective until such species are listed and the PCO is adopted as a PBO. At that time, the Service will review the Action to determine whether modifying the opinion and incidental take statement to reflect new information is appropriate. If the Service finds no significant changes in the Action as proposed or in the information used during the conference, the Service will confirm the PCO as a PBO for the Action, which shall conclude formal consultation.

Thereafter, reinitiating consultation is required if the FHWA and USACE retain discretionary involvement or control over the Action (or is authorized by law) when:

a. the amount or extent of incidental take is exceeded;
b. new information reveals that the Action may affect listed species or designated critical habitat in a manner or to an extent not considered in the PBO;
c. the Action is modified in a manner that causes effects to listed species or designated critical habitat not considered in the PBO; or
d. a new species is listed or critical habitat designated that the Action may affect.

In instances where the amount or extent of incidental take is exceeded, the FHWA and USACE is required to immediately request a reinitiation of formal consultation.

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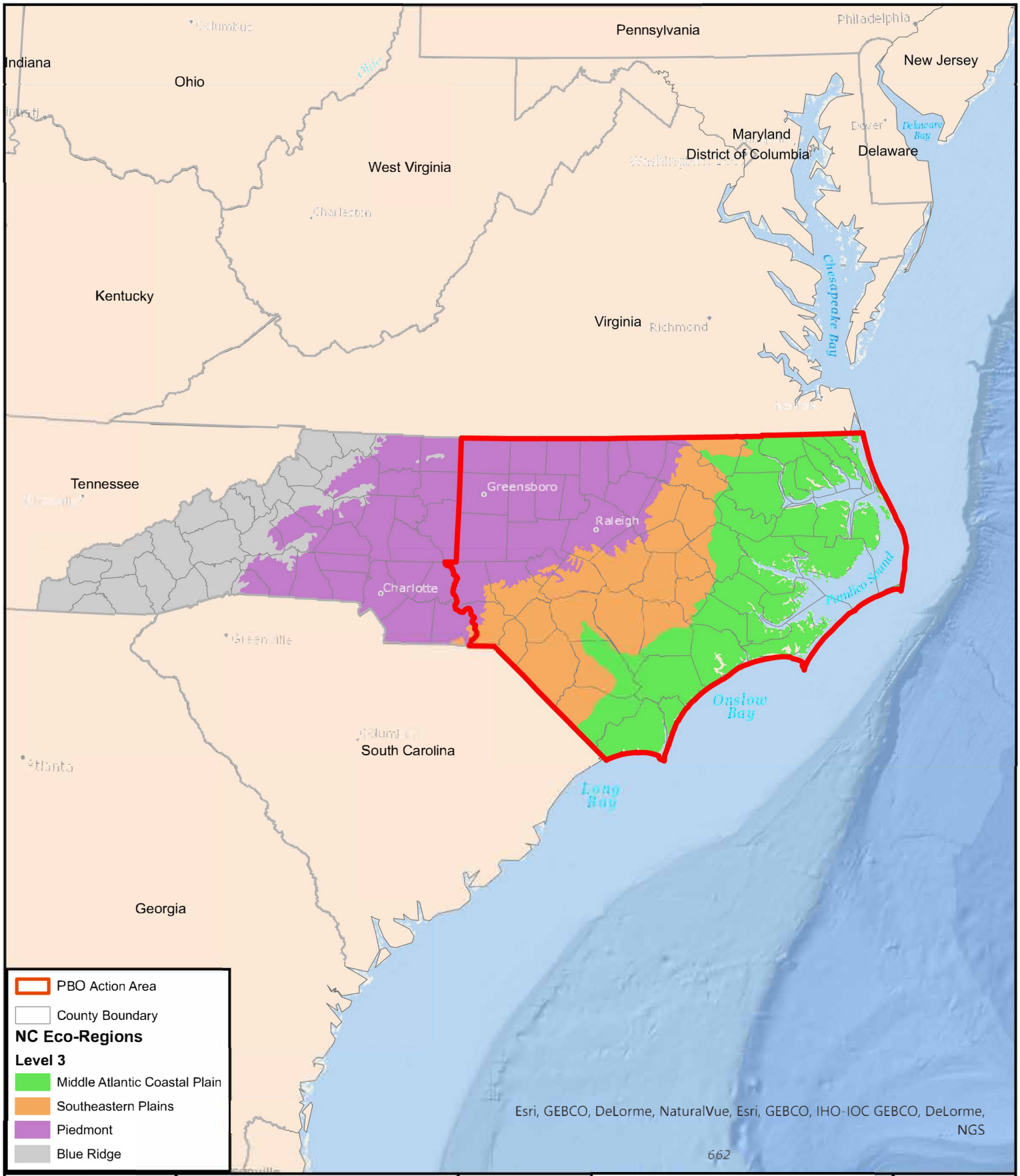
Appendix

Figures 1-3



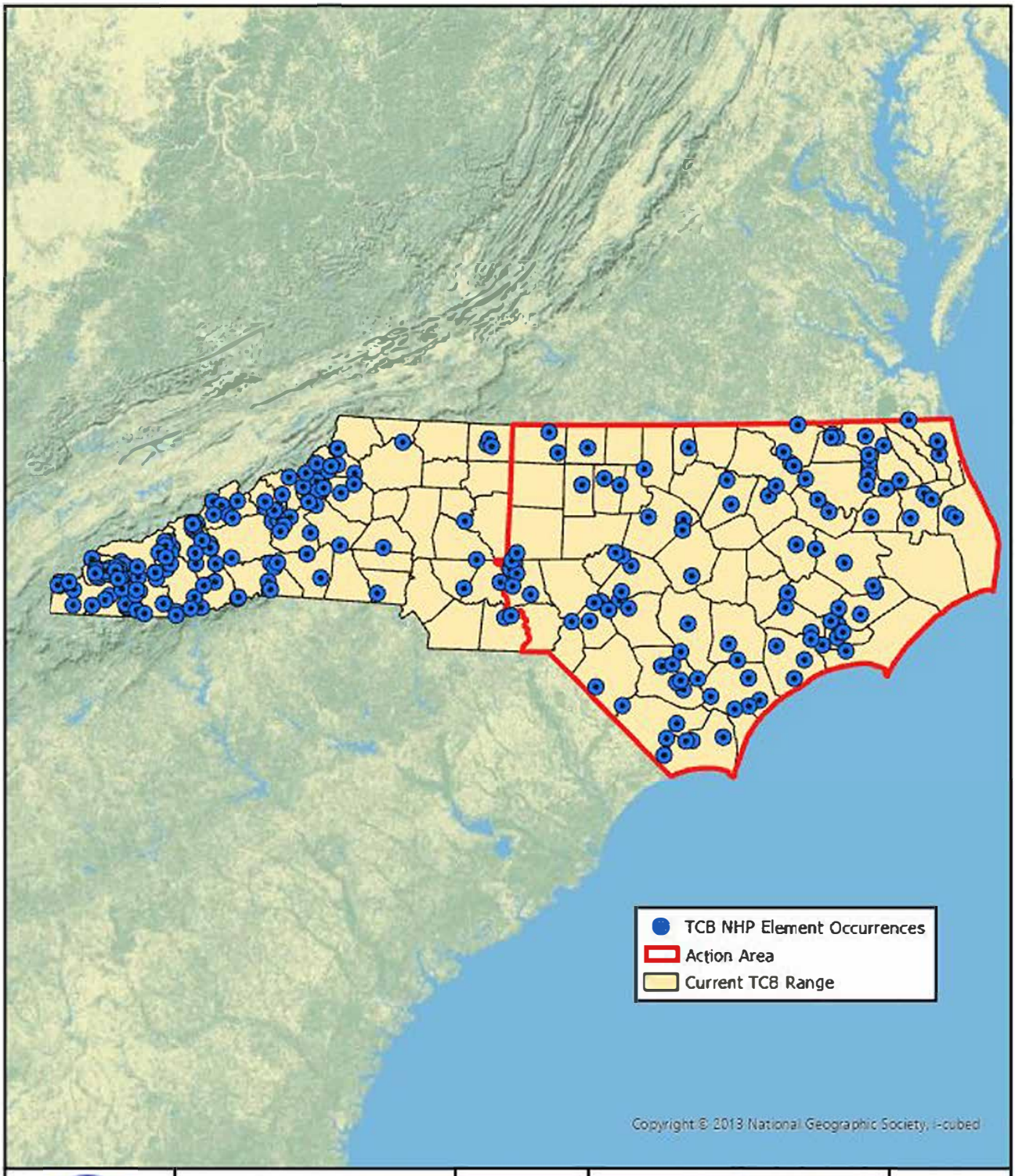
Prepared by NCDOT 5/10/23

EPA Ecoregions and PBO Action Area

0 10 20 40 Miles

USFWS Raleigh Field Office

FIG 1



Prepared by NCDOT 5/10/23

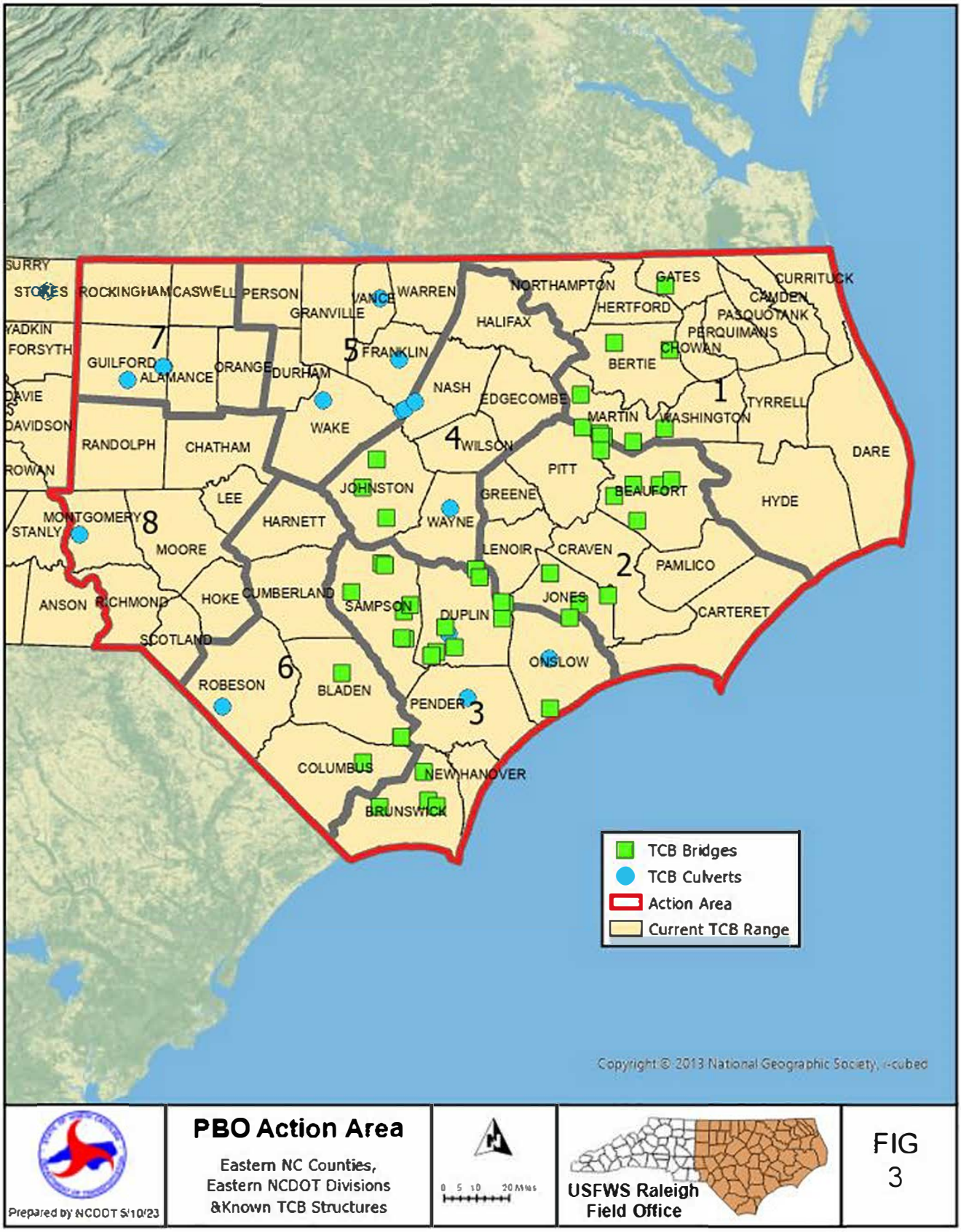
TCB in NC

Known Range of TCB based on NHP Element Occurrence Records (through 12/2021)

0 10 20 40 Miles

USFWS Raleigh Field Office

FIG 2



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PBO Action Area

Eastern NC Counties,
Eastern NCDOT Divisions
&Known TCB Structures

0 5 10 20 Miles

USFWS Raleigh Field Office

FIG 3