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Standing Analysis for the Georgia Statewide Determination Key

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Prepared by
The Georgia Ecological Services Field Office

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1 ACRONYMS AND ABBREVIATIONS

CFR	Code of Federal Regulations
CH	Critical Habitat
DKey	Determination Key
ESA	Endangered Species Act of 1973
ESFO	Ecological Services Field Office
FAA	Federal Aviation Administration
FCC	Federal Communications Commission
FR	Federal Register
Georgia / GA DNR	Georgia Department of Natural Resources
LAA	“Likely to adversely affect” determination
NE	“No effect” determination
NLAA	“May affect, not likely to adversely affect” determination
PCE	Primary constituent element
RCW	Red-cockaded woodpecker
USACE	U.S. Army Corps of Engineers

2 INTRODUCTION

2.1 Purpose of the Standing Analysis

This standing analysis provides an optional, streamlined consultation and technical assistance process for federal action agencies and designated non-federal representatives to address potential effects of future actions, pursuant to section 7 of the Endangered Species Act of 1973 (Act), as amended (16 U.S.C. 1531 *et seq*.), to the species and Critical Habitats listed in Table 1. The U.S. Fish and Wildlife Service (Service) developed this standing analysis to streamline the process of reviewing actions that would result in a "may affect, not likely to adversely affect" (NLAA) determination for the subject species. This standing analysis also provides proactive technical assistance to federal action agencies in making a "no effect" (NE) determination.

This standing analysis provides an optional consultation and technical assistance for federal actions that meet the criteria described below as delivered through a Determination Key (DKey) in the Service's Information for Planning and Consultation (IPaC) application. To obtain consultation documents, including technical assistance for NE and concurrence with NLAA determinations, federal agencies and other project representatives must use the associated DKey in IPaC to answer questions about the proposed action. By screening the project through the DKey, all or part of the standing analysis is adopted by the federal action agency and used to submit a concurrence request to support their NLAA determination. It also provides technical information to help project representatives determine whether an action will have no effect on the species or Critical Habitat. Formal consultation under Section 7(a)(2) of the Act is required for actions that "may affect" a listed species and/or Critical Habitat, unless the Service concurs in writing that actions "may affect, are not likely to adversely affect" listed species and Critical Habitat. Actions which an action agency determines will have "no effect" on species or Critical Habitat do not require submittal to the Service.

With the IPaC DKey established for this standing analysis, the action agency may receive a letter of concurrence for eligible projects by providing specific information requested by the DKey. Throughout the remainder of this document, statements regarding this standing analysis refer to both the standing analysis and the associated DKey. The Georgia Ecological Services Field Office (Georgia ESFO) notes successful completion of this key requires a thorough review and familiarity with the documents, laws, and regulations relevant to the project. Action agencies should review the relevant documents, laws, and regulations prior to proceeding with this key, which may include:

- U.S. Endangered Species Act (https://www.fws.gov/law/endangered-species-act)
- U.S. Fish and Wildlife Coordination Act (https://www.fws.gov/law/fish-and-wildlife-coordination-act)
- Georgia's Erosion and Sedimentation Control Act (https://gaswcc.georgia.gov/urban-erosion-sediment-control/technical-guidance)
- Georgia Stormwater Management Manual https://atlantaregional.org/what-we-do/natural-resources/georgia-stormwater-management-manual/

- Georgia's Environmental Protection Division NPDES Stormwater Permits https://epd.georgia.gov/watershed-protection-branch/stormwater
- Metropolitan North Georgia Water Planning District Model Stream Buffer Protection Ordinance (https://northgeorgiawater.org/wp-content/uploads/2018/08/Stream-Buffer-Protection.pdf)
- Permit Special Conditions for Manatee (https://www.fws.gov/story/manatee-conservation-georgia)
- U.S. Clean Water Act (https://www.fws.gov/policy-library/561fw3)

Table 1. Species and Critical Habitats covered in the standing analysis for the Georgia Statewide Determination Key, including their listing status under the Endangered Species Act where T=threatened, E=endangered, EPNE=non-essential experimental population. Note this standing analysis only covers final species and Critical Habitat in Georgia only. There may be proposed or finalized species and/or Critical Habitat in other parts of the country.

Taxa	Common Name	Scientific Name	ESA Status	Critical Habitat
Bird	Eastern Black Rail	*Laterallus jamaicensisssp. jamaicensis*	T	--
Bird	Red-Cockaded Woodpecker	*Picoides borealis*	E	--
Bird	Piping Plover	*Charadrius melodus*	T	Final
Bird	Rufa Red Knot	*Calidris canutus rufa*	T	Proposed
Reptile	Eastern Indigo Snake	*Drymarchon couperi*	T	--
Reptile	Green Sea Turtle	*Chelonia mydas*	T	Proposed
Reptile	Hawksbill Sea Turtle	*Eretmochelys imbricata*	E	Final
Reptile	Kemp's Ridley Sea Turtle	*Lepidochelys kempii*	E	Proposed
Reptile	Leatherback Sea Turtle	*Dermochelys coriacea*	E	Final
Reptile	Loggerhead Sea Turtle	*Caretta caretta*	T	Final
Reptile	Suwannee Alligator Snapping Turtle	*Macrochelys suwanniensis*	T	--
Amphibian	Frosted Flatwoods Salamander	*Ambystoma cingulatum*	T	Final
Amphibian	Reticulated Flatwoods Salamander	*Ambystoma bishopi*	E	Final
Fish	Amber Darter	*Percina antesella*	E	Final
Fish	Blue Shiner	*Cyprinella caerulea*	T	--
Fish	Cherokee Darter	*Etheostoma scotti*	T	--
Fish	Conasauga Logperch	*Percina jenkinsi*	E	Final
Fish	Etowah Darter	*Etheostoma etowahae*	E	--
Fish	Frecklebelly Madtom	*Noturus munitus*	T	Final
Fish	Goldline Darter	*Percina aurolineata*	T	Proposed
Fish	Trispot Darter	*Etheostoma trisella*	T	Final
Mussel	Alabama Moccasinshell	*Medionidus acutissimus*	T	Final
Mussel	Altamaha Spinymussel	*Elliptio spinosa*	E	Final
Mussel	Coosa Moccasinshell	*Medionidus parvulus*	E	Final
Mussel	Fat Threeridge	*Amblema neislerii*	E	Final
Mussel	Finelined Pocketbook	*Hamiota altilis*	T	Final
Mussel	Georgia Pigtoe	*Pleurobema hanleyianum*	E	Final
Mussel	Gulf Moccasinshell	*Medionidus penicillatus*	E	Final
Mussel	Ochlockonee Moccasinshell	*Medionidus simpsonianus*	E	Final
Mussel	Oval Pigtoe	*Pleurobema pyriforme*	E	Final
Mussel	Purple Bankclimber	*Elliptoideus sloatianus*	T	Final

Taxa	Common Name	Scientific Name	ESA Status	Critical Habitat
Mussel	Shinyrayed Pocketbook	*Hamiota subangulata*	E	Final
Mussel	Southern Clubshell	*Pleurobema decisum*	E	Final
Mussel	Southern Pigtoe	*Pleurobema georgianum*	E	Final
Mussel	Suwannee Moccasinshell	*Medionidus walkeri*	T	Final
Mussel	Triangular Kidneyshell	*Ptychobranchus greenii*	E	Final
Snail	Interrupted (=Georgia) Rocksnail	*Leptoxis foremani*	E	Final
Plant	American hart's-tongue fern	*Asplenium scolopendrium var. americanum*	T	--
Plant	Florida Torreya	*Torreya taxifolia*	E	--
Lichen	Rock Gnome Lichen	*Gymnoderma lineare*	E	--
Plant	Alabama Leather Flower	*Clematis socialis*	E	--
Plant	American Chaffseed	*Schwalbea americana*	E	--
Plant	Canby's Dropwort	*Oxypolis canbyi*	E	--
Plant	Cooley's Meadowrue	*Thalictrum cooleyi*	E	--
Plant	Fringed Campion	*Silene polypetala*	E	--
Plant	Georgia Rockcress	*Arabis georgiana*	T	--
Plant	Green Pitcher-Plant	*Sarracenia oreophila*	E	--
Plant	Hairy Rattleweed	*Baptisia arachnifera*	E	--
Plant	Harperella	*Ptilimnium nodosum*	E	--
Plant	Kral's Water-Plantain	*Sagittaria secundifolia*	T	--
Plant	Large-Flowered Skullcap	*Scutellaria montana*	T	--
Plant	Michaux's Sumac	*Rhus michauxii*	E	--
Plant	Mohr's Barbara's Buttons	*Marshallia mohrii*	T	--
Plant	Morefield's Leather Flower	*Clematis morefieldii*	E	--
Plant	Ocmulgee Skullcap	*Scutellaria ocmulgee*	E	Final
Plant	Persistent Trillium	*Trillium persistens*	E	--
Plant	Pondberry	*Lindera melissifolia*	E	--
Plant	Relict Trillium	*Trillium reliquum*	E	--
Plant	Small Whorled Pogonia	*Isotria medeoloides*	T	--
Plant	Smooth Coneflower	*Echinacea laevigata*	T	--
Plant	Swamp Pink	*Helonias bullata*	T	--
Plant	Tennessee Yellow-Eyed Grass	*Xyris tennesseensis*	E	--
Plant	Virginia Spiraea	*Spiraea virginiana*	T	--
Plant	White Fringeless Orchid	*Platanthera integrilabia*	T	--
Plant	Whorled Sunflower	*Helianthus verticillatus*	E	Final
Plant	Black Spored Quillwort	*Isoetes melanospora*	E	--
Plant	Little Amphianthus	*Amphianthus pusillus*	T	--
Plant	Mat-Forming Quillwort	*Isoetes tegetiformans*	E	--
Mammal	Gray Bat	*Myotis grisescens*	E	--
Mammal	West Indian Manatee	*Trichechus manatus*	T	Final

2.2 Benefits of the Standing Analysis

For those federal actions that the Service has accumulated significant knowledge in analyzing previously, the Service is able to develop a standing analysis to streamline the consultation process for eligible federal actions. The streamlined process facilitated by this standing analysis will reduce the amount of Service staff time necessary to review actions requesting consultation and provide federal agencies, consultants, and other project proponents a predictable, consistent,

and timely response for qualified actions. In addition, development of a standing analysis to assess the impacts of individual projects allows the Service to track multiple independent actions on listed species and Critical Habitat.

2.3 Eligibility for use of the Standing Analysis

A standing analysis does not convey concurrence with NLAA determinations for individual projects. Rather, it serves as a streamlining tool. Action agencies may use it to develop their request for concurrence from the Service and support their finding that the action is not likely to adversely affect species and Critical Habitat. The standing analysis also allows the Service to quickly evaluate an action agency's analysis of effects to listed species and Critical Habitat. If the action agency's proposed action is consistent with covered[1] area and covered activities, including any required conservation measures in the standing analysis, the Service will concur that the action will have insignificant, discountable, or completely beneficial effects on the relevant listed species and Critical Habitat (i.e., NLAA).

The standing analysis may also provide technical information to help agencies identify actions that will have no effect on the listed species and Critical Habitat. For projects that do not qualify to use the standing analysis, action agencies/project proponents should coordinate directly with the Georgia ESFO and address any consultation requirements.

2.4 Ensuring Accurate Determinations

As is true in all consultation procedures, the Service relies on complete and accurate information provided by federal action agencies during consultation. To apply this standing analysis to a project, it is the responsibility of the action agency/project proponent to provide information that is truthful and accurate and that fully represents the entire scope of the project to comply with the Act.

Delineate the Action Area

Under the Endangered Species Act, the Action Area includes "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action". A detailed account and analysis of all project activities is necessary to encompass all temporary and permanent changes to "land, water, and air" caused by activities that would not occur but for the proposed action and are reasonably certain to occur. An accurate Action Area allows the federal action agency or designated non-federal representative to use the appropriate scope of analysis when evaluating the effects of an action, including direct and indirect effects of the proposed action on the species and/or critical habitat and its interrelated and interdependent activities

[1] The term "covered" is used throughout this document to define the limits of use of a standing analysis. However, although the area, activities, and species are "covered" by the standing analysis, the future activities themselves are not "covered" by the standing analysis; there are additional steps (with or without a DKey) that take place for an action agency to utilize the information in the standing analysis and to request FWS concurrence that their proposed action is NLAA for listed species and Critical Habitat.

associated with the project. The Action Area also includes areas that are used to help offset project impacts (e.g., areas where species are to be relocated, mitigation areas, etc.).

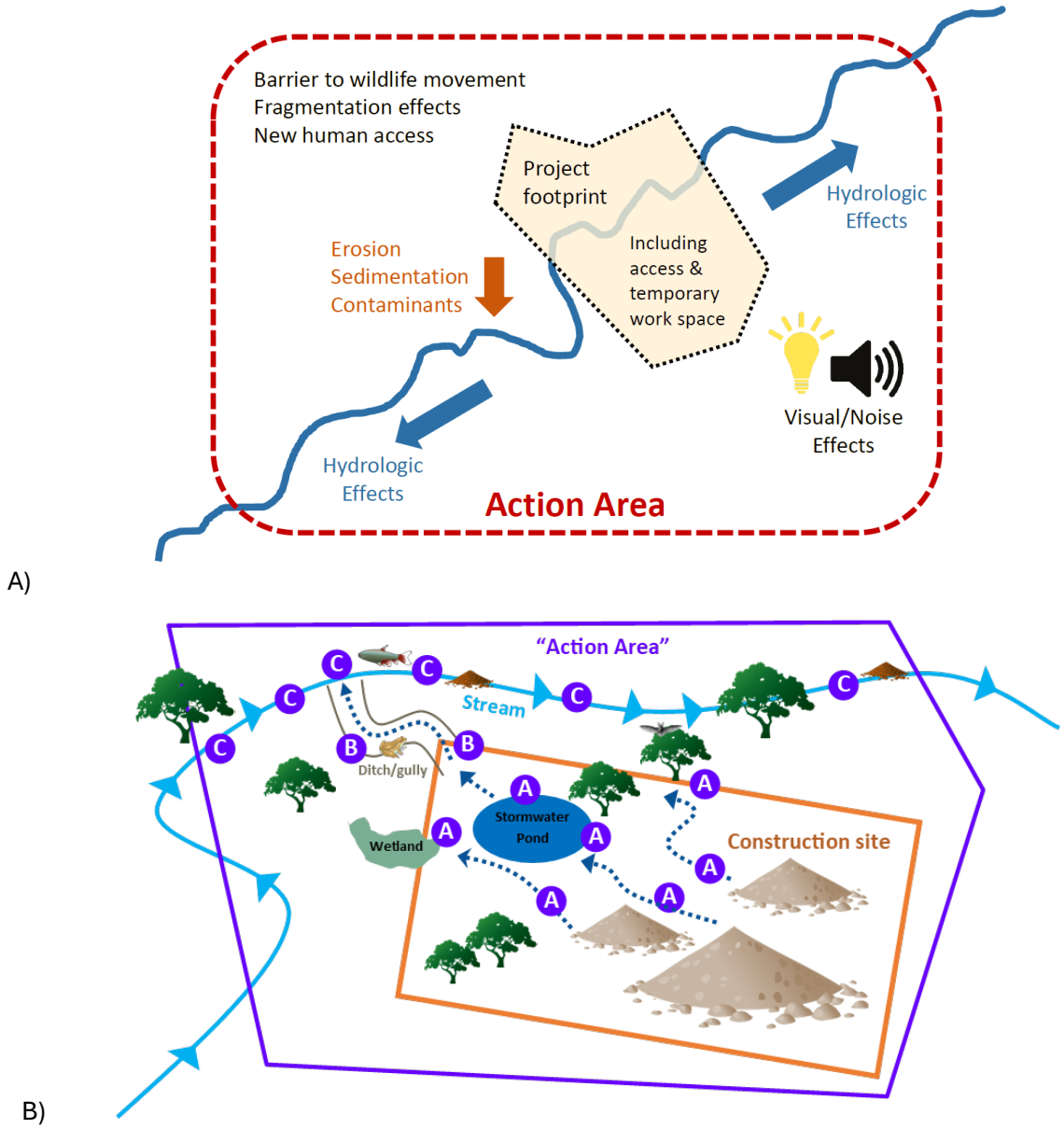

Figure 2. Diagrams of the action area, which includes the project footprint and all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action. Image credits: A) USFWS and B) U.S. Environmental Protection Agency.

As an example, the action area should include at least the following areas (Fig. 2B):

A. The areas on the construction site where stormwater discharges originate and flow toward the point of discharge into the receiving waters. This includes: areas on the construction site where excavation, site development, or other ground disturbance activities occur; and

areas where stormwater controls will be constructed and operated, including any areas where stormwater flows to and from the stormwater controls and the immediate vicinity.

B. The areas in the vicinity of the construction site where stormwater discharges flow from the construction site to one or more points of discharge into receiving waters. (Example: Where stormwater flows into a ditch, swale, or gully that leads to receiving waters.)
C. The extent of the receiving water potentially affected by stormwater discharges from your construction site through alteration of water chemistry, turbidity, temperature, or bank structure (i.e., erosive flow), regardless of whether the construction site is adjacent to the receiving water.

USACE Small Federal Handle

The Service understands that the USACE 'jurisdictional area' is the 'permit area' that the USACE deems subject to analysis under the National Environmental Policy Act (NEPA; 42 U.S.C. 4321 et seq.). The Service also acknowledges that the ESA and NEPA are different laws with distinct definitions that serve different purposes.

Under the ESA, the "action area means all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action." The "Effects of the action are all consequences to listed species or critical habitat that are caused by the proposed action, including the consequences of other activities that are caused by the proposed action but that are not part of the action. A consequence is caused by the proposed action if it would not occur but for the proposed action, and it is reasonably certain to occur. Effects of the action may occur later in time and may include consequences occurring outside the immediate area involved in the action." (50CFR§402.02).

The USACE and the Service have "Small Federal Handle" procedures (USFWS 2017; USACE 2017). These procedures entail that if an applicant's Project could not occur but for a USACE permit, then the effects of the applicant's activities within the USACE's permit area (jurisdictional area) and the effects of upland or downstream activities must be considered in context of section 7(a)(s) of the ESA.

Under the "Small Project Handle" policy, the USACE will consider direct and indirect effects to listed species and their Critical Habitats (if designated), as well as interrelated or interdependent actions associated with the project. The action area should include both jurisdictional waters and upland habitat on the site, as well as downstream impacts associated with project actions (e.g., increased stormwater runoff, sediment and contaminant movement from the site, bank erosion due to riparian removal).

The Service believes addressing the entire action area under section 7 provides the most efficient and timely path forward for USACE, the applicant, and the Service to address ESA compliance.

This Georgia Statewide Dkey is eligible for USACE projects that employ small federal handle procedures; projects that do not employ small federal handle procedures (i.e., only evaluate effects for the Corps jurisdictional area) will be omitted from the program and returned to our office for manual review.

Evaluate Suitable Habitat within the Action Area

Determine whether listed species may occur based on the habitat within the Action Area. For each species evaluated by this DKey, use the best available information (e.g., Georgia DNR Biodiversity Portal, Five-Year Reviews, habitat assessments/surveys, and other information available on the USFWS species profiles pages) to determine whether the Action Area contains suitable habitat. Habitat assessments or surveys must be conducted by a qualified professional during appropriate survey times. Survey reports and supporting documents should be uploaded through the DKey. Handling or research on endangered plants and animals is a regulated activity. State and federal permits may be required for certain species.

- If you can confirm suitable habitat is absent within the Action Area, document what source(s) of information you consulted and the justification for this conclusion.
- If you determine that suitable habitat may be present or are uncertain whether habitat may support listed species, a detailed habitat assessment is recommended.
- If suitable habitat occurs within the Action Area, species surveys are recommended. Document that suitable habitat is present along with the source(s) of information you consulted and the justification for this conclusion. Upload any survey reports through the DKey.
- If suitable habitat occurs within the Action Area but surveys are not conducted, include this information in your project review package. It may be necessary to assume presence for species in these circumstances and consider implementing appropriate avoidance and minimization measures, accordingly.

Where appropriate in our analysis, we note which activities are expected to have no effect[2] on a species or Critical Habitat. This information is provided as technical assistance to action agencies making no effect/may affect determinations.

Limitations of this DKey

Project details may not always be accurately captured through the questions included in this DKey. While this DKey is an effort to streamline consultations, we first and foremost want to help action agencies ensure accurate determinations:

- A 'no effect' conclusion would be appropriate if the proposed action – or other activities that are caused by the proposed action – would have no consequences to listed species or Critical Habitat. Concurrence from the Service is not required.

[2] A "no effect" determination is appropriate when either the species is not present in the action area or is not exposed to any possible stressors or impacts from the proposed action, or the proposed action would not result in any physical, chemical, biotic changes to the environment that are reasonably certain to occur and would not occur but for the action (i.e., no action area can be defined). This footnote needs to be changed because this is not accurate. A no-effect determination is also appropriate if it would not result in any physical, chemical, biotic changes to the environment that are reasonably certain to occur and would not occur but for the action (i.e., no action area can be defined).

- A ‘may affect’ determination would be appropriate if the proposed action – or other activities that are caused by the proposed action – may have consequences to listed species or Critical Habitat.
- If a “may affect” determination is made for a species or Critical Habitat, please include all conservation measures proposed to avoid, minimize, or mitigate for potential impacts. This will help you determine if a may affect determination is “likely to adversely affect” or “not likely to adversely affect” the species or Critical Habitat.
- A proposed action warrants a "may affect, not likely to be adversely affect" finding when its effects – and the effects of other activities that are caused by the proposed action – are wholly beneficial, insignificant, or discountable. Beneficial effects have contemporaneous positive effects without any adverse effects to the species or habitat. Insignificant effects relate to the size of the impact and include those effects that are undetectable, not measurable, or cannot be evaluated. Discountable effects are those extremely unlikely to occur. These determinations require informal consultation and written concurrence from the Service.
- A proposed action warrants a “may affect, likely to adversely affect” finding when the proposed action – or other activities caused by the proposed action – will have negative consequences to listed species or resources. These determinations require formal consultation and written concurrence from the Service.

An action agency should always reach out if a different determination than what is generated using this DKey seems more appropriate.

2.5 Updates to the Standing Analysis

This standing analysis will be reviewed annually and updated as needed to ensure the analysis contains the best scientific and commercial data available. This update process will include regular reviews to ensure that the analysis is accurate and valid, and that the standing analysis still meets the Act’s requirements. All updates will also ensure that the logic is sound, and determinations are appropriate for covered activities. Updates will be signed under an updated cover.

Projects reviewed under this standing analysis must rely on the version that is current on the date consultation is completed. For reference, both current and previous versions of the standing analysis will be maintained by the Georgia ESFO.

If we revise the standing analysis and determine reinitiation is required for any ongoing activities that used the previous standing analysis, the Service will contact the respective action agency and advise them of their need to reinitiate.

3 COVERED AREA

This standing analysis applies within the entire state of Georgia. To qualify to use this standing analysis and the associated DKey, a project’s action area must fall completely within the state of Georgia.

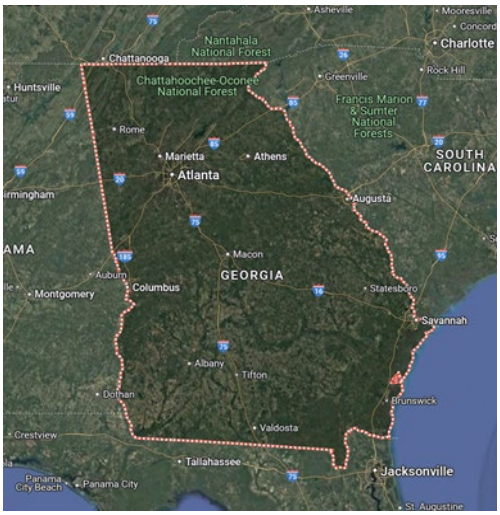

Figure 1. This standing analysis covers the entire state of Georgia.

4 COVERED ACTIONS AND ACTIVITIES

The activities described herein include all activities addressed in this standing analysis. The activity description, conservation measures, and covered area inform the standing analysis and describe which specific activities are appropriate for NE or NLAA outcomes under this analysis. The description of activities and their inclusion in the standing analysis should not be construed to indicate that these activities will always result in effects on the species or its Critical Habitat, nor is it meant to cover activities that fall outside of the analysis as described below. Action agencies are not required to use this standing analysis; they continue to have the option to request individual consultation on a project. However, in most cases, we anticipate that use of the standing analysis will substantially decrease consultation timeframes.

For Endangered Species Act, Section 7 consultation action agencies shall consider the whole action area, which may be larger than the project footprint or activities in the action agency's jurisdictional area (Figure 2).

4.1 Eligible Actions and Activities

This standing analysis applies to a wide array of projects, including but not limited to urban and residential development, transportation infrastructure, coastal and recreational development, energy and industrial development, water resource and environmental management projects, and agricultural and forestry practices. Proposed actions and activities that will not affect listed species and or critical habitat, or where the effects on listed species are expected to be discountable, insignificant, or completely beneficial[3], are eligible to receive letters of concurrence

[3] Beneficial effects are contemporaneous positive effects without any adverse effects to the species. Insignificant effects relate to the size of the impact and should never reach the scale where take occurs.

or consistency with “no effect” or “may affect, not likely to adversely affect” determinations based on this standing analysis.

Eligible projects may or may not overlap with suitable habitat or critical habitat. If either direct or indirect impacts to a species’ habitat are anticipated because of the project, the project must implement conservation measures to avoid or minimize the potential for adverse impacts to the species and adverse modification of any Designated Critical Habitat such that any effects are discountable, insignificant, or completely beneficial.

If a project has "more than negligible potential to have adverse effects on the species or critical habitat", it is not eligible to obtain clearance through the DKey; project managers should instead coordinate directly with the Georgia Ecological Services Field Office.

The proposed action is the compilation of many different types of projects that, depending on their size and specific location, often are not likely to adversely affect any federally listed threatened or endangered species or critical habitats in Georgia. Common project types include, but are not limited to, the following:

- Vegetation management, including mowing, a subset of forestry activities, prescribed burning, and harvest
- Construction, maintenance, operation, and/or removal of:
    - Roads and trails
    - Communication towers
    - Transmission and utility lines
    - Bridges and culverts
- Commercial, residential, and recreational developments
- Agricultural activities
- Site/habitat restoration/enhancement

Vegetation management is the practice of controlling and managing plant growth. Vegetation management can include the use of equipment, tools or hands to remove or modify vegetation through cutting, pulling, grinding, burning or other methods.

Construction, maintenance, operation and/or removal of objects, systems or organizations includes the use of equipment, tools or hands to build, create, attach or remove elements, materials, structures or pieces of equipment.

Commercial, residential, and recreational development includes creating new buildings or structures for business use, residential use, and recreational use respectively. Development encompasses various types of properties like office buildings, retail spaces, industrial facilities, family homes, apartments, facilities and spaces for recreational activities.

Discountable effects are those extremely unlikely to occur. Based on best judgment, a person would not: (1) be able to meaningfully measure, detect, or evaluate insignificant effects; or (2) expect discountable effects to occur.

Agricultural activities encompass a wide range of practices involved in cultivating crops and raising livestock, including soil preparation, planting, irrigation, weeding, harvesting, mowing, and storage.

Site and habitat restoration or enhancement involves rehabilitating degraded eco-systems to restore their ecological function and diversity. Restoration efforts can include removing invasive species, planting native vegetation, and restoring natural waterways through in-stream or riparian activities.

Dredging and filling wetlands or waterbodies are processes that involve moving and placing earth materials, particularly in water bodies. Dredging is the removal of sediment and other materials from the bottom or banks of a water body, while filling is the placement of materials, such as sand, rock, or other materials, into a water body or wetland.

Federal Actions and Activities Covered Under Programmatic Agreements

The following project types and activities covered are eligible to use this DKey:

1. Projects applying for a Nationwide (General) Permit or Letter of Permission with the U.S. Army Corps of Engineers, Savannah and Mobile Districts, as required under Section 404 of the Clean Water Act
2. Emergency Conservation Program (ECP), Emergency Forest Restoration Program (EFRP), Farm Storage Facility Loan (FSFL), Tree Assistance Program (TAP), and FSA Loan Activities to Include New Ground Disturbance and/or Construction (https://www.fws.gov/sites/default/files/documents/Consultation-Guidance-FSA-FWS-20220502.pdf)
3. Construction or Co-location of New Communications Towers less than 200 feet Above Ground Level in Georgia in accordance with Federal Communications Commission Environmental Review Rules and Guidelines (https://www.fws.gov/sites/default/files/documents/GAES-Consultation-Guidance-FCC-FWS-20220718_signed.pdf)
4. Georgia Department of Transportation highway projects subject to Federal Highway Administration (FHWA) review under 23 CFR 771 - Environmental Impact and Related Procedures that will have no adverse effects on listed species and Critical Habitat (https://www.dot.ga.gov/PartnerSmart/EnvironmentalProcedures/Ecology1/References/Joint%20Coordination%20Procedures%20-%20GDOT-OES.pdf)
5. Georgia Department of Transportation project types included in the "Range wide Programmatic Biological Assessment of Effects Report for Eastern Indigo Snake, Gopher Tortoise, and Southeast Pocket Gopher on Roadway Maintenance and Safety Projects" (https://www.fws.gov/media/gdot-roadway-maintenance-and-safety-projects-programmatic-december-2020)
6. Georgia Department of Transportation project activities listed in "Table 1. Programmatic 'No Effect' Activities" of the "Standard Operating Procedures for Programmatic Determinations for Listed Species" of the "Joint Coordination Procedures Among the Federal Highway Administration, Georgia Division, U.S. Fish and Wildlife Service Georgia Ecological Services Office, Georgia Department of Natural Resources, and Georgia Department of Transportation for Streamlining Interagency Coordination and Consultation

under the Endangered Species Act, Fish and Wildlife Coordination Act, Migratory Bird Treaty Act, Bald and Golden Eagle Protection Act, Georgia Wildflower Preservation Act, and Georgia Endangered Wildlife Act" (https://www.dot.ga.gov/PartnerSmart/EnvironmentalProcedures/Ecology1/References/Joint%20Coordination%20Procedures%20-%20GDOT-OES.pdf)

4.2 Limitations for Use of the Standing Analysis

To assist action agencies/project proponents in determining whether their project meets the requirements of this standing analysis, the Service will provide a series of questions (Appendix A) to assess whether the action is not likely to adversely affect listed species or Critical Habitat because the impacts are either unable to be meaningfully measured, detected, or evaluated and, therefore, insignificant; or extremely unlikely to occur and, therefore, discountable.

Actions that include certain activities, occur in certain geographic areas, or meet one or more context-dependent conditions will not be eligible to use the standing analysis. Actions that only consider the U.S. Army Corps of Engineers jurisdictional area, rather than the entire Action Area, (i.e., "small federal handle" approach) during their effects analysis are not eligible to use the standing analysis. For projects requiring consultation that do not qualify due to one or more of these exclusions, action agencies/project proponents must contact the Georgia ESFO directly to complete their consultation requirements.

Activity-Based Limits

To receive the Service's acknowledgement of an action agency's NE determination, or concurrence for an NLAA determination, project activities may not include:

- Intentional take of listed species (e.g., research, direct species management, surveys, and/or studies that include intentional handling/encountering, harassment, collection, or capturing of any individual of a federally listed threatened, endangered or proposed species)
- Projects requiring Coastal Barrier Resources Act (16 U.S.C. 3501 *et seq*.) consultation
- Projects requiring an Individual Permit under Section 404 of the Clean Water Act
- New point source discharge into a stream or changes to an existing point source discharge (e.g., outfalls; leachate ponds);
- New surface water or groundwater withdrawals;
- Projects initiating emergency consultation under Executive Order 14156 (Declaring a National Energy Emergency)
- New temporary or permanent impacts to habitat within Georgia's coastal beaches, sandy north/south island ends, or associated dunes (Note: Impacts may include but are not limited to artificial lighting at night [i.e., existing lighting now made visible from the beach, installation of new lighting, or skyglow], beach nourishment, sand scraping, armoring, or other activities requiring heavy equipment on the beach.)

- Blasting or any other detonation activity (e.g., for channel deepening and/or widening, geotechnical surveys or exploration, bridge and structure removals, movies, military shows, or special events), excluding fireworks displays
- New or increased use of public recreational off-highway vehicle (OHV) trails;
- Resource extraction (e.g., mining, oil/gas, logging) or associated exploration activities.
- Dredging, in-stream gravel/sand mining, or removal of large wood;
- Activities that will alter streamflow, such as hydropower energy production, impoundments, intake structures, diversion structures, and/or turbines;
- Construction or development of a data center or related infrastructure (e.g., server farm, computer campus, technology campus, cloud infrastructure, digital infrastructure, IT operations center);
- Projects within 1000-ft buffer of the loggerhead sea turtle's current range that will include the addition of any permanent or temporary artificial lighting at night (sunset to sunrise) in the outdoor environment between May 1 and October 31 (sea turtle nesting and hatching season);
- Projects within 15-mi buffer of the loggerhead sea turtle's current range that will include the addition of >=1 acre of permanent or temporary artifical lighting at night (sunset to sunrise) between May 1 and October 31 (sea turtle nesting and hatching season);
- Solar energy development;
- Construction of a new communication tower that will exceed 200 feet above ground level in height and be supported with guy wires;
- Co-location of antennae on existing communication towers or other structures that will result in the increase of the tower height to more than 350 feet above ground level
- Communication tower projects that will not comply with the most current Federal Aviation Administration Obstruction Marking and Lighting Advisory Circular (AC 70/7460-1M).
- FEMA emergency response actions that have not yet been completed.

5 CONSERVATION MEASURES

This standing analysis applies conservation measures as design features of a project that avoid adverse effects on an individual, population, or species. The Service has found that certain conservation measures, while voluntarily adopted by action agencies, have reduced effects to the extent that the actions do not require formal consultation and the Service, and the action agency have found that actions are not likely to adversely affect species and/or Critical Habitat. Projects using this standing analysis to support NE or NLAA determinations must meet all the requirements of the standing analysis. If they commit to conservation measures as part of their project description, regardless of whether they are needed to conclude NLAA, such conservation measures are required as part of the action. If unable to adopt certain conservation measures, a project may not qualify to use this standing analysis. Additional conservation measures may be implemented as part of a federal action agency's program as part of section 7(a)(1). Below, we define '*conservation measures'* as conditions that must be met for NLAA or NE determinations, and '*conservation recommendations'* as additional design features that further support a species' conservation.

General Conservation Recommendations

- Conduct suitable habitat assessments for all species on the Official Species List and avoid impacts to suitable habitat and Designated Critical Habitats.
- If suitable habitat for listed species cannot be avoided, conduct presence/absence surveys in suitable habitat for listed species and submit a copy of the findings to the Georgia Ecological Services Field Office. This conservation recommendation is not required for all species. However, surveys documenting absence of listed species are helpful in determining that the species are unlikely to occur in the action area and thus in reaching a Not Likely to Adversely Affect determination for many projects.
- Projects should avoid land disturbance activities that may result in discharge of sediment into streams. If such activities occur, implement erosion and sedimentation control Best Management Practices in compliance with the Georgia Erosion and Sedimentation Control Act.
- Projects resulting in an increase in impervious surface should implement stormwater management Best Management Practices necessary to comply with water quality performance criteria in the Georgia Stormwater Management Manual.
- Avoid directly or indirectly impacting lands identified as permanently protected in the State's Conservation Lands database or lands located in priority corridors as identified in the State Wildlife Action Plan (SWAP) (Georgia DNR 2025). Development in or along the boundaries of these properties can cause habitat fragmentation that restricts animal movement and reduces population connectivity of at-risk or listed species and can interfere with conservation practices used to manage these species (e.g., prescribed fire).

Conservation Measures for Birds

5.1.1.1 Eastern Black Rail (*Laterallus jamaicensis ssp. jamaicensis*)

- The project shall not cause long-term or permanent damage, fragmentation, or conversion of suitable eastern black rail habitats.
- If the project will cause direct or indirect effects to suitable habitat for eastern black rail, conduct presence/absence surveys following the Eastern Black Rail Call-Response Survey Protocol for Range-wide Monitoring.

Conservation Recommendations:

- Schedule any project activities that will impact suitable habitat for outside of the nesting, brood rearing, and flightless molt periods ("sensitive time period", mid-March through September 30) where the species is detected or assumed to be present
- Manage invasive species (e.g., feral pigs, nutria, *Phragmites*) to benefit habitat and reduce predation risk

5.1.1.2 Shorebirds: Piping Plover (*Charadrius melodus*) and Rufa Red Knot (*Calidris canutus rufa*)

- Avoid any activities that may impact habitat within Georgia's coastal beaches, sandy north/south island ends, or associated dunes (e.g., artificial lighting, beach

nourishment, sand scraping, armoring, or other activities requiring heavy equipment on the beach

5.1.1.3 Red-cockaded Woodpecker (*Picoides borealis*)

- Avoid removal of suitable red-cockaded woodpecker foraging habitat. The 2003 Red-cockaded Woodpecker Recovery Plan Appendix 4. Survey Protocol defines red-cockaded woodpecker foraging habitat as pine or pine/hardwood stands in which 50 percent or more of the dominant trees are pines and the dominant pine trees are 30 years of age or older with an open understory
- Avoid impacts to areas with suitable red-cockaded woodpecker nesting habitat. Their nesting habitat is defined as pine or pine/hardwood stands that contain pines 60 years of age or older and an open understory.
- Ensure project impacts are greater than 0.5 mile away from suitable nesting habitat and red-cockaded woodpecker cavity trees. Note: Surveys should be conducted per the 2003 Red-cockaded Woodpecker Recovery Plan Appendix 4. Survey Protocol.
- Avoid removal or damage to red-cockaded woodpecker cavity tree(s). Damage can occur from via root compaction, soil compaction, removal of branches, trunk wounds, injury to bark, etc.
- Avoid disturbance within a cluster boundary during the nesting season. A cluster boundary is an aggregate of cavity trees and may include one to 20, or more, cavity trees on 3 to 60 acres. The average cluster is about 10 acres.
- Outside of the breeding season, avoid disturbance within a cluster boundary prior to one hour after sunrise and/or after one hour before sunset (*i.e.*, seismic activity, all-terrain vehicle and other off-road vehicle use, motorized equipment).
- Ensure an adequate amount of foraging habitat remains post-project. This will require conducting a foraging habitat analysis to determine whether enough foraging habitat remains for each red-cockaded woodpecker group under post-project conditions.

Conservation Measures for Reptiles and Amphibians

5.1.1.4 Eastern Indigo Snake (*Drymarchon couperi*)

- Comply with the USFWS Standard Protection Measures for the Eastern Indigo Snake or an alternative protection plan pre-approved by the Georgia Ecological Services Field Office.
- Entirely avoid impacts to gopher tortoises and their burrows because eastern indigo snakes use these burrows and their sandy aprons as wintering and breeding habitat, respectively. Maintain a minimum 15-ft buffer radius around gopher tortoise burrow entrances. However, a 50-ft buffer is preferred to ensure complete avoidance.
- Please note that gopher tortoises (GA Code § 391-4-10) and their burrows (GA Code § 27-1-30) are protected by state law. The Service recommends contacting and coordinating with the Georgia Department of Natural Resources - Environmental Review before beginning construction.
- If gopher tortoise burrows are to be impacted by the action, and the action area overlaps with the Eastern Indigo Snake conservation population units and known

occurrence buffer areas, a survey should be completed using the USFWS Eastern Indigo Snake Survey Protocol.

- If a Georgia Department of Transportation project is listed in the "Range wide Programmatic Biological Assessment of Effects Report for Eastern Indigo Snake, Gopher Tortoise, and Southeast Pocket Gopher on Roadway Maintenance and Safety Projects", the Special Provisions detailed in this document must be included in the project.

5.1.1.5 Sea Turtles Group: Green Sea Turtle (*Chelonia mydas*), Hawksbill Sea Turtle (*Eretmochelys imbricata*), Kemp's Ridley Sea Turtle (*Lepidochelys kempii*), Leatherback Sea Turtle (*Dermochelys coriacea*), and Loggerhead Sea Turtle (*Caretta caretta*)

- Avoid any activities that may impact habitat within Georgia's coastal beaches, sandy north/south island ends, or associated dunes (e.g., artificial lighting, beach nourishment, sand scraping, armoring, or other activities requiring heavy equipment on the beach)

Conservation Recommendations:

- If a project will include the permanent or temporary addition of artificial lighting at night (sunset to sunrise) through direct illumination or skyglow that may impact nesting habitat during the sea turtle nesting and hatching season (May 1 and October 31):
  a) Minimize the use of artificial lighting at night to meet minimum life safety requirements. Leave the lights off whenever possible.
  b) Minimize artificial lighting output (lumens) and illuminance (lux) to the greatest extent while meeting safety standards.
  c) Limit the spectral composition of artificial lighting to wavelengths longer than 560 nm.
  d) Lights should be installed using downward-facing fixtures and shielded to prevent spillover.
  e) Avoid use of flashlights or torches on the beach between sunset and sunrise.

5.1.1.6 Suwannee Alligator Snapping Turtle (*Macrochelys suwanniensis*)

- Maintain 50-ft minimum forested stream buffers around large streams and rivers to preserve water quality and nesting habitats for alligator snapping turtles.
- Project should avoid activities within 50-ft of large streams and rivers to preserve water quality and nesting habitats between April and August.
- In areas with potentially suitable habitat within the Action Area, the project should comply with all relevant performance standards in the Georgia's Erosion and Sedimentation Control Act and the Georgia Stormwater Management Manual, and the Metropolitan North Georgia Water Planning District model stream buffer protection ordinance (if applicable).

Conservation Recommendations:

- Have a biologist inspect in-stream microhabitat sites (*e.g.*, large woody debris, submerged logs, undercut roots) that turtles may use as structure to rest and forage prior to construction activities that would disturb these structures. If turtles are present, please contact the Georgia Ecological Services Field Office

(gaes_assistance@fws.gov; 706-613-9493) or Chris Coppola (christopher_coppola@fws.gov; 706-535-2120) to facilitate relocation activities.

5.1.1.7 Reticulated Flatwoods Salamander (*Ambystoma bishopi*) and Frosted Flatwoods Salamander (*Ambystoma cingulatum*)

- Avoid impacts to longleaf pine–wiregrass flatwoods or slash pine flatwoods.

Conservation Measures for Freshwater Aquatics Species Group (see Table 1 for species list)

- Implement erosion and sediment control and stormwater management BMPs in compliance with:
  - Georgia Stormwater Management Manual
  - Georgia's Erosion and Sedimentation Control Act
  - Metropolitan North Georgia Water Planning District Model Stream Buffer Protection Ordinance
- Maintain a protective undisturbed buffer of 300-ft from any perennial or intermittent streams, rivers, lakes, ponds, wet weather conveyances, wetlands, springs, or habitats that could be described as a wetland, bog, fen, stream, seep, or wet meadow.
- If the action requires in-water work, and suitable habitat for a federally listed freshwater aquatic species is present, conduct a survey to assess if the species occurs in the action area.
- If a project a) will result in increases in impervious surface ≥ 20 acres, b) will involve overall land disturbance ≥ 100 acres, or c) is located within 300-ft of any Designated Critical Habitat, please reach out directly to our office for technical assistance and consultation.

Conservation Measures for Plants Species Group (see Table 1 for species list)

- Conduct a survey for listed plant species with suitable habitat within the action area. A negative survey result is required for the NE determination.
- Placement of debris and/or staging areas should avoid areas where erosion risk and/or intact native plant assemblages are present.
- Care should be taken, when practicable, to minimize ground disturbance in previously undeveloped natural areas, including wetlands.
- If rare or protected plant species are known or suspected to occur on-site, it may be possible to rescue or translocate individuals or salvage impacted plants for scientific purposes. Please contact the Georgia Ecological Services Field Office (gaes_assistance@fws.gov; 706-613-9493) or Mincy Moffett (james_moffett@fws.gov; 706-997-7442) to coordinate salvage activities.
- Use orange barrier fence (or similar) to clearly mark suitable habitat to avoid during construction activities. Vegetation removal, mowing, and management of plants using mechanical devices within known populations of federally listed plants should be coordinated with the Georgia Ecological Services Field Office and Georgia Department of Natural Resources.

- Restoration, seeding, and/or replanting protected plants within suitable habitat should be coordinated with the Georgia Ecological Services Field Office and Georgia Department of Natural Resources and be in accordance with an approved management plan for the area or species.
- All materials, vehicles, machinery, and equipment used in project design and construction should be inspected for and/or be cleaned of invasive plant material before placement or use on a project site.
- All vehicles, machinery, and equipment will be clean and free from plant or animal materials before being transported to a new project site (unless this movement is related to moving fill or other materials to an appropriate offsite disposal location).

5.1.1.8 Additional Conservation Measure for the granite outcrop species: Little Amphianthus (*Amphianthus pusillus*), Black-Spored Quillwort (*Isoetes melanospora*), and Mat-forming Quillwort (*Isoetes tegetiformans*)

- Avoid using granite outcrops or exposed rock habitat for storage, parking, turnarounds, or other purposes for vehicles, machinery, and equipment.

Conservation Measures for Mammals

5.1.1.9 West Indian Manatee (*Trichechus manatus*)

- Projects involving dock or marina facilities should follow conditions in the Savannah District/FWS-GA Programmatic Manatee Agreement. Note: Recreational docks would apply conditions A through J. Community and commercial marinas would apply conditions A through P.
- Projects involving construction, modification, or maintenance of a public water access facility other than a dock or marina facility (e.g., public boat ramp, fishing pier) should comply with Manatee Special Permit Conditions A through M from the USACE Savannah District/FWS-GA Programmatic Manatee Agreement.
- Projects involving in-water construction or in-water activities other than dock, marina, or water access facilities (e.g., bulkhead construction or repair, riprap, bridge, dredging, mooring buoys) should comply with Manatee Special Permit Conditions A through K from the USACE Savannah District/FWS-GA Programmatic Manatee Agreement.

5.1.1.10 Gray Bat (*Myotis grisescens*)

- Ensure project impacts are greater than 0.5 mile away from a known cave or gray bat record
- If bridges, culverts, or abandoned buildings will be impacted by the project, please survey these structures prior to alteration and notify the Georgia Ecological Services Field Office if any bats are observed. Please submit relevant Bats in Bridges Form(s) or Roost Monitoring Form(s) via Survey 123.
- Complete environmental review with the Georgia Department of Natural Resources
- If the action will involve drilling or boring, complete a field survey for karst and other subterranean voids within the Action Area and ensure that any voids will not be impacted by the project.

- Implement erosion and sedimentation control and stormwater management Best Management Practices in compliance with the Georgia Erosion and Sedimentation Control Act and Georgia Stormwater Management Manual, when applicable (Table 2).

6 COVERED SPECIES AND CRITICAL HABITAT

This section includes a summary of relevant background information on the species and Critical Habitat(s) used to develop this standing analysis and covered by this key (see Table 1 for list of species). A complete description of the species can be found on ECOS (https://ecos.fws.gov). Survey recommendations can be found on the Georgia Biodiversity Portal (https://georgiabiodiversity.org/portal/). This overview is included to inform the reader of the species prior to the analysis of the effects of the action presented below. Species and Critical Habitats within a project's action area that may be affected by the proposed action, but are not covered by this standing analysis, will require individual consultation with the Georgia ESFO.

6.1 Birds

6.1.1.1 Eastern Black Rail (*Laterallus jamaicensis ssp. jamaicensis*)

The eastern black rail is a wetland dependent bird requiring emergent aquatic vegetation as dense overhead cover and soils that are moist to saturated (occasionally dry) and interspersed with or adjacent to very shallow water (typically ≤ 3 cm) to support its resource needs. Eastern black rails occur across an elevational gradient from lower and wetter portions of the marsh and to the contiguous uplands. Their location across this gradient may vary depending on hydrologic conditions. These habitat gradients have gentle slopes so that wetlands can have large areas of shallow inundation (sheet water). These wetlands can shrink and expand based on hydrologic conditions and thus provide dependable foraging habitat across the wetted areas and wetland upland transition zone for the subspecies. This species consumes invertebrates and seeds. Eastern black rails also require adjacent higher elevation areas (i.e., the wetland-upland transition zone) with dense cover to survive high water events due to the propensity of juvenile and adult black rails to walk and run rather than fly and chicks' inability to fly. The subspecies requires dense vegetative cover that allows movement underneath the canopy, and because birds are found in a variety of salt, brackish, and freshwater wetland habitats that can be tidally or non-tidally influenced, plant structure is considered more important than plant species composition in predicting habitat suitability. On the Georgia coast, habitat is high elevation areas of saltmarsh (high marsh) that are infrequently inundated by tides, very shallowly flooded freshwater marshes dominated by grasses and sedges, wet meadows, and flooded grassy fields. Saltmarsh habitat is dominated by cordgrass (*Spartina patens, S. alterniflora, S. bakeri*), saltgrass (*Distichlis spicata*), black needle rush (*Juncus roemerianus*), and occasionally glasswort (*Salicornia virginica*). Freshwater sites are dominated by grasses, rushes, and sedges. In terms of nest success, nests must be well hidden in a dense clump of vegetation over moist soil or shallow water to provide shelter from the elements and protection from predators. Flooding is a frequent cause of nest failure for eastern black rails; therefore, water levels must be lower than nests during egg-laying and incubation for nests to be successful. In addition, shallow pools that are 1-3 cm deep may be

the most optimal for foraging and for chick-rearing. For surveys, the Service recommends presence/absence surveys following the Eastern Black Rail Call-Response Survey Protocol for Range-wide Monitoring.

6.1.1.2 Red-cockaded Woodpecker (*Picoides borealis*)

The red-cockaded woodpecker (RCW) is a medium sized bird that lives in old-growth longleaf pine (*Pinus palustris*) with a mostly grassy understory. While other woodpeckers bore out cavities in dead trees where the wood is rotten and soft, the RCW is the only woodpecker species that excavates cavities exclusively in living pine trees. RCW often favor older pines that suffer from a fungus called red heart disease, which attacks the center of the trunk causing the inner wood, the heartwood, to become soft. Excavation of a cavity generally takes from 1 to 3 years. Cavity trees are used for nesting and roosting. Cavity trees being actively used by woodpeckers have numerous small resin wells which exude sap giving the tree a waxy candle appearance.

RCW's require open pine woodlands and savannahs with large mature pines for nesting and roosting, and foraging habitat. Longleaf, loblolly and shortleaf pine trees that are older (60 years or more) and have a minimum 10-inch diameter at breast height (dbh) are preferred cavity trees (nesting habitat). Nesting and roosting pine trees must be in open stands with little or no hardwood midstory and few or no overstory hardwoods.

6.1.1.3 Piping Plover (*Charadrius melodus*)

The piping plover is a small, stocky migratory shorebird endangered in the Great Lakes watershed and threatened in the remainder of its range (50 FR 50726, December 11, 1985).

Piping plovers forage on intertidal beaches, mudflats, sand flats, algal flats, and wash-over passes with no or very sparse emergent vegetation. They roost in unvegetated or sparsely vegetated areas, which may have debris, detritus, or micro-topographic relief offering refuge to plovers from high winds and cold weather. They also forage and roost in wrack (i.e., seaweed or other marine vegetation) deposited on beaches. In most areas, wintering piping plovers are dependent on a mosaic of sites distributed throughout the landscape, because the suitability of a particular site for foraging or roosting is dependent on local weather and tidal conditions. Plovers move among sites as environmental conditions change, and studies have indicated that they generally remain within a 2-mile area. Major threats to this species include the loss and degradation of habitat due to development, disturbance by humans and pets, and predation.

Piping plovers leave the breeding grounds and can arrive to the coast as early as July. A few birds may be present year-round, but sightings are rare in late May, June, and early July. Plovers move among sites as environmental conditions change, and studies have indicated that they generally remain within a 2-mile area. Winter habitats include beaches, mud flats, sand flats, algal flats, and washover passes (areas where breaks in the sand dunes result in an inlet). Individual plovers tend to return to the same wintering sites year after year. Wintering plovers rely on a diversity of habitat patches and move throughout the patches depending on weather and tidal conditions.

Twenty years of relatively steady population growth, driven by productivity gains, also evidences the efficacy of the ongoing Atlantic Coast piping plover recovery program. However, all the major threats (habitat loss and degradation, predation, human disturbance, and inadequacy of other

(non-ESA) regulatory mechanisms) identified in the 1986 ESA listing and 1996 revised recovery plan remain persistent and pervasive.

6.1.1.4 Critical Habitat for Piping Plover (*Charadrius melodus*)

The primary constituent elements for piping plover are found in geologically dynamic coastal areas that support intertidal beaches and flats (between annual low tide and annual high tide) and associated dune systems and flats above annual high tide. Specific primary constituent elements include:

(1) Intertidal sand beaches (including sand flats) or mud flats (between the MLLW and annual high tide) with no, or very sparse, emergent vegetation for feeding. In some cases, these flats may be covered or partially covered by a mat of blue-green algae.
(2) Unvegetated or sparsely vegetated sand, mud, or algal flats above annual high tide for roosting. Such sites may have debris or detritus and may have micro-topographic relief (less than 20 in (50 cm) above substrate surface) offering refuge from high winds and cold weather.
(3) Surf-cast algae for feeding.
(4) Sparsely vegetated backbeach, which is the beach area above mean high tide seaward of the dune line, or in cases where no dunes exist, seaward of a delineating feature such as a vegetation line, structure, or road. Backbeach is used by plovers for roosting and refuge during storms.
(5) Spits, especially sand, running into water used for foraging and roosting.
(6) Salterns, or bare sand flats in the center of mangrove ecosystems that are found above mean high water and are only irregularly flushed with sea water.
(7) Unvegetated washover areas with little or no topographic relief for feeding and roosting. Washover areas are formed and maintained by the action of hurricanes, storm surges, or other extreme wave actions.
(8) Natural conditions of sparse vegetation and little or no topographic relief mimicked in artificial habitat types (e.g., dredge spoil sites).

Georgia has 16 units of piping plover overwintering Critical Habitat within state boundaries.

6.1.1.5 Rufa Red Knot (*Calidris canutus rufa*)

The rufa red knot is a small shorebird. The rufa red knot breeds in the central Canadian arctic (June through mid-July) but can be found in Georgia during spring and fall migrations and the winter months, typically from September to February. Rufa red knot suitable habitat includes those coastal areas that support intertidal beaches and flats and associated dune systems and flats above annual high tide. Wintering suitable habitat include beaches, sand or mud flats or both with no or sparse emergent vegetation. Adjacent unvegetated or sparsely vegetated sand, mud, or algal flats above high tide are also important. Important components of the beach/dune ecosystem include surf-cast algae, sparsely vegetated back beach and salterns, spits, and washover areas. Washover areas are broad, unvegetated zones, with little or no topographic relief, that are formed and maintained by the action of hurricanes, storm surge, or other extreme wave action where breaks in the sand dunes result in an inlet. In addition, the wrack line is an important foraging and roosting element. Red knots feed on invertebrates, especially small clams, mussels, and snails, but also crustaceans, marine worms, and horseshoe crab eggs. On the breeding grounds, knots mainly eat insects. Spring migration is timed to coincide with the spawning season for the

horseshoe crab (*Limulus polyphemus*). Horseshoe crab eggs provide a rich, easily digestible food source for migrating birds.

6.1.1.6 Critical Habitat for Rufa Red Knot (*Calidris canutus rufa*)

Physical or biological features of proposed rufa red knot Critical Habitat include:

(1) Beaches and tidal flats used for foraging;
(2) Upper beach areas used for roosting, preening, resting, or sheltering;
(3) Ephemeral and/or dynamic coastal features used for foraging or roosting;
(4) Ocean vegetation deposits or surf-cast wrack used for foraging and roosting;
(5) Intertidal peat banks used for foraging and roosting;
(6) Features landward of the beach that support foraging or roosting; and,
(7) Artificial habitat mimicking natural conditions or maintaining the physical or biological features 1 to 6 (above).

6.2 Reptiles and Amphibians

6.2.1.1 Eastern Indigo Snake (*Drymarchon couperi*)

The Eastern indigo snake (*Drymarchon couperi*) is a diurnal species. They prefer upland habitat types (e.g. longleaf pine sandhills, scrub, pine flatwoods, tropical hardwood hammocks, and coastal dunes) but also uses a variety of lowland and human-altered habitats. They may move seasonally between upland and lowland habitats, especially in northern portions of their range. Throughout their range, eastern indigo snakes use below-ground shelter sites for refuge, breeding, feeding and nesting. They eat small mammals, anurans, snakes, and turtles. They depend on gopher tortoise burrows in xeric sandhill habitats throughout the northern portion of the species' range for overwintering shelter sites and rely on sandy substrates for egg incubation. Adult eastern indigo snakes move long distances and have very large home ranges; from several hundred to several thousand acres (tens to over a thousand hectares). On average home range sizes are larger for males and vary by season and latitude. Home ranges in the northern portion of the range are larger than in the southern portion. Eastern indigo snakes may live for 8 to 12 years in the wild, become sexually mature around 3.5 years of age and breed October through January. They consume a wide variety of animals, including other snakes.

6.2.1.2 Suwannee Alligator Snapping Turtle (*Macrochelys suwanniensis*)

Macrochelys spp. typically inhabit deeper waters, including large rivers, major tributaries, bayous, canals, swamps, lakes, ponds, and oxbows). Hatchlings and juveniles tend to occupy shallower water more often, whereas adults occupy shallower water in early summer and deeper depths in late summer and mid-winter, representing a thermoregulatory shift (Ernst and Lovich 2009). *Macrochelys spp*. are also associated with structure (e.g., tree root masses, stumps, submerged trees, etc.) and may occupy areas with a high percentage of canopy cover or undercut stream banks. *Macrochelys spp*. are opportunistic predators and foragers and consume a variety of foods. Fishes comprise a significant portion of the alligator snapping turtle's diet; however, crayfish, mollusks, smaller turtles, insects, nutria, snakes, birds, and vegetation (including acorns) have also been reported (Ernst and Lovich 2009).

No more than one clutch per year per female (average 27.8 eggs per clutch) has been observed in the wild, and they exhibit lower reproductive output than the smaller common snapping turtle (*Chelydra serpentina*). They do not appear to be particularly selective about nest sites, but nests have been observed across a range of distances - approximately 8 to 656 feet (2.5 to 200 meters) landward from the nearest water. Temperature of the nest site is important because this species also exhibits temperature-dependent sex determination, Type 2 – where more males are produced at intermediate incubation temperatures and more females are produced at the two extremes (Ernst and Lovich 2009). Nesting typically begins in April (Ernst and Lovich 2009; Carr et al. 2010) but has been observed as early as late March in *M. suwanniensis* (Carr et al. 2023). Incubation has been estimated to last 98 to 121 days, and emergence of hatchlings can last 0.5 to 22 days (Holcomb and Carr 2011).

6.2.1.3 Frosted (*Ambystoma cingulatum*) and Reticulated (*Ambystoma bishopi*) Flatwoods Salamanders

The frosted flatwoods salamander (*Ambystoma cingulatum*) and the reticulated flatwoods salamander (*Ambystoma bishopi*) are amphibians that reproduce by laying eggs in ponds or ephemeral wetlands in clusters of emergent aquatic vegetation or woody debris (Anderson and Williamson 1976; Palis 1995, 1997), where the eggs develop into aquatic-dwelling larva for 11-18 weeks. Larval flatwoods salamanders most likely prey on a variety of aquatic invertebrates and perhaps small vertebrates such as other amphibian larvae (Palis and Means 2005). In one study of larval food habits freshwater crustaceans dominated stomach contents of preserved, wild caught individuals from Florida and South Carolina (Whiles et al. 2004). The flatwood salamander larvae mature into terrestrial juveniles and adults (Palis 1995). As juveniles and adults, these salamanders live in intermediate-mesic pine-dominated flatwoods/savanna communities characterized by a 1- to 3-year summer fire interval. Juveniles and adults spend much of their time in burrows or root channels in these woodlands. Post-larval frosted and reticulated flatwoods salamanders eat small invertebrates that share their underground habit. When they reach sexual maturity flatwood salamanders return to their natal pond to breed during fall month (Petranka 1998).

6.2.1.4 Critical Habitat for Frosted and Reticulated Flatwoods Salamanders

For the reticulated flatwoods salamander, there are 8 units of Designated Critical Habitat, some of which are divided into subunits (for a total of 16 units and subunits). For the frosted flatwoods salamander, there are 6 units of Designated Critical Habitat, some of which are divided into subunits (for a total of 19 units and subunits).

The following are the primary constituent elements (PCEs) of the physical and biological features of the Critical Habitats:

(1) Breeding habitat. Small (generally less than 1 to 10 acres (ac) or less than 0.4 to 4.0 hectares (ha)), acidic, depressional standing bodies of fresh water (wetlands) that:
   (a) Are seasonally flooded by rainfall in late fall or early winter and dry in late spring or early summer;
   (b) Are geographically isolated from other water bodies;
   (c) Occur within pine flatwoods savanna communities;

(d) Are dominated by grasses and grass-like species in the ground layer and overstories of pond-cypress, blackgum, and slash pine;
(e) Have a relatively open canopy, necessary to maintain the herbaceous component that serves as cover for flatwoods salamander larvae and their aquatic invertebrate prey; and
(f) Typically have a burrowing crayfish fauna, but, due to periodic drying, the breeding ponds typically lack large, predatory fish (for example, *Lepomis* (sunfish), *Micropterus* (bass), *Amia calva* (bowfin)).

(2) Non-breeding habitat. Upland pine flatwoods-savanna habitat that is open, mesic woodland maintained by frequent fires and that:
(a) Is within 1,500 ft (457 m) of adjacent and accessible breeding ponds;
(b) Contains crayfish burrows or other underground habitat that the flatwoods salamander depends upon for food, shelter, and protection from the elements and predation;
(c) Has an organic hardpan in the soil profile, which inhibits subsurface water penetration and typically results in moist soils with water often at or near the surface under normal conditions; and
(d) Often have wiregrasses as the dominant grasses in abundant herbaceous ground cover, which supports the herbivorous invertebrates that serve as a food source for the flatwoods salamander.

(3) Dispersal habitat. Upland habitat areas between non-breeding and breeding habitat that allow for salamander movement between such sites and that is characterized by:
(a) A mix of vegetation types representing a transition between wetland and upland vegetation (ecotone);
(b) An open canopy and abundant native herbaceous species; and
(c) Moist soils as described in PCE 2; and (d) Subsurface structure, such as that created by deep litter cover or burrows, which provides shelter for salamanders during seasonal movements.

Special management of the PCEs for the frosted flatwoods salamander and the reticulated flatwoods salamander and their habitat may be required for the following threats: Direct and indirect impacts of land use conversions, primarily urban development and conversion to agriculture and pine plantations; stump removal and other soil-disturbing activities which destroy the belowground structure within forest soils; fire suppression and low fire frequencies; wetland destruction and degradation; and random effects of drought or floods. Specific details regarding these threats can be found in the proposed listing rule (62 FR 65787), the final listing rule (64 FR 15691), and 50 CFR Part 17.

Sea Turtles

The Service and the National Marine Fisheries Service (NMFS) are joint lead Federal agencies responsible for managing sea turtles; the Service manages the species on land, while NMFS manages the species in water. The information on this page displays mostly Service data for sea turtles in Georgia; for additional information on this species, including NMFS regulatory actions such as Critical Habitat designation or recovery planning, please visit the National Marine Fisheries website.

Five sea turtle species are known to occur in Georgia: the green sea turtle, hawksbill sea turtle, Kemp's ridley sea turtle, leatherback sea turtle, and loggerhead sea turtle.Hawksbill sea turtles are not known to nest in Georgia. Green sea turtles are considered infrequent nesters in Georgia. Less than 10 leatherback sea turtle nests are recorded in Georgia each year. Georgia averages 1,000 to 1,300 loggerhead sea turtle nests per year.In Georgia, female sea turtles emerge from the ocean and nest on beaches from May 1-August 31. Green, hawksbill, leatherback, and loggerhead sea turtles are solitary night-time nesters. Kemp's ridley sea turtles often nest during the day and in large groups. After about two months incubating in the warm sand, the eggs hatch and the hatchlings make their way to the water, typically between September 1-October 31. Hatchlings orient seaward by moving away from the darkest silhouette of the landward dune or vegetation to crawl towards the brightest horizon. On undeveloped beaches, this is toward the open horizon over the ocean. Primary stressors to nesting female sea turtles, eggs, and hatchlings arise from disturbance to nesting habitat in coastal beaches, sandy north/south islands ends, and/or associated dunes. One stressor to hatchling sea turtles is artificial light pollution that alters their ability to navigate as they make their way from the nest to the ocean using light cues from the moon.

6.2.1.5 Green Sea Turtle (*Chelonia mydas*)

Green sea turtles are considered infrequent nesters in Georgia. The life history of green turtles involves a series of stages of development from hatchling to adulthood. After emerging from the nest, hatchlings swim to offshore areas, where they live for several years in pelagic habitat. Juveniles eventually leave the open ocean habitat and travel to nearshore foraging grounds in shallow coastal habitats, where they mature to adulthood and spend the remainder of their lives. Adults migrate every 2 to 5 years from their coastal foraging areas to the waters off the nesting beaches where they originally hatched to reproduce.

Green turtles migrate hundreds to thousands of kilometers each way between their foraging grounds and nesting beaches. In the United States, the breeding season begins in late spring. Males mate with females on foraging grounds, along migratory pathways, and off nesting beaches. They are solitary, night-time nesters. Green turtles lay about 110 eggs per nest and will nest every 2 weeks for several months before leaving the nesting area and returning to their foraging grounds. Green turtles are the only herbivorous species of sea turtle. Their diet mainly consists of algae and seagrasses, though they may also forage on sponges, invertebrates, and discarded fish. Green turtles have been hunted for centuries for their meat and the gelatinous "calipee" that is made into soup. Hunting and egg gathering have reduced their number greatly.

6.2.1.6 Hawksbill Sea Turtle (*Eretmochelys imbricata*)

Hawksbill turtles are omnivorous (feeding on both plants and other animals), but their preferred food in many areas is sea sponges. They will also eat marine algae, corals, mollusks, tunicates, crustaceans, sea urchins, small fish, and jellyfish. The shape of their mouth and their sharp beaks enable them to reach into small holes and crevices in the reefs to find food.

Hawksbill turtles use a variety of habitats during different stages of their life cycle, but largely inhabit nearshore foraging grounds, especially healthy coral reef habitats. Upon leaving their nesting beaches, most hawksbill hatchlings enter pelagic (open sea) habitat, where they take shelter in floating algal mats and drift lines of flotsam and jetsam for approximately 1 to 5 years.

Eventually, juveniles migrate to shallower coastal feeding grounds, including their preferred coral reef habitats, where they mature to adulthood and spend the remainder of their lives. The ledges and caves of coral reefs provide shelter for resting hawksbills during the day and at night. Hawksbills are also found around rock formations, high energy shoals (sand bars in shallow water), and estuaries that provide good habitat for sponge growth.

Like other sea turtle species, hawksbills can migrate long distances between foraging areas and nesting beaches, however, they are not known to nest in Georgia. Every 1 to 5 years, female hawksbill turtles return to nest on beaches in the general areas where they hatched decades earlier. The nesting season varies by location, but in most places occurs between April and November of each year. Hawksbills typically nest at night on small and isolated "pocket" beaches, with little or no sand and a rocky approach. They usually nest high up on the beach under or in vegetation.

6.2.1.7 Kemp's Ridley Sea Turtle (*Lepidochelys kempii*)

Kemp's ridley sea turtles occasionally nest in Georgia. Kemp's ridley turtles, like all sea turtles, are marine reptiles and must come to the surface to breathe.

Adult female sea turtles return to land to lay their eggs in the sand. They are remarkable navigators and usually return to a beach in the general area where they hatched decades earlier. The Kemp's ridley engages in "arribada" nesting, where large groups of females gather offshore and come onto the beach to nest all at once and many nests subsequently hatch at the same time. They are the only sea turtles that routinely nest during the day.

After emerging from the nest, hatchlings enter the water and swim rapidly offshore. Some hatchlings remain in currents within the Gulf of Mexico while others may be swept out of the Gulf, around Florida, and into the Atlantic Ocean by the Gulf Stream. Juvenile Kemp's ridleys associate with floating Sargassum algae, using the Sargassum as an area of refuge, rest, and a place to feed on small animals and plants. This developmental drifting period lasts 1 to 2 years or until the turtle reaches a length of about 8 inches. After this oceanic phase, Kemp's ridleys migrate to nearshore areas of the Gulf of Mexico or northwestern Atlantic Ocean. After recruiting to shallow coastal areas, crabs are their preferred food; however, they also scavenge on discarded bycatch.

Depending on their breeding strategy, male Kemp's ridleys occupy many different areas within the Gulf of Mexico. Some males migrate annually between feeding and breeding grounds, yet others may not migrate at all, mating with females encountered at their feeding grounds or near nesting beaches. Female Kemp's ridleys have been tracked migrating to and from nesting beaches in Mexico and south Texas. Females leave breeding and nesting areas and migrate to foraging areas ranging from the Yucatán Peninsula to southern Florida to the north-central Gulf of Mexico. Some females take up residence in specific foraging grounds for months at a time and return to the same foraging grounds in subsequent years.

6.2.1.8 Leatherback Sea Turtle (*Dermochelys coriacea*)

Leatherback sea turtles undertake the longest migrations between breeding and feeding areas of any sea turtle, averaging 3,700 miles each way. Leatherbacks can dive to depths of approximately 4,000 feet and can stay down for up to 85 minutes. They eat soft-bodied open ocean prey such as

jellyfish and salps. Leatherbacks spend most of their lives in the ocean, but females leave the water to lay eggs.

Leatherbacks nest several times during a nesting season, typically at 8- to 12-day intervals and lay clutches of approximately 100 eggs. The eggs incubate approximately two months before leatherback hatchlings emerge from the nest. Less than 10 leatherback nests are recorded in Georgia each year.

6.2.1.9 Loggerhead Sea Turtle (*Caretta caretta*)

Loggerhead hatchlings and juveniles spend the first 7 to 15 years of their lives in the open ocean. Then they migrate to nearshore coastal areas where they will forage and continue to grow for several more years. Adult loggerhead turtles migrate hundreds to thousands of kilometers from their foraging grounds to their nesting beaches.

Loggerheads are carnivores, only occasionally consuming plant material. During their open ocean phase, they feed on a wide variety of floating items. Juveniles and adults in coastal waters eat mostly bottom dwelling invertebrates such as whelks, other mollusks, horseshoe crabs, and other crabs.

Loggerhead sea turtles are long-lived and could live 70 to 80 years or more. Female loggerheads reach maturity at about 35 years of age. Every 2 to 3 years they mate in coastal waters and return to nest on a beach in the general area where they hatched decades earlier. Georgia averages 1,000 to 1,300 nests per year.

In the northern hemisphere, mating occurs in late March to early June, and females lay eggs between late April and early September. Loggerheads are solitary, night-time nesters, and they generally prefer high energy, relatively narrow, steeply sloped, coarse-grained beaches for nesting. Adult females lay three to five nests, sometimes more, two weeks apart during a single nesting season. Each nest contains about 100 eggs. The sex of hatchlings is determined by the temperature of the sand—cooler temperatures produce males and warmer temperatures produce females.

6.2.1.10 Critical Habitat for Loggerhead Sea Turtle (*Caretta caretta*)

Primary constituent elements of Critical Habitat for loggerhead sea turtles include:

(1) Suitable nesting beach habitat that has (a) relatively unimpeded nearshore access from the ocean to the beach for nesting females and from the beach to the ocean for both post-nesting females and hatchlings and (b) is located above mean high water to avoid being inundated frequently by high tides.
(2) Sand that (a) allows for suitable nest construction, (b) is suitable for facilitating gas diffusion conducive to embryo development, and (c) can develop and maintain temperatures and a moisture content conducive to embryo development.
(3) Suitable nesting beach habitat with sufficient darkness to ensure nesting turtles are not deterred from emerging onto the beach and hatchlings and post-nesting females orient to the sea.
(4) Natural coastal processes or artificially created or maintained habitat mimicking natural conditions. This includes artificial habitat types that mimic the natural conditions described in

PCEs 1 to 3 above for beach access, nest site selection, nest construction, egg deposition and incubation, and hatchling emergence and movement to the sea. Habitat modification and loss occurs with beach stabilization activities that prevent the natural transfer and erosion and accretion of sediments along the ocean shoreline. Beach stabilization efforts that may impact loggerhead nesting include beach nourishment, beach maintenance, sediment dredging and disposal, inlet channelization, and construction of jetties and other hard structures. However, when sand placement activities result in beach habitat that mimics the natural beach habitat conditions, impacts to sea turtle nesting habitat are minimized.

The physical or biological features of the loggerhead sea turtle Critical Habitat include:

(1) Sites for Breeding, Reproduction, or Rearing (or Development) of Offspring; and
(2) Habitats protected from disturbance or representative of the historical, geographic, and ecological distributions of the species.

The primary stressors to loggerhead sea turtle habitat include: recreational beach use; beach driving; predation; beach sand placement activities; in-water and shoreline alterations; coastal development; lights on land or in the adjacent water, including skyglow and bonfires, particularly artificial lighting that has an unshielded lamp and a short wave length (below 540 nm); habitat obstructions (tree stumps, fallen trees, and other debris on the beach; nearshore sand bars; and ponding along beachfront seaward of dry beach); human-caused disasters and response to natural and human-caused disasters military testing and training activities.

6.3 Freshwater Aquatics

Fishes

The fish species discussed, including the amber darter, blue shiner, Cherokee darter, Conasauga logperch, Etowah darter, frecklebelly madtom, goldline darter, and trispot darter, typically inhabit freshwater streams and prefer clean, well-oxygenated waters with minimal siltation and abundant rocky substrates such as gravel and cobble. Often found in riffles, runs, and pools with moderate to swift currents, they forage on various aquatic invertebrates, including mayflies and midges.

Critical Habitats include high-quality water, stable stream morphology, and connectivity between suitable habitats that support their life cycles. Ecological threats such as urbanization, pollution, habitat alteration, and impoundment significantly impact these fish populations. Overall, the successful conservation of these species hinges on maintaining optimal water quality, preventing habitat degradation, and ensuring adequate flows and connectivity within their ecosystems.

6.3.1.1 Amber Darter (*Percina antesella*)

The amber darter is a small fish that lives in the Etowah and Conasauga Rivers of Georgia and Tennessee. It has a slender body reaching up to 3 inches long with a moderately long and pointed snout and a distinct vertical bar (or tear drop) below the eye. Amber darters are brownish in color with four dark saddles across its body when seen from above (dorsal) and a white or yellowish lower side (ventral). The saddles are believed to help darters blend into a rocky streambed, resembling the light and shadows cast over small stones. Amber darters are known to occupy

shallow, fast-moving riffles and runs of the Conasauga River mainstem, and the mainstem and certain large tributaries of the Etowah River above Lake Allatoona. They like to forage along the streambed for snails, limpets, and aquatic insects.

6.3.1.2 Critical Habitat for Amber Darter (*Percina antesella*)

Physical or biological features for amber darter Critical Habitat include:

(1) High quality water;
(2) Riffle areas (free of silt) composed of sand, gravel, and cobble, which becomes vegetated primarily with *Podostemum* during the summer.

Activities which do or could occur in the upper Conasauga River basin and could impact the Critical Habitat include logging, land use changes, construction of impoundments (in particular, a reservoir on the Conasauga River), stream alterations, bridge and road construction, logging, and discharges of municipal and industrial wastes. These activities, along with others that alter the watershed, could, if not constructed with the protection of the species in mind, degrade the water and substrate quality of the upper Conasauga River basin by increasing siltation, water temperatures, organic pollutants, and extremes in water flow.

6.3.1.3 Blue Shiner (*Cyprinella caerulea*)

Blue shiners have an extended spawning period from May to August. Eggs are deposited in silt free areas in rock crevices, or possibly crevices in woody debris, in habitats with moderate current. Life history studies on the blue shiner revealed that most individuals were sexually mature in the third summer of life, and some were in their fourth. Blue shiners can be seen foraging in flowing water in midwater. Blue shiners consume aquatic and terrestrial insects captured from stream drift. The preferred habitat of blue shiners consists of small to medium streams that include rocky substrates. Fish are found in riffles and runs, as well as pools with moderate to swift current, over gravel to cobble or boulder substrate.

6.3.1.4 Cherokee Darter (*Etheostoma scotti*)

The Cherokee darter is endemic to the Etowah River system in north Georgia and, historically, is thought to have occurred in most of the watershed's tributaries (USFWS 2000). Currently, the species exhibits a disjunct and discontinuous distribution pattern, associated to a large degree with construction of the Allatoona Reservoir in the middle Etowah River system. Most Cherokee darter populations occur upstream of Lake Allatoona in tributaries of the Etowah River that drain the Piedmont physiographic province. Populations downstream of Allatoona Dam are geographically and genetically isolated from other populations in the Etowah River basin. These southern tributary systems tend to drain areas exhibiting less relief and, on average, are much more degraded than streams above the Reservoir (USFWS 1994b). Recent studies have identified three genetically distinct Cherokee darter evolutionarily significant units (ESUs). Two are in the watershed above Lake Allatoona, and the third is downstream of the lake.

Cherokee darters usually are found in shallow water (e.g., 4 - 20 inches) and in sections of reduced current, typically in runs and glides and at the ecotones of riffles and backwaters (Bauer et al. 1995). The species generally does not occur in the Etowah River. although the mainstem may provide marginal habitat that allows movement between streams and genetic exchange between some populations (B.J. Freeman, UGA, pers. comm. 1998). The Cherokee darter is associated with

large gravel, cobble. and small boulder substrates but is uncommonly or rarely found over extensive areas of bedrock. fine gravel, or sand. It is most abundant in sections of smaller streams with relatively clear water and clean substrates with little silt deposition. The Cherokee darter is relatively intolerant of moderate to heavy silt deposition and to impoundment (Bauer et al. 1995). The life history of the Cherokee darter has not been studied. However, research on other members of the darter subgenus *Ulocentra*, in which this species is placed, provide general life history information that may pertain to the Cherokee darter. Spawning takes place in the spring. *Ulocentra* darters generally display some sort of courtship behavior (e.g., flashing colorful fins, posturing) before the female deposits eggs separately on the side or under a large rock. After fertilization, the male may defend the eggs. which generally number in the low hundreds. Sexual maturity usually is reached after the first year of a typically three-year life span. Like most darters, *Ulocentra* usually eat a variety of insect larvae, particularly midges and black flies, and microcrustaceans.

6.3.1.5 Conasauga Logperch (*Percina jenkinsi*)

The Conasauga logperch is a large darter that reaches up to 5.25 inches in length (133 mm). It most often is encountered in deep gravel runs or pools with small stones and sandy bottoms (Etnier and Starnes 1993). Even within suitable habitat, the darter is rare, typically observed at low densities of scattered individuals or pairs (Rakes and Shute 2005). Captive mortality in Conasauga logperch suggests maximum lifespan is at least five years (Petty et al. 2015). Logperch feed on aquatic insect larvae – the fish has a fleshy, pig-like snout, which it uses to flip stones to expose prey (Freeman 1999). Spawning behavior and details of spawning season conditions are unknown.

6.3.1.6 Critical Habitat for Conasauga Logperch (*Percina jenkinsi*)

Physical or biological features for Conasauga logperch Critical Habitat include:

(1) High quality water;
(2) Pool areas with flowing water;
(3) Silt free riffles with gravel and rubble substrate; and
(4) Fast riffle areas and deeper chutes with gravel and small rubble.

Activities which do or could occur in the upper Conasauga River basin and could impact the Critical Habitat include logging, land use changes, construction of impoundments (in particular, a reservoir on the Conasauga River), stream alterations, bridge and road construction, logging, and discharges of municipal and industrial wastes. These activities, along with others that alter the watershed, could, if not constructed with the protection of the species in mind, degrade the water and substrate quality of the upper Conasauga River basin by increasing siltation, water temperatures, organic pollutants, and extremes in water flow.

6.3.1.7 Etowah Darter (*Etheostoma etowahae*)

The life history of the Etowah darter has not been determined, but a similar species, the greenbreast darter, is known to spawn in the spring in sand and gravel riffles. Rakes and Shute (2005) noted that captively-bred Etowah darter eggs were about 0.1-inch in diameter with a relatively tough chorion (outer membrane) and were laid in small, loosely adhesive clumps buried under sand or in substrate interstices. The egg clumps tend to remain at the site where laid unless dislodged by flood or physical disturbance (Pat Rakes, Conservation Fisheries, Inc., pers. comm., 2006). At hatching, yolk-sac larvae are around 0.2-inches long; they swim in 2 or 3 days, when they

are about 0.25-inches long and less than 0.02-inches wide. The pelagic larvae are attracted to light when they first swim up, drifting at or near the surface of the river. Distance downstream the larvae move with the current after hatching is influenced by discharge, flow velocity, amount of large woody debris that creates eddies, and other factors. Preferred habitat of the larvae after swim-up is unknown, but observations of Etowah darters in captivity and information on other pelagic darter larvae suggest Etowah darter larvae inhabit relatively deep water (>1 ft) in gently flowing pools, often in an eddy below woody debris or a boulder. They maintain position in these places, swimming into the current, and feeding on drifting food particles/zooplankton.

In captivity, Etowah darter larvae transformed to the benthic juvenile stage at 2 weeks old, when they were about 0.4-inches long (Rakes and Shute 2005, Pat Rakes, Conservation Fisheries, Inc., pers. comm., 2006). As juveniles grow, they move upstream to suitable shoal habitat (Byron Freeman, University of Georgia, pers. comm., August 2006). Sexual maturity is usually reached after the first year of a typically three-year life span. The greenbreast darter, and likely the Etowah darter, consumes midge larvae, mayflies, water mites, caddisflies, and occasionally some mollusks (Mettee et al. 1996).

6.3.1.8 Frecklebelly Madtom (*Noturus munitus*)

Frecklebelly madtom is a nocturnal catfish generally found in swift-flowing waters above gravel shoal habitat in large and medium-sized rivers. Seasonal differences in sex ratios suggested that males likely moved to more difficult to sample habitat in pools to create and defend nests, while females remain more evenly dispersed among a variety of habitats (Bennett et al. 2010; Burr and Stoeckel 1999; Clugston and Cooper 1960). Frecklebelly madtom prey upon mayfly nymphs, caddisfly larvae, blackfly larvae, and midges. Nesting biology and habitat has yet to be determined for frecklebelly madtoms, although data could potentially be inferred from closely related taxa.

Reproduction is thought to occur between June and July (Trauth et al. 1981). The female produces 50-70 eggs, which are released all at one time (Trauth et al. 1981). The frecklebelly madtom is reproductively mature in the second summer after birth, similar to other madtom species (Burr and Stoeckel 1999). Nesting sites for madtoms are typically cavities under natural material (rocks, logs, empty mussel shells) or human litter (inside cans or bottles, under boards). Madtoms construct cavities on the bottoms of streams by moving substrate using their heads to push gravel, or their mouths to carry gravel and pebble (USFWS 2020). Both males and females may construct nesting cavities (Burr and Stoeckel 1999). A single male guards nests in least, elegant, smoky, and potentially frecklebelly madtoms (Mayden and Walsh 1984; Dinkins and Shute 1996). Guardian males have empty stomachs, suggesting that they do not feed during nest guarding, which can last as long as 3 weeks (Dinkins and Shute 1996). The frecklebelly madtom occurs within the states of Alabama, Georgia, Louisiana, Mississippi, and Tennessee.

6.3.1.9 Critical Habitat for Frecklebelly Madtom (*Noturus munitus*)

Physical or biological features of frecklebelly madtom Critical Habitat include:

(1) Geomorphically stable, medium to large streams with:
   (a) Stable stream channels that maintain lateral dimensions, longitudinal profiles, and sinuosity patterns over time without an aggrading or degrading bed elevation; and

(b) Banks with intact riparian cover to maintain stream morphology and reduce erosion and sediment inputs.

(2) Connected instream habitats that:
   (a) Include stable riffle-run pool complexes;
   (b) Have abundant cobble, boulders, and woody structures, or other suitable cover used for nesting and river weed (*Podostemum* spp.) that is free of silt.

(3) Adequate flows, or a hydrologic flow regime (which includes the severity, frequency, duration, and seasonality of discharge over time), necessary to maintain instream habitats and to maintain connectivity of streams with the floodplain, allowing the exchange of nutrients and sediment for maintenance of the fish's habitat, food availability, and ample oxygenated flow for spawning and nesting habitat.

(4) Appropriate water and sediment quality (including, but not limited to, conductivity; hardness; turbidity; temperature; pH; ammonia; heavy metals; pesticides; animal waste products; and nitrogen, phosphorus, and potassium fertilizers) necessary to sustain natural physiological processes for normal behavior, growth, and viability of all life stages.

(5) Diversity and availability of aquatic macroinvertebrate prey items, which include larval midges, mayflies, caddisflies, dragonflies, and beetles.

6.3.1.10 Goldline Darter (*Percina aurolineata*)

Goldline darters occupy medium-sized rivers and large tributary streams. Their preferred habitat comprises riffles and runs with swift current over gravel, cobble, bedrock and boulder substrate, often with patches of sand and riverweed (*Podostemum ceratophyllum*) (Freeman and Hagler 2009; Albanese et al., 2014). Benthic macrophytes like the American water-willow (*Justicia americana*) and riverweed that are components of high-quality shoal habitat have been declining over the past few decades (Argentina et al. 2010; Wood and Freeman 2017; Davis et al. 2018; Freeman and Freeman 2019). Modeling the distribution and status of suitable habitat throughout the goldline darter's range would aid in prioritizing preservation and restoration of its occupied and potential habitat. Models used to assess the status of the species in Georgia suggest a high probability of suitable habitat within the mainstem upper Coosawattee River and large tributaries upstream of Carters Lake (Albanese et al. 2014). No such analysis has been conducted for the Cahaba River population, which occurs in the Ridge and Valley ecoregion of Alabama. Studies are needed to determine if habitat requirements of the species are equivalent between ecoregions and the extent of suitable habitat in the Cahaba River system.

6.3.1.11 Critical Habitat for Goldline Darter (*Percina aurolineata*)

The goldline darter is in Coosawattee Rivers of the Mobile Basin. In the Coosawattee drainage in northwest Georgia, it is known from the main channel of the river above Coosawattee Falls in Gilmer County. The goldline darter's typical habitat is gravel tiers and shoals in the river proper, i.e., not its tributaries. The goldline darter is threatened in the Cahaba by pollution from domestic, industrial waste and acid drainage from strip mining. Historically, large volume of water released into the Cahaba, as well as strip mine runoff, greatly degraded the water quality.

6.3.1.12 Trispot Darter (*Etheostoma trisella*)

Trispot darter utilizes distinct breeding and non-breeding habitats (Ryon 1981 and 1986). Approximately from April to October, the species inhabits its non-breeding habitat which consists

of small to medium river margins and lower reaches of tributaries with slower velocities (estimated to be 0.7 - 1 foot/second, 0.2 – 0.3 m/second) and is associated with detritus, logs, and stands of water willow though vegetation and detritus have not been found to be essential. The substrate consists of small cobbles, pebbles, gravel, and often a fine layer of silt. The predominate food item while in their non-breeding habitat was found to be non-biting midges (Chironomidae) larvae and pupae (70%) followed by mayflies (Ephemeroptera) nymphs (Ryon 1986). Trispot darters occupy water depths ranging from 4 - 30 inches (10 - 75 cm). Water temperatures in non-breeding habitat generally range from 57 - 80° F (14 - 27° C) (May - July) and reduce to 60° F (16° C) in October. During low flow periods, the darters move away from the peripheral zones and toward the main channel; edges of water willow beds, riffles, and pools; and mouths of tributaries.

In late fall this migratory species shifts its habitat preference and movement toward spawning areas begins; this movement may be queued by temperature change, precipitation, and/or decreasing daylight hours (Ryon 1981), with rainfall being the most likely trigger (Ryon 1981). The fish move from the main channels into tributaries and eventually reach adjacent seepage areas where they will congregate and remain from approximately late November or early December to late April. Breeding habitat becomes available as precipitation increases and the water table rises. The transition zone between breeding and non-breeding habitats was described by Ryon (ibid) to be a low gradient stream mostly comprised of long pools with woody debris and clay substrate base overlayed with silt and sand. Non-biting midges (Chironomidae) were also found to be the dominate prey item while in breeding areas, followed by mayflies (Ephemeroptera) nymphs (Ryon 1986). Breeding sites have been defined as intermittent to partially intermittent seepage areas and ditches with little to no flow; shallow depths (12 inches, 30 cm or less); moderate leaf litter covering mixed cobble, gravel, sand, and clay; a deep layer of soft silt over clay; and emergent vegetation (both aquatic and terrestrial species) (Ryon 1981 and 1986; O'Neil et al. 2009). The temperature of the spawning areas likely remains relatively constant during the breeding period (53 to 59° F, 12 to 15° C) (Ryon 1981). During their spawning period the trispot darter requires seasonally wet tributaries and seeps that become available and connected to their non-breeding habitat through precipitation and a rise in the water table. This darter species spawns during winter months (January - March). Trispot darters have adhesive eggs that attach to vegetation or rocky substrates and once laid, the eggs are abandoned. The eggs have an incubation period of approximately 30 days at 53° F (12° C). Development from egg to larvae is 41 days (Ryon 1981).

6.3.1.13 Critical Habitat for Trispot Darter (*Etheostoma trisella*)

Physical or biological features of trispot darter Critical Habitat include:

(1) Geomorphically stable, small to medium streams with detritus, woody debris, and stands of water willow (*Justicia americana*) over stream substrate that consists of small cobble, pebbles, gravel, and fine layers of silt; and intact riparian cover to maintain stream morphology and reduce erosion and sediment inputs.
(2) Adequate seasonal water flows, or a hydrologic flow regime (which includes the severity, frequency, duration, and seasonality of discharge over time) necessary to maintain appropriate benthic habitats and to maintain and create connectivity between permanently flowing streams with associated streams that hold water from November through April, providing connectivity between the darter's spawning and summer areas.

(3) Water and sediment quality (including, but not limited to, conductivity; hardness; turbidity; temperature; pH; ammonia; heavy metals; pesticides; animal waste products; and nitrogen, phosphorus, and potassium fertilizers) necessary to sustain natural physiological processes for normal behavior, growth, and viability of all life stages.
(4) Prey base of aquatic macroinvertebrates.

The features essential to the conservation of the trispot darter may require special management considerations or protections to reduce the following threats: (1) Urbanization of the landscape, including (but not limited to) land conversion for urban and commercial use, infrastructure (roads, bridges, utilities), and urban water uses (water supply reservoirs, wastewater treatment); (2) nutrient pollution from agricultural activities that impact water quantity and quality; (3) significant alteration of water quality; (4) improper forest management or silviculture activities that remove large areas of forested wetlands and riparian systems; (5) culvert and pipe installation that creates barriers to movement; (6) changes and shifts in seasonal precipitation patterns; (7) other watershed and floodplain disturbances that release sediments or nutrients into the water or fill suitable spawning habitat; and (8) creation of reservoirs that convert permanently flowing streams and/or streams that hold water from November through April into lake or pond-like (lentic) environments.

Mussels

There are 15 species of mussels included in this analysis. Native freshwater mussels typically need clean, free-flowing water and sufficient food sources. These mussels require adequate water quality (including temperature, turbidity, dissolved oxygen, and chemical constituents) that meets or exceeds the current aquatic life criteria established under the Clean Water Act, as amended (33 U.S.C. 1251 et seq.), and permanently flowing water. Suitable habitat also includes geomorphically stable stream channel (a channel that maintains its lateral dimensions, longitudinal profile, and spatial pattern over time without a consistent aggrading or degrading bed elevation) and predominantly sand, gravel, and/or cobble stream substrate with low to moderate amounts of silt and clay. Freshwater mussels gather nutrients and food, such as detritus, plankton, and other microorganisms, by filter feeding. Adult mussels are sedentary. Mussel reproduction requires a stable, undisturbed habitat and a sufficient population of fish hosts to complete a mussel's glochidia development. The timing of breeding varies by species. Juvenile mussels may be particularly sensitive to water quality degradation or toxins, although all mussels are negatively impacted by pollution and degradation of the aquatic ecosystem. Species river reaches with mussel occurrence records are represented by the current species-specific area of influence in the DKey.

6.3.1.14 Alabama Moccasinshell (*Medionidus acutissimus*)
The Alabama moccasinshell is a small, delicate species, measuring up to 55 mm in length (Williams et al. 2008). The shell is narrowly elliptical, and thin, with a well-developed acute posterior ridge that terminates in an acute point on the posterior ventral margin. The posterior slope is finely corrugated. The periostracum is yellow to brownish yellow, with broken green rays across the entire surface of the shell. The thin nacre is translucent along the margins and salmon-colored in the umbos (beak cavity) (68 FR 14752). The Alabama moccasinshell typically occupies

sand, gravel or cobble shoals, with moderate to strong currents, in streams and small rivers. The Alabama moccasinshell spends most of its time buried in the sediment, although gravid females, meaning carrying eggs, have been alleged to emerge from the sediment to display a modified mantle margin. Female Alabama moccasinshell are gravid from October to June. They migrate to the surface of the river bottom between March and June and have a black mantle lure which may be used to attract fish hosts to gravid females. Successful fish hosts for the Alabama moccasinshell include one species of topminnow and several darter species. The species historical range included Alabama, Georgia, Mississippi.

6.3.1.15 Altamaha Spinymussel (*Elliptio spinosa*)

The Altamaha spinymussel is a freshwater mussel found only in Georgia's Altamaha River and its major tributaries. Their shells are sub-triangular and moderately inflated in shape, shiny and smooth in texture except for their spines. Young spinymussels have greenish-yellow shells with faint green rays. As they grow older, their shell darkens to deep brown. The nacre (or interior of the shell) is pink or purple in color. The Altamaha spinymussel is endemic to the Altamaha River basin. These mussels are found most often in very coarse to fine sand, although they sometimes occur in sloughs that form between an exposed sandbar and the bank. Adults are not as sessile or sedentary as most freshwater mussels. They apparently move about their sandbar habitat but are often found buried 2 to 4 inches below the sandbar surface. The mussel's large spines are presumably used to anchor it to the shifting sand of sandbars within swift-flowing rivers. The host fish of the Altamaha spinymussel is currently unknown.

6.3.1.16 Critical Habitat for Altamaha Spinymussel (*Elliptio spinosa*)

The physical or biological features of the Altamaha spinymussel Critical Habitat include:

(1) Geomorphically stable river channels and banks (channels that maintain lateral dimensions, longitudinal profiles, and sinuosity patterns over time without an aggrading or degrading bed elevation) with stable sandbar, slough, and mid-channel island habitats of coarse-to-fine sand substrates with low to moderate amounts of fine sediment and attached filamentous algae.
(2) A hydrologic flow regime (the magnitude, frequency, duration, and seasonality of discharge over time) necessary to maintain benthic habitats where the species are found and to maintain connectivity of rivers with the floodplain, allowing the exchange of nutrients and sediment for sand bar maintenance, food availability, and spawning habitat for native fishes.
(3) Water quality necessary for normal behavior, growth, and viability of all life stages, including specifically temperature (less than 32.6 °C (90.68 °F) with less than 2 °C (3.6 °F) daily fluctuation)), pH (6.1 to 7.7), oxygen content (daily average DO concentration of 5.0 mg/l and a minimum of 4.0 mg/ l), an ammonia level not exceeding 1.5 mg N/L, 0.22 mg N/L (normalized to pH 8 and 25 °C (77 °F)), and other chemical characteristics.
(4) The presence of fish hosts (currently unknown) is necessary for recruitment of the Altamaha spinymussel. The continued occurrence of diverse native fish assemblages currently occurring in the basin will serve as an indication of host fish presence until appropriate host fishes can be identified for the Altamaha spinymussel.

The Altamaha spinymussel lives within a large river drainage exposed to a variety of landscape uses. Habitat and water quality for the Altamaha spinymussel face degradation from several

sources. Primary among these are threats from sedimentation and contaminants within the streams that the spinymussel inhabits.

6.3.1.17 Coosa Moccasinshell (*Medionidus parvulus*)
The Coosa moccasinshell is a small species measuring up to 58 mm in length (Williams et al. 2008). The shell is thin and fragile, elongate and elliptical to rhomboidal in outline. The posterior ridge is inflated and smoothly rounded, terminating in a broadly rounded point; the posterior slope is finely corrugated. The periostracum is yellow brown to dark brown and has fine green rays. The nacre is blue, occasionally with salmon-colored spots (68 FR 14752). The Coosa moccasinshell is believed to be a long-term brooder, gravid from October to June. The Coosa moccasinshell typically occupies sand, gravel or cobble shoals with moderate to strong currents in streams and small rivers. The Coosa moccasinshell is believed to behave similarly to the Alabama moccasinshell, spending most of the time buried in the sediment, emerging only to display the female's modified mantle lure.

6.3.1.18 Fat Threeridge (*Amblema neislerii*)
The fat threeridge is a medium-sized freshwater mussel that can grow to be four inches long (10.2 centimeters). This species has a dark brown to black outer shell with seven to nine horizontal ridges and a bluish white to light purple inner shell. The left valve of the fat threeridge has two equal-sized teeth, and the right valve has a larger and smaller tooth. The preferred host fish are different types of minnows and different species in the sunfish family. The fat threeridge inhabits slow to moderate current rivers with sand, gravel, and rocky rubble floors. Critical Habitat for the Fat Threeridge (*Amblema neislerii*) is summarized in Critical Habitat for Four Northeast Gulf Drainages.

6.3.1.19 Finelined Pocketbook (*Hamiota altilis*)
The finelined pocketbook is suboval in shape and can grow to 117 mm in length (Williams et al. 2008). It is yellow brown to blackish and occurs in small creeks to large rivers. It has been found in sand, gravel, and gravel-cobble substrates without heavy silt deposits (Williams et al. 2008). The ventral margin of the shell is angled posteriorly in females, resulting in a pointed posterior margin. The periostracum is yellow brown to blackish and has fine rays on the posterior half. The nacre is white, becoming iridescent posteriorly. Females are known to brood glochidia from late summer through late spring and release superconglutinates during this time. Glochidia of this species successfully transformed on Largemouth Bass (*Micropterus salmoides*), Spotted Bass (*M. punctatus*), Coosa Bass (*M. coosae*), and Green Sunfish (*Lepomis cyanellus*) (Haag et al. 1995). The species historical range included Alabama and Georgia. Critical Habitat for the Finelined Pocketbook (*Hamiota altilis*) is summarized in Critical Habitat for Mobile River Basin Mussels.

6.3.1.20 Georgia Pigtoe (*Pleurobema hanleyianum*)
The shell of the adult Georgia pigtoe reaches about 50 to 65 millimeters (mm) (2 to 2.5 inches (in)) in length. It is oval to elliptical and somewhat inflated. The posterior ridge is low and evenly rounded when evident. The anterior end is rounded, while the posterior margin is bluntly pointed below. Dorsal and ventral margins are curved, and the beaks rise slightly above the hinge line. The periostracum (membrane on the surface of the shell) is yellowish tan to reddish-brown and may have concentric green rings. The beak cavity is shallow, and the shell interior is white to dull bluish white (Parmalee and Bogan 1998, Williams et al. 2008). Little is known about the habitat

requirements or life history of the Georgia pigtoe; however, it is most often found in shallow runs and riffles with strong to moderate current and coarse sand-gravel-cobble bottoms. The host fish for glochidia of the Georgia pigtoe is currently unknown. The Georgia pigtoe is currently known from a few isolated shoals in the Upper Conasauga River in Murray and Whitfield Counties, Georgia, and in Polk County, Tennessee (Johnson and Evans 2000, Evans 2001). All recent collection sites occur within a 43-km (27-mi) reach of the river.

6.3.1.21 Critical Habitat for Georgia Pigtoe (*Pleurobema hanleyianum*)
The physical or biological features of Georgia pigtoe Critical Habitat include:

(1) Geomorphically stable stream and river channels and banks (channels that maintain lateral dimensions, longitudinal profiles, and sinuosity patterns over time without an aggrading or degrading bed elevation);
(2) A hydrologic flow regime (the magnitude, frequency, duration, and seasonality of discharge over time) necessary to maintain benthic habitats where the species is found. Unless other information becomes available, existing conditions at locations where the species occurs will be considered as minimal flow requirements for survival;
(3) Water quality, including temperature, pH, hardness, turbidity, oxygen content, and chemical characteristics necessary for normal behavior, growth, and viability of all life stages.
(4) Sand, gravel, cobble, boulder, or bedrock substrates with low to moderate amounts of fine sediment and attached filamentous algae.
(5) The presence of fish host(s) for the Georgia pigtoe (currently unknown). Diverse assemblages of native chubs, minnows, stonerollers, and other stream-adapted fish species will serve as a potential indication of presence of host fish.

6.3.1.22 Gulf Moccasinshell (*Medionidus penicillatus*)
The gulf moccasinshell is a small freshwater mussel that can reach a length of 2.2 inches (5.5 centimeters). This species has an oval-shaped shell that is greenish brown with marks of green rays on the outer shell and green or dark purple on the inner shell. The valves are thin and contain two teeth in the left valve and one in the right (Natural Areas Inventory 2001). The gulf moccasinshell utilizes the brown darter (*Etheostoma edwini*) and blackbanded darter (*E. nigrofasciata*) as host fish for glochidia. Critical Habitat for the Gulf Moccasinshell (*Medionidus penicillatus*) is summarized in Critical Habitat for Four Northeast Gulf Drainages.

6.3.1.23 Ochlockonee Moccasinshell (*Medionidus simpsonianus*)
The Ochlockonee moccasinshell is a small freshwater mussel that is currently considered extirpated in Georgia but historically occurred in south Georgia. It has an oval shape with a light brown shell that features dark green rays. The inner shell is bluish-white. Its valves are thin, with two teeth in the left valve and one tooth in the right valve. The Ochlockonee moccasinshell inhabits large creeks and mid-sized rivers of moderate current that contain a sandy, gravel floor. Critical Habitat for the Ochlockonee Moccasinshell (*Medionidus simpsonianus*) is summarized in Critical Habitat for Four Northeast Gulf Drainages.

6.3.1.24 Oval Pigtoe (*Pleurobema pyriforme*)
The oval pigtoe is a small to medium-sized mussel that can grow to 2.4 inches. The shell is suboviform and compressed with a shiny smooth, yellow to dark brown, and rayless outer layer.

The oval pigtoe inhabits mid-sized rivers and small creeks with a slow to moderate current and a sandy silt to gravel floor. It is found in the Apalachicola-Chattahoochee-Flint, Ochlockonee, and Suwannee River and Econfina Creek basins. The species historical range included Alabama, Florida, Georgia. Critical Habitat for the Oval Pigtoe (*Pleurobema pyriforme*) is summarized in Critical Habitat for Four Northeast Gulf Drainages.

6.3.1.25 Purple Bankclimber (*Elliptoideus sloatianus*)

The purple bankclimber is a large freshwater mussel that can reach a length between 4-5.5 inches (10-14 centimeters). This species has a nearly rhomboidal (only opposite sides of shell are equal in size) shell, with a well-sculpted grey to black colored outer section and an inner shell that is white but transitions to purple towards the shell edge. The left valve contains two teeth, and the right valve contains one tooth (Florida Natural Areas Inventory 2001). The mosquito fish (*Gambusia holbrooki*) and the blackbanded darter (*Etheostoma edwini*) are thought to be the host fish for the purple bankclimber (O'Brien and Williams 2002). Critical Habitat for the Purple Bankclimber (*Elliptoideus sloatianus*) is summarized in Critical Habitat for Four Northeast Gulf Drainages.

6.3.1.26 Shinyrayed Pocketbook (*Hamiota subangulata*)

The shinyrayed pocketbook is a mid-sized freshwater mussel that can reach a length of 3.3 inches (8.5 centimeters). This species has a smooth, elliptical shaped shell that is yellowish-brown with green rays on the outer shell and a white inner shell. The left valve has two large teeth, and the right valve has one large, flattened tooth (Florida Natural Areas Inventory 2001). Glochidia are released from late May through mid-July when the water temperature ranges from 68°F-74.3°F (20-23.5°C). The largemouth bass (*Micropterus salmoides*) and spotted bass (*Micropterus punctulatus*) are the primary hosts for the shinyrayed pocketbook (O'Brien and Box 1999). Critical Habitat for the Shinyrayed Pocketbook (*Hamiota subangulata*) is summarized in Critical Habitat for Four Northeast Gulf Drainages.

6.3.1.27 Southern Clubshell (*Pleurobema decisum*)

The southern clubshell is a medium-sized mussel, with a roughly rectangular, yellow to yellowish brown shell. Glochidia hosts include minnow species (*Cyprinella venusta*, *C. callistia* or *C. trichroistia*). The southern clubshell lives burrowed in gravel and sand at the bottom of large creeks and rivers. It is found only in the Mobile River Basin of Alabama, Georgia, Mississippi and Tennessee. Critical Habitat for the Southern Clubshell (*Pleurobema decisum*) is summarized in Critical Habitat for Mobile River Basin Mussels.

6.3.1.28 Southern Pigtoe (*Pleurobema georgianum*)

The southern pigtoe is a small to medium-sized mussel measuring up to 65 mm in length. The shell is elliptical to oval in outline and somewhat compressed. The posterior slope is smoothly rounded. The pseudocardinal teeth (protrusions on the dorsal interior surface of the shell) are small but well-developed, and the nacre is white. The periostracum is yellow to yellow-brown. Growth lines are numerous and may be dark brown. Small specimens may have green spots at the growth lines along the posterior ridge and near the umbo. The southern pigtoe occurs in riffles, runs, and shoals of medium creeks to large rivers in sand and gravel substrates. The southern pigtoe is a short-term brooder, gravid during spring and early summer. The Alabama shiner, blacktail shiner, and tricolor shiner have been reported as hosts for this species (MRBMRC 2010). However, attempts in 2010 and 2015 to culture this species, found the blacktail shiner to be a poor host, producing only 49

juveniles from 31 infested blacktail shiners (Johnson 2018). Critical Habitat for the Southern Pigtoe (*Pleurobema georgianum*) is summarized in Critical Habitat for Mobile River Basin Mussels.

6.3.1.29 Suwannee Moccasinshell (*Medionidus walkeri*)

The Suwannee moccasinshell is a small mussel that rarely exceeds 50 millimeters (2.0 inches) in length. Its shell is oval with corrugations extending along the posterior ridge. The corrugations are sometimes faint. The exterior of the shell is greenish yellow to brown with green rays of varying width and intensity in young individuals and olive brown to brownish black with rays often obscured in mature individuals. The sexes can be distinguished, with females being smaller and longer than males. In laboratory trials, Suwannee moccasinshell glochidia transformed only on darters—primarily on the blackbanded darter (*Percina nigrofasciata*) and to a lesser extent on the brown darter (*Etheostoma edwini*)—indicating that the mussel is a host specialist and dependent on darters for reproduction (Johnson et al. in Press).

6.3.1.30 Critical Habitat for Suwannee Moccasinshell (*Medionidus walkeri*)

The physical or biological features of the Suwannee moccasinshell Critical Habitat include:

(1) Geomorphically stable stream channels (channels that maintain lateral dimensions, longitudinal profiles, and sinuosity patterns over time without an aggrading or degrading bed elevation).
(2) Stable substrates of muddy sand or mixtures of sand and gravel, and with little to no accumulation of unconsolidated sediments and low amounts of filamentous algae.
(3) A natural hydrologic flow regime (magnitude, frequency, duration, and seasonality of discharge over time) necessary to maintain benthic habitats where the species is found, and connectivity of stream channels with the floodplain, allowing the exchange of nutrients and sediment for habitat maintenance, food availability, and spawning habitat for native fishes.
(4) Water quality conditions needed to sustain healthy Suwannee moccasinshell populations, including low pollutant levels (not less than State criteria), a natural temperature regime, pH (between 6.0 to 8.5), adequate oxygen content (not less than State criteria), hardness, turbidity, and other chemical characteristics necessary for normal behavior, growth, and viability of all life stages.
(5) The presence of abundant fish hosts is necessary for recruitment of the Suwannee moccasinshell. The presence of blackbanded darters (*Percina nigrofasciata*) and brown darters (*Etheostoma edwini*) will serve as an indication of fish host presence.

6.3.1.31 Triangular Kidneyshell (*Ptychobranchus greenii*)

The triangular kidneyshell is oval to elliptical in outline and can reach 85 mm in length (Williams et al. 2008). The shell is moderately compressed and may be flattened ventral to the umbos. The posterior ridge is high, rounded and the posterior slope is moderately steep. The pseudocardinal teeth are heavy, and the laterals are heavy, straight to slightly curved and short. The periostracum is tawny to brown, usually without rays, but when present are thin, sparse, and usually confined to the posterior slope (Williams et al. 2008). The species historical range included Alabama, Georgia, Tennessee.

6.3.1.32 Critical Habitat for Mobile River Basin Mussels

Alabama moccasinshell, Coosa moccasinshell, fine-lined pocketbook, southern clubshell, southern pigtoe, and triangular kidneyshell share Critical Habitat in the Mobile River Basin with the following physical or biological features:

(1) Geomorphically stable stream and river channels and banks;
(2) A flow regime (i.e., the magnitude, frequency, duration, and seasonality of discharge over time) necessary for normal behavior, growth, and survival of all life stages of mussels and their fish hosts in the river environment;
(3) Water quality, including temperature, pH, hardness, turbidity, oxygen content, and other chemical characteristics necessary for normal behavior, growth, and viability of all life stages;
(4) Sand, gravel, and/or cobble substrates with low to moderate amounts of fine sediment, low amounts of attached filamentous algae, and other physical and chemical characteristics necessary for normal behavior, growth, and viability of all life stages;
(5) Fish hosts with adequate living, foraging, and spawning areas for them;
(6) Few or no competitive or predaceous nonnative species are present.

Currently, the greatest general threat to the survival and recovery of the Mobile River Basin mussel species is the small size, extent, and isolation of their remaining populations. These mussel species were once widespread in the Basin, found in a continuum of small streams to large rivers in 2 or more major drainages. 30 major dams were constructed in the Basin during the 20th century. These dams and their impounded waters present physical barriers to the natural dispersal of mussels (they prevent emigration (dispersal) of host fishes), and effectively isolate surviving mussel populations in limited portions of the Basin's major drainages. Small isolated aquatic populations are subject to natural random events (droughts, floods), and to changes in human activities and land use practices (urbanization, industrialization, mining, certain agricultural activities and practices, etc.), that may severely impact aquatic habitats (Neves et al. 1997). Without avenues of emigration to less affected watersheds, mussel populations gradually disappear where land use activities result in deterioration of aquatic habitats. Local random events, and changes in human activities within the Basin's unimpounded watersheds are believed to have caused or contributed to the disappearance of mollusks from significant portions of isolated stream habitats, resulting in the extinction of as many as 13 mussels, as well as several freshwater snail species (USFWS 2000).

6.3.1.33 Critical Habitat for Four Northeast Gulf Drainages

Fat threeridge, Gulf moccasinshell, Ochlockonee moccasinshell, oval pigtoe, purple bankclimber and shinyrayed pocketbook share Critical Habitat in the northeast gulf drainages with the following physical or biological features:

(1) A geomorphically stable stream channel (a channel that maintains its lateral dimensions, longitudinal profile, and spatial pattern over time without a consistent aggrading or degrading bed elevation);
(2) A predominantly sand, gravel, and/or cobble stream substrate with low to moderate amounts of silt and clay;
(3) Permanently flowing water;

(4) Water quality (including temperature, turbidity, dissolved oxygen, and chemical constituents) that meets or exceeds the current aquatic life criteria established under the Clean Water Act (CWA) (33 U.S.C. 1251– 1387);
(5) Fish hosts (such as largemouth bass, sailfin shiner, brown darter) that support mussel larval life stages.

Snails

6.3.1.34 Interrupted Rocksnail (*Leptoxis foremani*)
The interrupted rocksnail is a small to medium sized pleurocerid snail that historically occurred throughout the Coosa River drainage of Alabama and Georgia Individuals tend to move slowly, except in response to changes in water level. Pleurocerid snails are considered generalist scrapers and generally feed by ingesting periphyton, and biofilm detritus scraped off the substrate by the snail's radula. The interrupted rocksnail lives attached to bedrock, boulders, cobbles and gravel in riffles, shoals, or bedrock outcrops of medium to large rivers of eastern North America to the Rockies. Interrupted rocksnails lay their adhesive eggs within the same habitat they occupy, as documented by P.D. Johnson in 2004. This species is currently found in the Oostanaula River.

6.3.1.35 Critical Habitat for Interrupted Rocksnail (*Leptoxis foremani*)
The primary constituent elements of interrupted rocksnail Critical Habitat include:

(1) Geomorphically stable stream and river channels and banks (channels that maintain lateral dimensions, longitudinal profiles, and sinuosity patterns over time without an aggrading or degrading bed elevation).

(2) A hydrologic flow regime (the magnitude, frequency, duration, and seasonality of discharge over time) necessary to maintain benthic habitats where the species is found. Unless other information becomes available, existing conditions at locations where the species occurs will be considered as minimal flow requirements for survival.

(3) Water quality, including temperature, pH, hardness, turbidity, oxygen content, and chemical characteristics necessary for normal behavior, growth, and viability of all life stages.

(4) Sand, gravel, cobble, boulder, or bedrock substrates with low to moderate amounts of fine sediment and attached filamentous algae.

6.4 Plants

6.4.1.1 Alabama Leather Flower (*Clematis socialis*)
Populations of the Alabama leather flower have been found only in areas disturbed by human activity. Natural habitats are believed to be open grass-seed-rush prairie areas and adjoining hardwood swamp forests subject to more frequent fire disturbance (Govus 1999), natural prairie-like openings in the forest (Kral 1982) and/or in canopy gaps in mature forests from tree death, fire or grazing (Garrett 2005).

In Georgia, the Alabama leather flower occurs in calcareous flatwood communities growing on circum-neutral soils of the Tupelo series with likely Dowellton series inclusions (Moffett in litt. 2007).

The Alabama leather flower is clonal and is found occurring in tight patches or sparsely scattered (Goertzen and Boyd 2007). Though plants are found in sunny and shaded conditions, they are more vigorous in full or partial sunlight where plant competition is low (Emanuel 2000, 2002; Garrett 2004, 2005; Garrett and Schotz 2005; Sherbundy and Martin 2007). Plants are believed to primarily reproduce clonally (Kral 1982, Garrett 2004); however, the relative importance of clonal and sexual reproduction is unknown (Goertzen and Boyd 2007). Timmerman-Erskine and Boyd (1999) suggested that sexual reproduction in this species was limited by a combination of pollinator frequency, herbivory, low light levels, and post-maturation achene predation by mice.

6.4.1.2 American Chaffseed (*Schwalbea americana*)

American chaffseed is a perennial, hemiparasitic herb that requires a high fire-return interval, or fire surrogate to persist across the landscape. American chaffseed occurs in fire-maintained longleaf pine flatwoods and savannas. Often it is found in ecotonal areas between peaty wetlands and xeric sandy soils. Kral described American chaffseed habitat in 1983 as an open grass-sedge system in moist acidic sandy loams or sandy peat loams. Chaffseed is dependent on disturbance factors like fire, mowing, or fluctuating water tables to maintain the open to partly open conditions that it requires. In New Jersey, American chaffseed occurs in open areas that have been maintained by mowing within a pitch pine (*Pinus rigida*) community. In Massachusetts, one population of American chaffseed occurs in an open area managed by fall mowing (USFWS 2019a). Historically, the species probably existed on savannas and pinelands throughout the coastal plain and on sandstone knobs and plains inland where frequent, naturally occurring fires maintained these sub-climax communities. Under these conditions, herbaceous plants like American chaffseed were favored over trees and shrubs.

6.4.1.3 Canby's Dropwort (*Oxypolis canbyi*)

Canby’s dropwort is a perennial herb with fibrous roots ending in small tubers. In Georgia, it occurs in wetlands, such as cypress ponds and sloughs, Carolina bays, and wet savannas, with acidic, organic soils and fluctuating, though usually high, water levels, and with patchy or no canopy cover. It is strongly clonal and most populations are maintained by asexual reproduction, although it does display compound clusters of small white flowers from August through September (Murdock and Raynor 1990).

6.4.1.4 Cooley's Meadowrue (*Thalictrum cooleyi*)

Cooley's meadowrue is a rhizomatous, dioecious, perennial herb. It flowers in late June and early July. All of the known Cooley's meadowrue populations occur in the Coastal Plain Province. The species grows in circumneutral soils (pH near 7) in fire-dependent wet savannas, grass-sedge bogs, wet borders of intermittent drainages or swamp forests, and also roadsides and powerline rights-of-way through these habitats. It is found on fine sandy loam soils that are at least seasonally (winter) moist or saturated and are only slightly acidic (pH 5.8- 6.6).

6.4.1.5 Florida Torreya (*Torreya taxifolia*)

The Florida torreya is a dioecious coniferous tree found in the slope forest (FNAI 2010) that cover hammocks, steep, deeply shaded limestone slopes and wooded ravines along the east side of the Apalachicola River in Florida, and adjacent Lake Seminole in Georgia. Soils in these areas are within the orders Alfisols and Mollisols. Although scientists speculated that construction of Lake Seminole and logging contributed to the destruction of Florida torreya's habitat (e.g., alteration of water seepage patterns), the growth of *Torreya* plants was not suppressed during or immediately following the construction of the dam, and likely was not a major factor (Atchley 2004).

In general, the current populations, which are declining in numbers, are characterized by small individuals that are failing to achieve reproductive maturity. Trees appeared to be smaller at Florida sites compared to trees in Georgia's site, but currently it is unknown. Given the lack of seed production in the wild and potentially a decline due to a disease, all population viability models predict extinction (Schwartz et al. 2000b). Two factors have been speculated as potential threats: changes in soil chemistry associated with disruption of hydrology when upload topsoils were plowed in the 1950's, and perhaps fire suppression (Schwartz et al. 1995).

6.4.1.6 Fringed Campion (*Silene polypetala*)

Fringed campion is a patch-forming perennial herb. It reproduces sexually by seed after flowering mid-March-May. It also reproduces vegetatively by the growth of ground-hugging, horizontal stems rooting at nodes and tips of runners and forming mats. It occurs on steep slopes of deep ravines or north-facing hillsides, sometimes on nearly level ground in mature hardwood or hardwood-pine forests on river bluffs, small stream terraces, moist slopes, and well-shaded ridge crests.

6.4.1.7 Georgia Rockcress (*Arabis georgiana*)

Georgia rockcress often occurs along major river courses and grows in a variety of dry mesic to mesic soils, including shallow soil accumulations on rocky bluffs, ecotones of sloping rock outcrops, and sandy loam along eroding riverbanks. These habitat conditions result in micro-disturbances, such as sloughing soils with limited accumulation of leaf litter or canopy gap dynamics, possibly with wind-thrown trees, which provide small patches of exposed mineral soil in a patchy distribution. It is occasionally found within limestone or dolomitic glades. This species is adapted to high or moderately high light intensities, generally with a mature canopy providing partial shading.

This species occurs on soils that are circumneutral to slightly basic (pH between 6.5 and 7.5) in the Ridge and Valley, Piedmont, and Southeastern Plain ecoregions. Georgia rockcress occurs in locations between 24 – 98 meters (78 – 322 feet) in elevation (Schotz 2010) that are underlain or otherwise influenced by limestone or granite-gneiss. The soils at these locations are well drained, with low to moderate water retention capacity (Schotz 2010).

The life stages of a perennial plant such as Georgia rockcress consist of the dispersing and germinating seed, basal rosette, vegetative plant, and reproductive plant. Georgia rockcress possesses a thick rootstock that may live for many years (Schotz 2010) but is considered a short-lived perennial (Garcia 2012).

No studies of dispersal are known for Georgia rockcress. The degree to which Georgia rockcress reproduces from seed in the wild is not well-understood, however the species reproduces easily

when grown from seed in garden plots (Elmore 2010). It is likely that gravity is a primary dispersal agent for this species. Surface water runoff likely plays a secondary role in dispersal. Water action could move seeds a few meters (about 10 feet) down slope (Schotz 2010) with longer-distance dispersal via large waterways such as rivers is undocumented, but likely.

Given the propensity of Georgia rockcress to grow in steeply sloped locations with thin soil, seed bank development is not likely extensive. No studies of seed bank presence or longevity are known. Seeds do not seem to need a long period of after ripening before germination, requiring only the onset of cool temperatures in the fall and winter (Allison 1995), suggesting that germination is typically good (Schotz 2010).

6.4.1.8 Green Pitcher-plant (*Sarracenia oreophila*)

Green pitcher-plant is a carnivorous herb arising from moderately branched rhizomes. Pitcher leaves wither by late summer and are replaced by falcate phyllodia (flattened leaves), which persist until the next season. Pitcher leaves wither by late summer and are replaced by falcate phyllodia (flattened leaves), which persist until the next season. Flowers are borne singly on scapes 45-70 cm (18-28 in.) long. The plants grow in acidic soils in moist upland areas, rich woodlands, wet thickets, and along boggy sandy streams. For the seeds of this species to germinate and become established, they must fall on bare moist mineral soil. Though this condition is not rare in undisturbed bogs, fire suppression and habitat degradation have made such sites rare. For this reason, there is little seedling recruitment and most reproduction is asexual.

6.4.1.9 Hairy Rattleweed (*Baptisia arachnifera*)

Hairy rattleweed is an herbaceous perennial. Hairy rattleweed flowers from June through August. The flowers mature into fruit from August through September, and seed dispersal occurs from October through March. Hairy rattleweed is primarily beepollinated like other plants in the pea family. Hairy rattleweed reproduces sexually and asexually. The other common name for this species, tumbleweed, speak to hairy rattleweed's seed dispersal technique where mature fruiting stems break off and get blown and distributed by the wind. Hairy rattleweed reproduces asexually by long rhizomatous roots. It can be propagated from root cuttings like other rhizomatous pants.

Hairy rattleweed occurs in fire-maintained longleaf pine-saw palmetto flatwoods on level, to gentle sloping, land with a sparse canopy and shrub layer, as well as herbaceous cover that consists mostly of wiregrass (Aristida stricta). Sometimes it occurs in open pine-wire grass communities that have occasional oak species, including turkey oak (*Quercus laevis*), live oak (*Q. virginiana*) and water oak (*Q. nigra*). Soils are sandy groundwater spodosols and are underlain by an organic hardpan. They are poorly drained with moisture levels ranging from near saturation in early spring to dry in late summer or fall. This type of habitat often occurs adjacent to, and grades into, pocosin or bay swamp habitats scrub-shrub wetlands toward the wetter end of the spectrum, and habitats typical of longleaf pine-turkey oak communities toward the drier end of the spectrum. The longleaf-slash pine flatwood communities where hairy rattleweed occurs are fire-adapted communities that need to be burned on a 2-to-3-year fire return interval. Most of hairy rattleweed's habitat is no longer managed with fire. As most suitable hairy rattleweed habitat has been converted to densely crowed pine plantations, hairy rattleweed is restricted to the open conditions along roadsides and utility rights-of-way.

6.4.1.10 Harperella (*Ptilimnium nodosum*)

In Georgia, Harperella occurs in a cypress pond in the Coastal Plain, and in seeps on the edges of granite outcrops in the Piedmont. In other states, it grows in the flooded margins of rocky streams. Harperella is an annual that utilizes two complementary reproductive strategies. Wells (2012) found that harperella can utilize both asexual and sexual reproduction as the water level fluctuates within the growing season, an adaptive strategy by species to variable and flood-prone cobble bar habitat, where conditions fluctuate based on precipitation. Asexual reproduction is favored by high water and flooding during flowering, seed set, and germination in late summer and fall. During wet years, this method may be the only successful means of reproduction – critical for an annual plant. However, sexual reproduction has a far greater potential for producing offspring and is favored when low water persists during flowering, seed set, and germination – provided the cobble bar remains damp throughout (Wells 2012; Frye and Tessel 2012). It appears that both forms of reproduction contribute to overall population size each year but that the contribution of each may be regulated by streamflow patterns, as the presence of harperella is positively correlated with fine sediment deposits that are more mobile during flood events (Frye and Tessel 2012). Hydrologic changes such as increased flooding, water discharges, or surface run off in the watersheds could reduce opportunities for sexual reproduction and restrict gene flow among sites. Long periods of high water or increased erosion/siltation of habitat could also impair the ability of new seedlings to become established and limit colonization of new sites.

6.4.1.11 Kral's Water-plantain (*Sagittaria secundifolia*)

Kral's water-plantain is clonal, and reproduction is primarily asexual, which suggests there may be low genetic variability within the isolated populations. Although capable of sexual reproduction, Kral's water-plantain spreads primarily by growth of its underwater rhizomes. Female and male flowers occur separately on the same plant. Approximately 1 percent of this Sagittaria sets flowers. This small percentage of plants occur in habitats characterized by full sun and where low water levels permit above water leaf growth (Whetstone 1988). Bees are likely pollinators, but little is known about Kral's water-plantain reproduction. Many of the population sites are characterized by conditions other than those associated with flowering and sexual reproduction.

Kral's water-plantain typically occurs on frequently exposed shoals or rooted among loose boulders in quiet pools up to 3.2 feet (1 meter) in depth. In Georgia, the plant occurs in narrow, unpolluted streams over sandstone, cracks in sandstone riverbeds, exposed rocky shoals, and among boulders in quiet stream pools. The plant does not occur in areas with deep pools, large boulders or highly turbulent water. Anecdotal observations by researchers and National Park Service biologists suggest flowering is triggered by low-flow periods in Little River Canyon that allow the inflorescence to remain above water and allow submerged leaves access to sunlight (McCartney 1999). Periods of high flow also may be necessary to reduce competition from algal mats and other plants. This suggests that maintaining natural hydrological cycles will help retain the viability of the species.

Plants grow in pure stands or in association with various submergent and emergent plants. The immediate banks are often dominated by thickets of shrubs and adjacent sphagnous seeps which are commonly contain sedges. Streams with Kral's water-plantain occurrences are typically narrow and bounded by steep slopes.

Sexual reproduction increases genetic variability, which enables species to adapt to changing conditions. Therefore, it is important to maintain and restore suitable flowering habitat to encourage reproduction by sexual means.

6.4.1.12 Large-flowered Skullcap (*Scutellaria montana*)

Large-flowered skullcap is an herbaceous plant found in moist hardwood and hardwood-pine forests with open understory. It occurs in slope, ravine, and stream-bottom forests in northwestern Georgia and adjacent southeastern Tennessee. It is found in rocky, submesic to xeric, well-drained, and slightly acidic soils.

Nutlets are released from mid-June to mid-July, overwinter, and apparently germinate in late March. Mature individuals that have perennated as root stocks begin shoot growth in late March. By early April, plants are 5-10 cm tall and are pushing through the leaf litter. Anthesis typically begins during mid-May and continues through early June. Pollination is principally exclusively by Hymenoptera of the superfamily Apoideae (bees). Nutlets mature over the next two to four weeks post-pollination.

6.4.1.13 Michaux's Sumac (*Rhus michauxii*)

Michaux's sumac is a shrub that grows in sandy or rocky open woods on sandy or sandy loam soils with low cation exchange capacities and appears to depend on some form of disturbance to maintain the open quality of its habitat. This disturbance may be in the form of fire, wind throws, or openings created by roads, railroads and utility rights of way. It has been considered dioecious, however recent observations suggest some plants may be monoecious and others may change sex from year to year. It also reproduces asexually via rhizomes. Michaux’s sumac produces fruit, often with sterile seeds. The pollinators and seed dispersers are not known for Michaux’s sumac, however other sumac species are pollinated by bees and birds disperse the seeds.

6.4.1.14 Mohr's Barbara's Buttons (*Marshallia mohrii*)

Mohr's Barbara's buttons is a perennial herb. Plants flower between May and the end of June, setting fruit in July and August. It is protandrous (anthers release pollen before pistil of that flower is receptive) and appears to be an obligate out-crosser (Watson and Estes 1990). Mohr’s Barbara’s Buttons appears to be adapted to disturbance and is often found growing in open to semi-shaded graminoid-dominated habitats. Habitats include moist areas in open woodlands, calcareous prairies and barrens, and along shale-bedded streams, as well as roadsides and utility right-of-way corridors. The soils are sandy clays, which are alkaline, high in organic matter, and seasonally wet.

6.4.1.15 Morefield's Leather Flower (*Clematis morefieldii*)

Morefield’s leather-flower is a perennial vine. Morefield’s leather-flower blooms from May to July. Pollinated flowers can produce abundant (15 or more per flower) achenes (Crabtree 2014). Little information on effective pollinators is available, but Crabtree (2011) observed bumblebees (Bombus spp.) visiting flowers of Morefield’s leather-flower. Various studies and observations indicate that flower and fruit production are positively correlated with precipitation (Emanuel 2000; Boyd and Paris 2013; Crabtree 2014; Paris et al. 2015, 2016). Herbivory by vertebrates and insects is apparently common for Morefield’s leather-flower (Boyd and Paris 2013; Paris et al. 2015, 2016) and can reduce a plants’ flower and fruit production (Paris et al. 2015). Small flower buds are particularly vulnerable to herbivory by Lepidopteran larvae (Paris et al. 2016). A study by Paris et al. (2015) indicated that insecticide use could be an effective management tool to increase sexual

reproduction of Morefield's leather-flower. Seeds may remain dormant during their first year after dispersal, with many seeds germinating in the second-year post-dispersal (Paris et al. 2016). Paris et al. (2016) noted that post-dispersal predation of achenes was generally low during a multi-year study. Crabtree (2011) repeatedly observed Morefield's leather-flower seedlings along deer trails, suggesting that white-tailed deer (*Odocoileus virginianus*) may be potential dispersal agents of the species' seeds, but additional research is needed to elucidate this putative relationship.

Plants occur in open woodlands over limestone bedrock typically on south- or southwest-facing mountain slopes within the Ridge & Valley ecoregion and are often found near seeps and springs in red cedar-hardwood forests, particularly within transitional zones between dry calcareous forests and mesic forests (Kral 1987; Weber 1991; Cook 2018; USFWS 1994, 2018).

6.4.1.16 Ocmulgee Skullcap (*Scutellaria ocmulgee*)

Ocmulgee skullcap is a perennial herb. Ocmulgee skullcap is restricted to the moist, calcareous (calcium rich) north-facing slopes along the Ocmulgee and Savannah River watersheds in Georgia and South Carolina. In these isolated bluff and slope areas, the forest structure is composed of a mixed-hardwood species of trees with a partially open canopy to allow the plants to reach maturity and produce viable seed. The mature, mixed-level canopy provides the mottled shade required by Ocmulgee skullcap. The river bluffs and steep slopes experience localized disturbances including water runoff that limit the accumulation of leaf litter and limit competition from other plants in the shaded, steep forest environment.

The lifespan of Ocmulgee skullcap is estimated to be 5 to 8 years, with 3 to 6 years of potential viable seed production. The species matures to produce seed in either the first or second year following spring germination. Ocmulgee skullcap reproduces sexually and is pollinated by over 35 different pollinator species, including bees, moths, butterflies, and sometimes flies and wasps (Cruzan 2001, pp. 1577–1578; Adams et al. 2010, p. 53,).

Ocmulgee skullcap seeds are released from the plant in response to disturbance of the stem by wind, rain, animal activity, or other means. The seeds require this dislodging and bare soil that is rich in calcium, and under partial shade, to germinate. Juvenile Ocmulgee skullcap individuals require enough sunlight, moisture, and calcium, as well as the presence of pollinators and stable soil conditions, to reach maturity and produce seed. In addition, juvenile plants are sensitive to competition for needed resources. Mature Ocmulgee skullcap plants require the same resources as juvenile plants, including sufficient time without herbivory or other removal of the seed calyx in order disperse seed.

6.4.1.17 Critical Habitat for Ocmulgee Skullcap (*Scutellaria ocmulgee*)

The physical or biological features of the Ocmulgee skullcap Critical Habitat include:

(1) River bluffs with steep and/or shallow soils that are subject to localized disturbances that limit the accumulation of leaf litter and competition within the Upper Gulf Coastal Plain and Piedmont of Georgia.
(2) (2) Well-drained soils that are buffered or circumneutral (pH between 6.5 and 7.5) generally within regions underlain or otherwise influenced by limestone or marl (mixed carbonate-clay rock).

(3) A mature, mixed-level canopy with spatial heterogeneity, providing mottled shade and often including a rich diversity of grasses and forbs characterizing the herbaceous layer.
(4) Intact forested habitat that is ecologically functional (i.e., with mature canopy and discrete disturbances) and buffered by surrounding habitat to impede the invasion of competitors.

6.4.1.18 Persistent Trillium (*Trillium persistens*)

Persistent trillium is a spring ephemeral and perennial herb typically found in mixed Pine-Hemlock-hardwood forests in ravines or along streams. Seeds shed in the summer germinate the following spring and, within a year or two, send up a single, spatula-shaped seed leaf (cotyledon) for one year's growing season. The next year, a true leaf is produced, and, in subsequent years, three-leaved plants appear. After 5 - 7 years (possibly fewer on the Coastal Plain), the plant produces a flowering stalk. Trillium seeds have small, fat-rich appendages called elaiosomes that are appealing to ants, yellow jackets, and other wasps, which carry the seed back to their nests, inadvertently dispersing the trillium seeds. Seeds are dispersed longer distances when the fruits are eaten by other animals such as deer and woodchucks. Some seeds are left where they fall if the elaiosomes are eaten off by beetles, resulting in clusters of seedlings near the parent plant. Some trilliums produce clonal rhizome offshoots that develop into immature plants that are eventually separated from the parent plant as the rhizomes decay. Mature trillium plants are very long-lived, perhaps living more than 100 years, but since the rhizome continues to lengthen and produce shoots on one end, while the other end decays, it is impossible to determine age from rhizome growth scars.

Although little is known about microhabitat requirements of persistent trillium, it appears the species can tolerate harsh conditions (e.g., drought, temperature extremes) without marked reduction in mortality or seed set (Gaddy 1985, Slay 1989). However, drier areas, like the upper slopes of Tallulah Gorge, tend to have aggregations of plants skewed toward older individuals, either sterile or flowering individuals, with fewer juveniles (J. Candler, pers. comm., 2006; T. Patrick, pers. comm., 2006; Slay 1989; USFWS 1984), suggesting lower levels of recruitment under harsh conditions. Persistent trillium is one of the few Southeastern U.S. members of the genus that prefers highly acidic soils and may require lowering of soil pH below 5.2 (S. Yates, pers. comm., 2006).

6.4.1.19 Pondberry (*Lindera melissifolia*)

Pondberry is a deciduous shrub that is typically found in pond margins and wet savannas. Plants are rhizomatous, frequently propagating by vegetative sprouts and forming clonal colonies. Plants are dioecious (each plant is either a male or a female) and produce clusters of small, yellow flowers in early spring prior to leaf development from buds on branches produced from the growth during the preceding year. Fruits are green-colored drupes when immature that ripen to red by fall.

6.4.1.20 Relict Trillium (*Trillium reliquum*)

Relict trillium is a rhizotomous perennial forb. It is found in mature hardwood forests in rich ravines and on stream terraces; over calcium-rich bedrock such as amphibolite or limestone. Trilliums are perennial herbs that send up stems, leaves, and flowers in early spring, after temperatures have risen but before the forest canopy has leafed out. After flowering and fruiting, the aboveground plant disappears, persisting through the late summer, fall, and winter as an underground rhizome. Seeds shed in the summer germinate the following spring and, within a year or two, send up a

single, spatula-shaped seed leaf (cotyledon) for one year's growing season. The next year, a true leaf is produced, and, in subsequent years, three-leaved plants appear. After 5 - 7 years (possibly fewer on the Coastal Plain), the plant produces a flowering stalk. Carrion insects, including fly and beetle families, attracted to the fetid smell of the green to maroon sepals are believed to be the dominant pollinators, while ants are noted as important dispersal mechanisms for seeds (Folkerts et al. 1987; Waddell 2006). Deer and woodchucks disperse seeds over longer distances. Mature trillium plants are very long-lived, perhaps living hundreds of years, since the rhizome continues to lengthen and produce shoots on one end, while the other end decays.

6.4.1.21 Rock Gnome Lichen (*Gymnoderma lineare*)

Rock gnome lichen is found in the Southern Appalachian Mountains on vertical rock faces either at foggy high elevation areas or in deep gorges in lower elevations, both areas of high humidity. It appears the species needs a moderate amount of light but cannot tolerate too much sun intensity. It does well on generally open sites with northern exposure that are moist and where the seepage water from the forest soils above only flows during very wet times. The rocks on which this lichen grows are of several types, including igneous, metamorphic, and metasedimentary rocks such as quartz diorite, garnet-rich biotite, muscovite and quartz schist, quartz phyllite, metagraywacke, metaconglomerate, and metakoses containing feldspar and chlorite, amphibole, hornblende, and feldspar gneiss.

It is threatened by collection, logging, and habitat disturbance due to heavy use by hikers and climbers. It is also indirectly threatened by exotic insect pests and possibly air pollution, which are contributing to the demise of the Fraser fir forests at higher elevations in the Southern Appalachians.

6.4.1.22 Small Whorled Pogonia (*Isotria medeoloides*)

Small whorled pogonia occurs within canopy gaps or openings in hardwood or mixed hardwood-pine forests on lower slopes and stream terraces with acidic soils. It flowers from mid-May to mid-June, with the flowers lasting only a few days to a week. It may not flower every year, but when it does flower, one or two flowers are produced per plant. If pollinated, a capsule forms containing several thousand minute seeds. The pogonia appears to self-pollinate by mechanical processes. The flower lacks both nectar guides and fragrance and insect pollination has not been observed. This orchid grows in older hardwood stands of beech, birch, maple, oak, and hickory that have an open understory. Sometimes it grows in stands of softwoods such as hemlock. It prefers acidic soils with a thick layer of dead leaves, often on slopes near small streams.

6.4.1.23 Smooth Coneflower (*Echinacea laevigata*)

Smooth coneflower is a perennial herb. It reproduces both sexually by seed and asexually by rhizomatous growth. One rhizome can produce multiple rosettes, which can divide and become viable plants. With sexual reproduction, flowering occurs from late May through mid-July, and fruits develop from late June to September. The disk is a cluster of flowers that are pollinated by bees and butterflies. Each flower develops into dry one-seeded fruits which are dispersed by seed-eating birds and mammals. The fruiting structures often persist through the fall.

Smooth coneflower is currently known from open woods, cedar barrens, roadsides, dry limestone bluffs, utility line rights-of-way, and other sunny to partly sunny situations, usually on magnesium-

and calcium-rich soils associated with underlying mafic rock. Although some of the glades supporting E. laevigata are naturally self-sustaining (especially in Virginia), historically, much of the species' habitat probably was prairie-like habitat or post oak-blackjack oak savannas that were maintained by fires caused by lightning or set by native Americans. Loss of this open habitat to fire suppression and urbanization has resulted in the decline of the species and its reduction, in many cases, to marginal and highly vulnerable sites.

6.4.1.24 Swamp Pink (*Helonias bullata*)

Swamp pink is a perennial rhizomatous herb. The evergreen leaves of swamp pink can be seen year-round, and flowering occurs between March and May. It reproduces primarily through clonal rhizomatous growth, with a limited degree of sexual reproduction. Swamp pink is highly self-compatible (Sutter 1982, 1984). Seeds have elaiosomes and are likely dispersed by ants, with minimal additional dispersal by wind and occasionally water. Pollination does not represent a limiting factor in the species' existence. Orcutt (2019) conducted a 2-year study of swamp pink pollinators in Virginia and documented 41 unique insect taxa visiting swamp pink flowers. Insects of the order Hymenoptera made up 91 percent of the total insect visitors. Within Hymenoptera, taxa in the family Halictidae (sweat bees) accounted for 50 percent of all visitors and likely have the highest pollination value for swamp pink due to their intentional pollen-collecting habits (Orcutt 2019). Swamp pink flowers are self-compatible and not reliant solely on pollinators for reproduction; however, it is likely that these insect visitors facilitate cross-pollination and assist with the transfer of genes between swamp pink plants and populations.

Swamp pink is an obligate wetland species occurring along streams and seepage areas in freshwater swamps and other wetland habitats. The most evident factor determining the suitability of habitat for swamp pink is a constant water supply. The groundwater-influenced wetlands supporting the species are perennially saturated and rarely, if ever, inundated by floodwaters (Rawinski and Cassin 1986). The water table is at or very near the surface and fluctuates only slightly during spring and summer months (Sutter 1982).

6.4.1.25 Tennessee Yellow-eyed Grass (*Xyris tennesseensis*)

Tennessee yellow-eyed grass is a perennial herb found in sunny, wet habitats over calcareous bedrock such as spring runs, edges of shallow streams and ponds, seeps, and wet meadows in northwest Georgia. Research indicates that flower production and (perhaps) seedling recruitment is most extensive in locations that are relatively sunny and lack an overstory of shrub or tree canopies. The species does best in relatively open moist sites (Baskin and Baskin 2003). According to Moffett (2008), woody and herbaceous vegetation that shades and competes with the species can suppress Tennessee yellow-eyed grass growth and reproduction. The tiny seedlings appear to need relatively well-lit moist soil to become established and grow to maturity. Thus, the species is likely disturbance dependent and needs active management to main sites in suitable conditions for long-term viability (Boyd and Moffett 2010). This management strategy reveals that conservation of the species requires a more hands-on management approach than some endangered plant species (Moffett 2008). In the 2011, Boyd et al. reported that halictid bees and varying species of pollen consuming syrphid flies frequented the flowering Tennessee yellow-eyed grass plants most often. In 2000, Boyd et al. (2000) determined solitary bees to be the most important pollinators of

Tennessee yellow-eyed grass. However, the pollen supplementation study showed that flowers produce seeds without visitation by insects, likely by self-pollination (Boyd et al. 2011).

Populations are in spring meadows or along small streams. All sites feature nearly permanent moisture regimes, open, sunny conditions, and calcareous bedrock (shale, limestone, dolomite) or thin calcareous soils.

6.4.1.26 Virginia Spiraea (*Spiraea virginiana*)

Virginia spiraea is a perennial shrub that has a modular growth form with many branches. The species is clonal, with a root system and vegetative characteristics that allow it to thrive under appropriate disturbance regimes. Mature plants grow 3 to 10 feet tall. The species blooms from late May to late July, but flower production is sparse and does not begin until after the first year of establishment. Virginia spiraea has a clonal root system that can fragment and produce more plants. This form of vegetative reproduction is more common than flower pollination and seed dispersal in this species.

Virginia spiraea occurs along the banks of high gradient sections of second and third order streams, or on meander scrolls and point bars, natural levees, and other braided features of lower reaches (often near the stream mouth; USFWS 1992b). The species relies on periodic disturbances, such as high velocity scouring floods, which eliminate competition from trees and other woody vegetation. However, if the frequency and intensity of these floods are too great, the plant may become dislodged and wash downstream into less suitable habitat. There is a single exception to this species' preferred riverine habitat, which is a West Virginia population (Raleigh County) that occurs in a wet meadow near disturbance (USFWS 1992b).

The plant is threatened by small population size, a paucity of sexual reproduction and dispersal, and manipulation of riverine habitat.

6.4.1.27 White Fringeless Orchid (*Platanthera integrilabia*)

White fringeless orchid habitat is described as partially shaded sites with sandy and acidic soils in wet areas like seeps, seepage slopes, bogs, or swamps, occurring in both forested areas as well as restored grassland or woodland habitats and managed utility line corridors. The species is associated with a wide range of light availability, indicating that individuals can acclimate to, or populations have adapted to, locally prevalent environmental conditions. Available data indicate that the species requires the presence of a single fungal species, *Epulorhiza inquilina*, to form mycorrhiza in root cells, providing a source of carbon for seed germination and growth of seedlings and mature plants. White fringeless orchids also appear dependent on a limited number of diurnal Lepidoptera (butterflies and moths) species for pollination but could be adapted for pollination by nocturnal hawkmoths.

The remaining populations of white fringeless orchid are in many cases small, isolated, and have limited potential for recolonization should they be extirpated. The greatest threats to this species are loss or degradation of habitat, which are exacerbated by dynamics of small populations. The main causes of habitat degradation or loss include human development and silvicultural practices, which can result in conversion of habitat into non-native forest types or other land uses, altered hydrology, soil disturbance, and increased abundance of competing plants, both native and

introduced. Additional threats include loss of individual plants from unauthorized collecting, herbivory, or pathogens (81 FR 62826).

6.4.1.28 Whorled Sunflower (*Helianthus verticillatus*)

Whorled sunflower is a self-incompatible, clonal perennial and flowers from August into October (Matthews et al. 2002, Ellis and McCauley 2009). Self-incompatibility is a common strategy of flowering plants to promote outcrossing and prevent inbreeding (Silva and Goring 2001). Whorled sunflower propagates clonally via rhizomes (horizontal underground stems that produce roots and shoots) as well as by sexual reproduction (i.e., flowering and seed production); thus, many stems that appear to be individual plants are genetically identical to their neighbors, resulting in a clumped distribution (Ellis et al. 2006, Mandel 2010). Clumped distribution coupled with the species' self-incompatibility and short flight distances of potential pollinators (e.g., two-spotted long-horned bees (*Mellisodes bimaculatus*) and honeybees [*Apis mellifera*] have been observed visiting flowers of the species) increase the likelihood of geitonogamous self-pollination (transfer of pollen between flowers of this same genetic individual) that will result in unsuccessful pollination (Ellis 2008, Mandel 2010). Whorled sunflower likely requires pollinating invertebrates for successful reproduction; although, studies to determine effective pollinators of this species have not been conducted. The species is readily cultivated and seed germination is generally high in the laboratory. Upon transplanting, this species has been shown to reproduce rapidly from rhizomes, creating dense colonies of stems that can reach over 4 meters (13 feet) in height (Matthews et al. 2002). However, Ellis and McCauley (2009) reported lower germination rates in seeds produced from crosses between plants from a population in Madison County, Tennessee, compared to plants from a larger Alabama population. Lower rates of seed viability were also observed in second generation crosses of the Tennessee versus Alabama plants. These results suggest a possible influence of population size on individual fitness in whorled sunflower populations.

6.4.1.29 Critical Habitat for Whorled Sunflower (*Helianthus verticillatus*)

The physical or biological features of the whorled sunflower Critical Habitat include:

(1) Silt loam, silty clay loam, or fine sandy loam soils on landforms including broad uplands, depressions, stream terraces, and floodplains within the headwaters of the Coosa River in Alabama and Georgia and the East Fork Forked Deer and Tuscumbia rivers in Tennessee.
(2) Sites in which forest canopy is absent, or where woody vegetation is present at sufficiently low densities to provide full or partial sunlight to whorled sunflower plants for most of the day, and which support vegetation characteristic of moist prairie communities. Invasive, nonnative plants must be absent or present in sufficiently low numbers not to inhibit growth or reproduction of whorled sunflower.
(3) Occupied sites in which enough compatible mates are present for outcrossing and production of viable achenes to occur.

The features essential to the conservation of whorled sunflower may require special management considerations or protection to reduce the following threats: (1) Soil disturbance due to silvicultural site preparation, timber harvest, or cultivation of row crops; (2) indiscriminate herbicide use or mowing; (3) conversion of remnant prairie habitat to agricultural or industrial forestry uses; and (4) excessive shading or competition from native woody species or invasive, nonnative plants. Management activities that could ameliorate these threats include, but are not limited to: (1)

Avoiding areas located in close proximity to whorled sunflower sites when planning for establishing new sites for agriculture or pulpwood and timber production; (2) ensuring that herbicide use or mowing does not occur in whorled sunflower sites during the species' growing season; (3) locating suitable habitat, determining presence or absence of whorled sunflower, and protecting or restoring as many sites or complexes of sites as possible; (4) managing, including prescribed burning, mowing, and bushhogging, to reduce canopy cover, minimize competition from native and invasive, nonnative plants, and maintain characteristic moist prairie vegetation; (5) reaching out to all landowners, including private, State, and Federal landowners, to raise awareness of the plant and its habitat; and (6) providing technical or financial assistance to landowners to help in the design and implementation of management actions that protect the plant and its habitat.

Granite Outcrop Species

6.4.1.30 Black Spored Quillwort (*Isoetes melanospora*)
Black spored quillwort is a perennial herb that occurs in small depressions, or pools, formed in granite outcrops, which hold water for sufficient periods to support growth and reproduction (USFWS 2008). Black-spored quillwort was historically known from 13 populations and can now be found at 10 or 11 granite outcrops in Georgia.

6.4.1.31 Little Amphianthus (*Amphianthus pusillus*)
Little amphianthus is an aquatic, annual herb. It is found in full sun on shallow, vernal pools on granitic outcrops, with thin, gravelly soils and winter–spring inundation. Seeds germinate following the heavy rains of late fall or early winter, then young plants grow slowly during the winter. Flower buds begin to form by early February. By late February, flowering of both floating and submerged flowers is well underway, peaking in mid-March. As the pools begin to dry in April, the usually closed submerged flowers are exposed and begin to open. Larger plants will have between 10 and 15 flowers and fruits and seeds may form sexually or asexually. The fruits shed their seeds as the vernal pools dry, and the plants wither and disappear by late May and June.

Of the non-extirpated populations, three occur in Alabama, 51 occur in Georgia, and three occur in South Carolina. Of the known populations, 24 are listed in poor condition because of either low pool redundancy (the population consists of less than three pools) and/or populations occur at outcrops where there still is active quarrying. Nine new populations have been discovered in Georgia since the last 5-year review (USFWS 2008), but five of those populations are already classified as poor condition. Nine of the past extant populations have declined in status and three have been classified as extirpated since the last 5-year review (USFWS 2008). Seed bank sources may provide some adaptive capabilities of little amphianthus to respond to poor reproductive years, but as the number of plants decline in individual pools the seed bank also declines making population recovery more unlikely (Boyd and Bartig 1992).

6.4.1.32 Mat-forming Quillwort (*Isoetes tegetiformans*)
Mat-forming quillwort is a perennial herb that occurs in small depressions, or pools, formed in granite outcrops, which hold water for sufficient periods to support growth and reproduction (USFWS 2008). Mat-forming quillwort historically occurred at 10 granite outcrops across Georgia. There are currently 12 extant populations, including two of unknown condition, three introduced populations, one created population and six populations in various extant conditions.

6.5 Mammals

6.5.1.1 Gray Bat (*Myotis grisescens*)

Gray bats occupy caves or cave-like structures year-round. While gray bats prefer caves, summer colonies have been documented using dams, mines, quarries, concrete box culverts and the undersides of bridges. Gray bats use caves year-round for roosting and hibernating. Seasonal occupancy of caves differs between summer roost and winter hibernacula, and gray bats show strong site fidelity to caves (Arroyo-Cabrales and Timm 2008). Gray bats are known to migrate up to 326 miles between winter and summer caves. They use warmer (57 to 77 °F) caves for summer roost, and they are usually located in proximity (within 0.6 mile) to a body of water. Female bats that are raising young in maternity colonies require these elevated temperatures. The morphology of some caves may be more conducive to heat retention, such as, domed cave ceilings that retain more heat. While gray bats are predominantly found roosting in caves, maternity colonies have been documented using bridges (Keely and Tuttle 1999). Hibernation occurs in deep vertical caves in the winter. The temperature, humidity, and structure of a cave must be appropriate to host a gray bat colony. They hibernate in areas of their winter caves with temperatures that range from 43 to 52 °F. Gray bats require consistently cold temperatures to maintain hibernation and conserve energy in the winter months. Adult bats mate upon arrival at the wintering caves in September or early October. The female bats begin hibernation immediately following mating. The males and juveniles remain active but will enter hibernation by early November. The adult females will emerge from hibernation in late March or early April. At that time, the females who have mated will begin their pregnancy, while dispersing to maternity caves. Male and juvenile gray bats emerge shortly after the females and disperse to bachelor caves (Tuttle 1976). Given that approximately 98% of gray bats roost in as few as 15 major hibernacula, natural calamities at any one of the hibernacula could result in the loss of a significant amount of roosting habitat or bats.

Gray bats emerge from summer roosts early in the evening and forage along rivers, streams, ponds, lakes, and reservoirs adjacent to forested areas. They are dependent on major areas of water (Tuttle 1976). The species has been documented traveling from a few miles to twenty or more miles between their day roosts and nightly foraging areas (Lacki et al. 2007). Gray bats will fly in slightly open foraging sites from their roost site to commute to reach streams and rivers. Females and volant pups will travel longer distances to forage than lactating females who may stay within a few miles of the maternity roost (Lacki et al. 2007). The distance that a juvenile must travel each night from the maternity roost to quality foraging areas also becomes a significant factor in survival rates of young bats (Tuttle 1976). During long foraging trips from the main roost, gray bats often choose to roost for the night, multiple nights, or for only a few hours in an alternate roost such as bridges, culverts, or tunnels. Gray bats typically change their diets throughout the season consuming the insects most readily available at the time. They will feed on aquatic insects associated with water or wetland vegetation such as flies, beetles, caddisflies, stoneflies, and mayflies in late spring and into the summer. Later in the summer as the maternity roost disperses, they include other insects from the orders of moths, bees, wasps, ants, and leafhoppers in their diet (Lacki et al. 2007). Although mass mortality has not been documented for this species, white nose syndrome continues to threaten the gray bat.

For guidance on conducting bat surveys in Georgia, please visit the Georgia Department of Natural Resources Wildlife Resources Division Georgia Bat Survey Guidance, the Bats in Bridges Form, and Roost Monitoring Form webpages.

6.5.1.2 West Indian Manatee (*Trichechus manatus*)

The West Indian manatee is a large marine mammal. Manatees typically surface every three to five minutes to breathe but can hold their breath as long as 20 minutes. It lives in freshwater, brackish and marine habitats. Submerged, emergent, and floating vegetation are their preferred food. During the winter, cold temperatures keep the population concentrated in peninsular Florida and many manatees rely on the warm water from natural springs and power plant outfalls. During the summer they expand their range and on rare occasions are seen as far north as Rhode Island on the Atlantic coast and as far west as Texas on the Gulf coast.

The most significant problem presently faced by manatees in Florida is death or injury from boat strikes. The long-term availability of warm-water refuges for manatees is uncertain if minimum flows and levels are not established for the natural springs on which many manatees depend, and as deregulation of the power industry in Florida occurs. Their survival will depend on maintaining the integrity of ecosystems and habitat sufficient to support a viable manatee population. Today, the range-wide population estimate for the West Indian manatee is at least 13,000 manatees. When aerial surveys began in 1991, the minimum population estimate in Florida was 1,267 manatees. Today and with the use of more robust survey methodology, at least 8,350 are estimated to inhabit Florida, representing a significant increase over the past 33 years.

6.6 Species NOT Covered by this Key

The following listed species are believed to be extirpated from Georgia and are not included in this key:

- Anthony's riversnail (*Athearnia anthonyi*)
- Rusty-patched bumble bee (*Bombus affinis*)
- Pink Mucket (*Lampsilis abrupta*)
- Ovate clubshell (*Pleurobema perovatum*)
- Cumberland monkeyface (Q*uadrula intermedia*)

The following listed species do not require Section 7 consultation for federal actions in the State of Georgia:

- Bog turtle (*Glyptemys muhlenbergii)* - Listed for similarity of appearance
- Whooping crane (*Grus americana*) - Listed in Georgia as experimental/non-essential

The following listed species are covered in different DKeys and are not included in this key:

- Indiana bat (*Myotis sodalis*)
- Northern long-eared bat (*Myotis septentrionalis*)

This DKey does not include species or critical habitats that are proposed but not yet listed. Conferences are required if a proposed action is likely to jeopardize the continued existence of a proposed species or adversely modify or destroy proposed critical habitat.

7 EFFECTS OF COVERED ACTIONS AND ACTIVITIES

This section covers the effects of the anticipated activities covered in this standing analysis to the covered species and Critical Habitat. Where appropriate in our analysis, we make note of which activities are expected to have no effect on a species and Critical Habitat. This information is provided as helpful technical assistance to those agencies and project proponents who may be unfamiliar with the species and activities and can be incorporated by reference by action agencies when they make a NE determination.

The effects of the action are all consequences to listed species or Critical Habitat that are caused by the proposed action, including the consequences of other activities that are caused by the proposed action but that are not part of the action. A consequence is caused by the proposed action if it would not occur but for the proposed action and it is reasonably certain to occur. Effects of the action may occur later in time and may include consequences occurring outside the immediate area involved in the action (50 CFR 402.02).

A project's action area must include all areas affected (i.e., modifications to land, air, or water) by the proposed action, and not merely the immediate area involved in the action. If the activities satisfy the two-part test for causation ("but for" and "reasonably certain to occur"), they should be considered as part of the action. To qualify for use of this standing analysis, a project's action area must be wholly encompassed by the coverage area for this standing analysis as described above and all activities within the proposed action must fit within the scope of the standing analysis. See Ensuring an Accurate Action Area for more details.

Here, we describe the conditions and requirements that projects would need to comply with to be consistent with "may affect, not likely to adversely affect" (Table 2) or "no effect" (Table 3) determinations for the listed species covered by this DKey. "No effect" means there will be no impacts, positive or negative, on listed or proposed resources. Generally, this means no listed resources will be exposed to action and its environmental consequences. Concurrence from the Service is not required. "May affect, but not likely to adversely affect" means that all effects are beneficial, insignificant, or discountable. Beneficial effects have contemporaneous positive effects without any adverse effects to the species or habitat. Insignificant effects relate to the size of the impact and should never reach the scale where take occurs. Discountable effects are those extremely unlikely to occur. Based on best judgment, a person would not: (1) be able to meaningfully measure, detect, or evaluate insignificant effects; or (2) expect discountable effects to occur.

7.1 Activities that "May Affect, Not Likely to Adversely Affect" Listed Species and Critical Habitats

Table 2. Description of project activities covered by this determination key that would be consistent with "may affect, not likely to adversely affect" determinations for listed species and Designated Critical Habitat.

Species or Critical Habitat	Activity Description	Potential Stressor-Exposure-Response Pathway	Rationale for NLAA Determination
Freshwater aquatics species group (Table 1)	U.S. Army Corps of Engineers (USACE), Federal Highway Administration (FHWA), and Georgia Department of Transportation (GDOT) actions requiring in-water work (e.g., work that requires a Clean Water Act Section 404 permit, Rivers and Harbors Act Section 10 permit, construction, road crossings/bridges, dams, wingdikes, pilings, shoreline stabilization, dredging, dredge disposal, installation of fill, other in-stream work, etc.). Suitable habitat for federally listed aquatic species is not present within the Action Area. Activities will not occur within 300-ft of designated critical habitat for any of the freshwater aquatic species. Project will not increase impervious surfaces by ≥20-acres nor require land disturbance ≥100-acres. Project will comply with: - Georgia's Erosion and Sedimentation Control Act - Georgia Stormwater Management Manual's relevant performance standards - Metropolitan North Georgia Water Planning District model stream buffer protection ordinance (if applicable; does not apply to GDOT projects)	Stressors: Potential for direct mortality from in-water construction activities; changes to streambed substrate composition; sedimentation; more impervious surfaces leading to increased sediment and stormwater runoff; altered water quality (e.g., increased total suspended solids, increased turbidity); altered hydrologic flows; altered food web structure and resource availability; changes in upstream-downstream connectivity and/or stream-riparian connectivity; increased noise and human presence Exposure Path: Direct and indirect impacts to water quality (e.g., increased total suspended solids, increased turbidity) and habitat availability (altered hydrologic flows, substrate composition, and other characteristics) would have effects on freshwater mussels and fishes by altering their ability to access food and refugia, and affecting conditions that support important life processes including growth, spawning behaviors, and host interactions. Land-use changes may also result in increased presence and disturbance by humans, livestock, and domestic animals, artificial lighting	Suitable habitat for any of the freshwater aquatic species is not found within the action area. Therefore, the species are not likely to occur within the action area. Implementation of the BMPs outlined in this project activity should ensure that mobilized sediments and materials are limited to and maintained within the Action Area such that they will not affect other areas in the watershed (e.g., upstream or downstream).

Species or Critical Habitat	Activity Description	Potential Stressor-Exposure-Response Pathway	Rationale for NLAA Determination
		at night, noise, and similar stressors that reduce habitat quality. Responses: If an undetected individual enters or is trapped within the construction area, it may sustain injury from direct contact with construction equipment or it may experience physiological stress from changes in water quality (e.g., reduced dissolved oxygen). Changes in riparian and upland habitat may lead to changes in hydrologic flows, and influxes of nutrients, sediment, contaminants. These impacts to aquatic habitat may alter feeding, growth, reproduction, and movement behaviors with implications for population viability.	
Freshwater aquatics species group (Table 1)	U.S. Army Corps of Engineers (USACE), Federal Highway Administration (FHWA), and Georgia Department of Transportation (GDOT) actions requiring in-water work (e.g., work that requires a Clean Water Act Section 404 permit, Rivers and Harbors Act Section 10 permit, construction, road crossings/bridges, dams, wingdikes, pilings, shoreline stabilization, dredging, dredge disposal, installation of fill, other in-stream work, etc.). Suitable habitat for federally listed aquatic species is present within the Action Area. Surveys were conducted and no federally listed species were detected. Activities will not occur within 300-ft of designated critical habitat for any of the freshwater aquatic species. Project will not increase impervious surfaces by ≥20-acres nor require land disturbance ≥100-acres. Project will comply with:	Stressors: Potential for direct mortality from in-water construction activities; changes to streambed substrate composition; sedimentation; more impervious surfaces leading to increased sediment and stormwater runoff; altered water quality (e.g., increased total suspended solids, increased turbidity); altered hydrologic flows; altered food web structure and resource availability; changes in upstream-downstream connectivity and/or stream-riparian connectivity; increased noise and human presence Exposure Path: Direct and indirect impacts to water quality (e.g., increased total suspended solids, increased turbidity) and habitat availability (altered hydrologic flows, substrate composition, and other characteristics) would have	Although project activities will impact suitable habitat, targeted surveys did not detect any listed species. This suggests a low likelihood of their occupancy/presence despite there being suitable habitat in the area. Implementation of the BMPs outlined in this project activity should ensure that mobilized sediments and materials are limited to and maintained within the Action Area such that they will not affect other areas in the watershed (e.g., upstream or downstream). Any effects related to the potential stressors to aquatic

Species or Critical Habitat	Activity Description	Potential Stressor-Exposure-Response Pathway	Rationale for NLAA Determination
	- Georgia's Erosion and Sedimentation Control Act - Georgia Stormwater Management Manual's relevant performance standards - Metropolitan North Georgia Water Planning District model stream buffer protection ordinance (if applicable; does not apply to GDOT projects)	effects on freshwater mussels and fishes by altering their ability to access food and refugia, and affecting conditions that support important life processes including growth, spawning behaviors, and host interactions. Land-use changes may also result in increased presence and disturbance by humans, livestock, and domestic animals, artificial lighting at night, noise, and similar stressors that reduce habitat quality. Responses: If an undetected individual enters or is trapped within the construction area, it may sustain injury from direct contact with construction equipment or it may experience physiological stress from changes in water quality (e.g., reduced dissolved oxygen). Changes in riparian and upland habitat may lead to changes in hydrologic flows, and influxes of nutrients, sediment, contaminants. These impacts to aquatic habitat may alter feeding, growth, reproduction, and movement behaviors with implications for population viability.	species and Critical Habitat are expected to be discountable or insignificant levels.
Freshwater aquatics species group (Table 1)	Suitable habitat for federally listed aquatic species is present within the Action Area. Activities will not involve any in-water work. Activities will not occur within 300-ft of designated critical habitat for any of the freshwater aquatic species. Activities will not occur within 300-ft of aquatic habitats (i.e., perennial or intermittent stream, river, lake, pond, wet weather conveyance, wetland, spring, or habitat that could be	Stressors: Potential for indirect stressors from nearby construction activities; changes to streambed substrate composition; sedimentation; more impervious surfaces leading to increased sediment and stormwater runoff; altered water quality (e.g., increased total suspended solids, increased turbidity); altered hydrologic flows; altered food web structure and resource availability; changes in upstream-downstream	Although suitable habitat for the freshwater aquatics species group is present within the Action Area, activities will not occur within 300-ft of suitable habitat. Implementation of the BMPs outlined in this project activity should ensure that mobilized sediments and materials are limited to and maintained

Species or Critical Habitat	Activity Description	Potential Stressor-Exposure-Response Pathway	Rationale for NLAA Determination
	described as a wetland, bog, fern, stream, seep, or wet meadow). Project will not increase impervious surfaces by ≥20-acres nor require land disturbance ≥100-acres. Activities will not occur within 300-ft of designated critical habitat for any of the freshwater aquatic species. Project will comply with: - Georgia's Erosion and Sedimentation Control Act - Georgia Stormwater Management Manual's relevant performance standards - Metropolitan North Georgia Water Planning District model stream buffer protection ordinance (if applicable; does not apply to GDOT projects)	connectivity and/or stream-riparian connectivity; increased noise and human presence Exposure Path: Indirect impacts to water quality (e.g., increased total suspended solids, increased turbidity) and habitat availability (altered hydrologic flows, substrate composition, and other characteristics) would have effects on freshwater mussels and fishes by altering their ability to access food and refugia, and affecting conditions that support important life processes including growth, spawning behaviors, and host interactions. Land-use changes may also result in increased presence and disturbance by humans, livestock, and domestic animals, artificial lighting at night, noise, and similar stressors that reduce habitat quality. Responses: Individuals may experience physiological stress from changes in water quality (e.g., reduced dissolved oxygen). Changes in riparian and upland habitat may lead to changes in hydrologic flows, and influxes of nutrients, sediment, contaminants. These impacts to aquatic habitat may alter feeding, growth, reproduction, and movement behaviors with implications for population viability.	within the Action Area such that they will not affect other areas in the watershed (e.g., upstream or downstream). Any effects related to the potential stressors to aquatic species and Critical Habitat are expected to be discountable or insignificant levels.
Trispot darter	Project activities will occur within potentially suitable spawning habitat (i.e., intermittent stream or seasonally wet area, seep or seepage wetland, or ditch) but will not occur during the spawning season (January 1 through April 30) and will not permanently alter this habitat.	Stressors: Potential for direct mortality from construction activities; changes to streambed substrate composition; sedimentation; more impervious surfaces leading to increased sediment and stormwater runoff; altered water	Although suitable spawning habitat for the trispot darter is present within the Action Area, activities will not occur within that habitat during the spawning season when they

Species or Critical Habitat	Activity Description	Potential Stressor-Exposure-Response Pathway	Rationale for NLAA Determination
	Project will not increase impervious surfaces by ≥20-acres nor require land disturbance ≥100-acres. Activities will not occur within 300-ft of designated critical habitat for any of the freshwater aquatic species. Project will comply with: - Georgia's Erosion and Sedimentation Control Act - Georgia Stormwater Management Manual's relevant performance standards - Metropolitan North Georgia Water Planning District model stream buffer protection ordinance (if applicable; does not apply to GDOT projects)	quality (e.g., increased total suspended solids, increased turbidity); altered hydrologic flows; altered food web structure and resource availability; changes in upstream-downstream connectivity and/or stream-riparian connectivity; increased noise and human presence Exposure Path: Direct and indirect impacts to water quality (e.g., increased total suspended solids, increased turbidity) and habitat availability (altered hydrologic flows, substrate composition, and other characteristics) would have effects on trispot darter by altering their ability to access food and refugia, and affecting conditions that support important life processes including growth, spawning behaviors, and host interactions. Land-use changes may also result in increased presence and disturbance by humans, livestock, and domestic animals, artificial lighting at night, noise, and similar stressors that reduce habitat quality. Responses: If an undetected individual enters or is trapped within the construction area, it may sustain injury from direct contact with construction equipment or it may experience physiological stress from changes in water quality (e.g., reduced dissolved oxygen). Changes in riparian and upland habitat may lead to changes in hydrologic flows, and influxes of nutrients, sediment, contaminants. These impacts to aquatic habitat may	are likely to be occupying this habitat. The activity will not permanently alter the habitat such that it stops being suitable for the species. Implementation of the BMPs outlined in this project activity should ensure that mobilized sediments and materials are limited to and maintained within the Action Area such that they will not affect other areas in the watershed (e.g., upstream or downstream). Any effects related to the potential stressors to trispot darter and its designated Critical Habitat are expected to be discountable or insignificant levels.

Species or Critical Habitat	Activity Description	Potential Stressor-Exposure-Response Pathway	Rationale for NLAA Determination
		alter feeding, growth, reproduction, and movement behaviors with implications for population viability.	
Eastern black rail	Activities will cause direct or indirect effects to suitable habitat for eastern black rail, and: Surveys were conducted based on the Eastern Black Rail Call-Response Survey Protocol for Range-wide Monitoring protocol and eastern black rails were not detected.	Stressors: Habitat loss, degradation, and fragmentation; potential for direct mortality of undetected individuals during construction activities; increased noise and light; increased human activity Exposure Path: Disturbance or removal of habitat would reduce the species' ability to use the area for refugia, foraging, or breeding. On the coast, the encroachment of human development and sea level rise has compounding effects that reduce habitat and resource availability for the species. Responses: These stressors contribute to the species occupancy at sites and their overall population numbers. Even localized but too frequent intermittent stressors can cause reproductive failure or adult mortality, respectively. If these stressors occur at frequencies within and across generations, they could limit the ability of the eastern black rail to maintain occupancy at habitat sites and limit its ability to colonize previously occupied sites or new sites (USFWS 2019b).	Although project activities will impact suitable habitat, targeted surveys did not detect the species. This suggests a low likelihood of their occupancy/presence. This species is cryptic and challenging to detect. However, based on the best available information, the species is not likely to occur within the Action Area.
Eastern indigo snake	If project is a Georgia Department of Transportation project, and in locations with soils suitable for the eastern indigo snake: Activities (or project types) are included in the "Range wide Programmatic Biological Assessment of Effects Report for	Stressors: Habitat loss and fragmentation, direct mortality (e.g. road mortality, human persecution), invasive species, predation, and inadequate fire management	The proposed action incorporates conservation measures (i.e., "Special Provisions") that avoid or minimize stressors to the species, such that any effects should be reduced to

Species or Critical Habitat	Activity Description	Potential Stressor-Exposure-Response Pathway	Rationale for NLAA Determination
	Eastern Indigo Snake, Gopher Tortoise, and Southeast Pocket Gopher on Roadway Maintenance and Safety Projects" Special Provisions, as detailed in the above-mentioned report, will be incorporated into the project.	Exposure Path: Eastern indigo snakes are active foragers and will move long distances to find food and mates. This, along with their large body size makes them susceptible to vehicle strikes. As road density and traffic density continue to increase within eastern indigo snake populations, the risk of road mortality also increases. Many eastern indigo snake records are from sightings on roads, most of which are reported as dead on road. Degraded habitat quality has the potential to impact population resiliency by inducing stress on individuals (e.g. reduced shelter and foraging habitat), impacting breeding and reproductive success, causing direct mortality and limiting connectivity and the ability to re-colonize areas after stochastic events. Responses: Individuals may expand their home ranges and cross roads to find resources when habitat quality decreases, increasing their vulnerability to road mortality. Habitat loss or degradation can also negatively impact the ability for long-distance movement and reduce genetic exchange among populations, increasing the risk of extinction due to inbreeding and reduced capacity for evolutionary adaptation.	discountable and insignificant levels.
Eastern indigo snake	Site assessment(s) for gopher tortoise burrows were conducted, and detected gopher tortoise burrows (active, inactive, or abandoned) on site. Burrows will not be impacted.	Stressors: Fragmentation, modification, destruction, and degradation of habitat; reduced foraging resources; potential for direct impact if burrows are unintentionally collapsed; potential for	Surveys indicate that there are active, inactive, or abandoned gopher tortoise burrows within the Action Area. However, the burrows will not be impacted by the

Species or Critical Habitat	Activity Description	Potential Stressor-Exposure-Response Pathway	Rationale for NLAA Determination
	All USFWS Standard Protection Measures for the Eastern Indigo Snake, or an alternative pre-approved plan, will be implemented.	deliberate harm or killing due to misidentification for venomous snakes Exposure Path: Habitat destruction and conversion reduce the overall amount of suitable habitat available, and degradation reduces resource availability (e.g., gopher tortoise burrows and other refugia) within habitat patches (USFWS 2024). Responses: Degraded habitat quality has the potential to impact population resiliency by inducing stress on individuals (e.g. reduced shelter and foraging habitat), impacting breeding and reproductive success, causing direct mortality and limiting connectivity and the ability to re-colonize areas after stochastic events. Habitat loss or degradation can also negatively impact the ability for long-distance movement and reduce genetic exchange among populations, increasing the risk of extinction due to inbreeding and reduced capacity for evolutionary adaptation.	action, avoiding any potential direct impact on the species associated with collapsing this habitat. Furthermore, the action includes implementation of the Standard Protection Measures for the Eastern Indigo Snake to avoid and minimize potential direct impacts associated with intentional or unintentional harm or killing of the species due to misidentification. Any effects are expected to be discountable and insignificant.
Eastern indigo snake	Action Area intersects the eastern indigo snake buffer area (consisting of 5-mile occurrence buffers and/or 2.5-mile conservation population units' buffers). Site assessment(s) for gopher tortoise burrows were conducted, and did NOT detect gopher tortoise burrows (active, inactive, or abandoned) on site. All USFWS Standard Protection Measures for the Eastern Indigo Snake, or an alternative pre-approved plan, will be implemented.	Stressors: Fragmentation, modification, destruction, and degradation of habitat; reduced foraging resource availability; potential for deliberate harm or killing due to misidentification for venomous snakes Exposure Path: Eastern indigo snakes are active foragers and will move long distances to find food and mates. This, along with their large body size makes	Surveys indicate that there are no gopher tortoise burrows within the Action Area. The project will implement the Standard Protection Measures for the Eastern Indigo Snake to avoid and minimize potential direct impacts associated with intentional or unintentional harm or killing of the species

Species or Critical Habitat	Activity Description	Potential Stressor-Exposure-Response Pathway	Rationale for NLAA Determination
		them susceptible to vehicle strikes. As road density and traffic density continue to increase within eastern indigo snake populations, the risk of road mortality also increases. Habitat destruction and conversion reduce the overall amount of suitable habitat available, and degradation reduces resource availability (e.g., gopher tortoise burrows and other refugia) within habitat patches (USFWS 2024). Responses: Degraded habitat quality has the potential to impact population resiliency by inducing stress on individuals (e.g. reduced shelter and foraging habitat), impacting breeding and reproductive success, causing direct mortality and limiting connectivity and the ability to re-colonize areas after stochastic events. Degraded habitat quality can also negatively impact the ability for long-distance movement and reduce genetic exchange among populations increasing the risk of extinction due to inbreeding and reduced capacity for evolutionary adaptation.	due to misidentification. Therefore, we do not anticipate that any individuals will be impacted.
Eastern indigo snake	Action Area intersects the eastern indigo snake buffer area (consisting of 5-mile occurrence buffers and/or 2.5-mile conservation population units' buffers). Site assessment(s) detected gopher tortoise burrows (active, inactive, or abandoned) on site. Burrows will be impacted.	Stressors: Fragmentation, modification, destruction, and degradation of habitat; reduced foraging resource availability; potential for direct impact when burrows are collapsed; potential for deliberate harm or killing due to misidentification for venomous snakes	This project will result in the destruction of potential wintering habitat for the species. Targeted surveys suggest a low likelihood of occupancy/presence of the species. To Take of any undetected individuals, all

Species or Critical Habitat	Activity Description	Potential Stressor-Exposure-Response Pathway	Rationale for NLAA Determination
	An EIS survey following the USFWS Eastern Indigo Snake Survey Protocol, or an alternative pre-approved survey protocol, was completed and did not detect presence of EIS. All USFWS Standard Protection Measures for the Eastern Indigo Snake, or an alternative pre-approved plan, will be implemented.	Exposure Path: In the northern part of their range (Southeast Georgia, North Florida, and the Panhandle regions), eastern indigo snakes depend on gopher tortoise burrows and the associated habitat for winter shelter sites, breeding, nesting, and feeding (USFWS 2024). In Georgia, eastern indigo snakes have been documented to have den site fidelity, returning to the same sandhills and sometimes the same burrows over multiple winters. Responses: Habitat loss and degradation have the potential to impact population resiliency by inducing stress on individuals (e.g. reduced shelter and foraging habitat), impacting breeding and reproductive success, causing direct mortality and limiting connectivity, and the ability to re-colonize areas after stochastic events. Affecting the ability for long-distance movement would reduce genetic exchange among populations increasing the risk of extinction due to inbreeding and reduced capacity for evolutionary adaptation.	burrows will be scoped for the possible presence of the eastern indigo snake prior to collapsing the habitat. Furthermore, the action includes implementation of the Standard Protection Measures for the Eastern Indigo Snake to further minimize risk to the species. With these applied conservation measures, we can be reasonably certain that Take is not likely to occur.
Granite outcrop species group (Table 1)	Granite outcrop habitat is visible on aerial imagery and/or identified within the Action Area. Survey is conducted by a qualified botanist during the appropriate times of year for species identification using survey guidance at https://georgiabiodiversity.org/portal/table/plants/. At least one listed granite outcrop plant species is documented as present during survey.	Stressors: Crushing, exposure to stockpile materials/spoils, vegetation management activities, introduction of invasive species, dust Exposure Path: Exposure may occur through direct contact of project equipment and plants, indirect effects including dust generated landing on plant tissues or construction by-	The proposed action incorporates conservation measures that avoid or minimize stressors to the species, such that any effects should be reduced to discountable and insignificant levels. A detailed rationale is provided in Appendix C.

Species or Critical Habitat	Activity Description	Potential Stressor-Exposure-Response Pathway	Rationale for NLAA Determination
	Project will implement all Conservation Measures for Plants and Granite Outcrop Species.	products draining into granite outcrop habitat, or suitable habitat may be degraded by introduction of invasive species that outcompete granite outcrop plants or render the habitat unsuitable for granite outcrop plants. Incorporation of the BMPs physically distances the plants from the stressor activities and will reduce or eliminate exposure to stressors. Responses: Minimal reductions in fitness or instances of crushing if BMPs are not properly implemented. Draining of construction by-products is avoided or minimized; if granite outcrop plants come into contact with spoil and stockpiled materials they may be buried or experienced a negative physiological response. Vegetation management activities may elicit minor physiological distress/reduced fitness due to herbicide drift. Introduction of invasive species may lead to increased competition, altered availability of resources, and reduced fitness. The minor dust transport expected with the buffers in place may result in short-term stomatal closure, minor physiological stress.	
Gray bat	Action Area does not contain features that potentially provide undocumented hibernacula and/or roosting habitat for gray bats (i.e. bridges, culverts, undocumented caves, karst geology). Action Area is not located within 0.5 mile of a known gray bat record or known cave. Project activities will not involve:	Stressors: Increased human activity, noise, artificial light pollution, forested or stream habitat loss or fragmentation Exposure Path: Bats may inhabit the area as a movement corridor, daytime refugia, or to forage. Responses: Bats may either be attracted to (e.g., artificial lighting) or avoid the	Potential hibernacula/roost habitat is not found within the Action Area and other suitable habitat (e.g., foraging, movement corridor) will not be impacted in such a way that makes it unsuitable for the species. The conditions included in the activity ensure

Species or Critical Habitat	Activity Description	Potential Stressor-Exposure-Response Pathway	Rationale for NLAA Determination
	- Contaminants in the environment (e.g., leachate pond, pits containing chemicals that are not compliant with NSF/ANSI Standard 60: Drinking Water Treatment Chemicals – Health Effects) - Construction or operation of wind turbines - Increase in impervious surface	area during and after construction. Permanent impacts on forest and/or stream habitat may reduce prey and water resource availability and affect the suitability and connectivity of habitats in the area.	that any effects on gray bats are insignificant and discountable.
Gray bat	Action Area contains features that potentially provide undocumented hibernacula and/or roosting habitat for gray bats (i.e. bridges, culverts, undocumented caves, karst geology). Action Area is not located within 0.5 mile of a known gray bat record or known cave. Project activities will not involve: - Maintenance, alteration, and/or removal of an existing structure - Contaminants in the environment (e.g., leachate pond, pits containing chemicals that are not compliant with NSF/ANSI Standard 60: Drinking Water Treatment Chemicals – Health Effects) - Construction or operation of wind turbines	Stressors: Reduced roost/hibernacula habitat suitability, increased human activity, noise, artificial light pollution, forested or stream habitat loss or fragmentation Exposure Path: Bats may inhabit the area as a movement corridor, daytime refugia, nighttime or maternity roost/hibernacula or to forage. Responses: Bats may either be attracted to or avoid the Action Area during and after construction. Any temporary or permanent impacts on forest and/or stream habitat may reduce prey and water resource availability and affect the suitability and connectivity of habitats in the area. Environmental changes surrounding potential hibernacula and/or roosting habitat may affect habitat quality.	Potential hibernacula/roost habitat is present within the Action Area, but activities will avoid any impacts that would make it unsuitable for the species. The conditions included in the activity ensure that any effects on gray bats are expected to be insignificant and discountable.
Gray bat	Action Area contains features that potentially provide undocumented hibernacula and/or roosting habitat for gray bats (i.e. bridges, culverts, undocumented caves, karst geology). Action Area is not located within 0.5 mile of a known gray bat record or known cave. Project activities are associated with maintenance, alteration, and/or removal of an existing structure.	Stressors: Modification or destruction of roost/hibernacula habitat, increased human activity, noise, artificial light pollution, forested or stream habitat loss and/or fragmentation Exposure Path: Bats may inhabit the area as a movement corridor, daytime refugia, nighttime or maternity roost/hibernacula or to forage. If suitable	Although potential hibernacula/roost habitat is present within the Action Area, recent surveys did not detect evidence of occupancy of potential roost structures, and the area is not within 0.5-mile buffer of any known records or caves. Altogether

Species or Critical Habitat	Activity Description	Potential Stressor-Exposure-Response Pathway	Rationale for NLAA Determination
	Bat surveys of any existing structure(s) (bridges, culverts, buildings, bunkers, etc.) were conducted within the last two years and no bats or evidence of bats were found on, within, or around the structure. Project will require drilling or boring activities. Preliminary surveys were conducted to ensure karst voids or other voids will not be impacted. Project activities will not involve: - Land disturbance that may result in discharge of sediment into a stream; - Contaminants in the environment (e.g., leachate pond, pits containing chemicals that are not compliant with NSF/ANSI Standard 60: Drinking Water Treatment Chemicals – Health Effects) - Construction or operation of wind turbines.	hibernacula/roosting habitat is altered or removed, this reduces the likelihood that the area could support the species during its sensitive overwintering and maternity periods. Responses: Bats may either be attracted to or avoid the area during and after construction. Any temporary or permanent impacts on forest and/or stream habitat may reduce prey and water resource availability and affect the suitability and connectivity of habitats in the area. Environmental changes surrounding potential hibernacula and/or roosting habitat may affect habitat quality.	this suggests a low likelihood of occupancy/presence. Karst and other voids and streams, which represent potential habitat for the gray bat, will not be impacted by the action. Therefore, any effects on the species are expected to be insignificant or discountable.
Gray bat	Action Area may contain features that potentially provide undocumented hibernacula and/or roosting habitat for gray bats (i.e. bridges, culverts, undocumented caves, karst geology), and: Action Area is not located within 0.5 mile of a known gray bat record or known cave. Project activities are associated with maintenance, alteration, and/or removal of an existing structure. Bat surveys of any existing structure(s) (bridges, culverts, buildings, bunkers, etc.) were conducted within the last two years and no bats or evidence of bats were found on, within, or around the structure. Project activities will involve land disturbance activities that may result in discharge of sediment into a stream. Project will implement erosion and sedimentation control Best Management Practices in compliance with the Georgia Erosion and Sedimentation Control Act.	Stressors: Modification or destruction of roost/hibernacula habitat, increased human activity, noise, artificial light pollution, forested or stream habitat loss and/or fragmentation, altered water quality Exposure Path: Bats may inhabit the area as a movement corridor, daytime refugia, nighttime or maternity roost/hibernacula or to forage. Activities will impact drinking water resources for the species. If suitable hibernacula/roosting habitat is altered or removed, this reduces the likelihood that the area could support the species during its sensitive overwintering and maternity periods. Responses: Bats may either be attracted to (e.g., artificial lighting) or avoid the area during and after construction. Any temporary or permanent impacts on	Although potential hibernacula/roost habitat is present within the Action Area, recent surveys did not detect evidence of occupancy of potential roost structures, and the area is not within 0.5-mile buffer of any known records or caves. Altogether this suggests a low likelihood of occupancy/presence. Furthermore, project activities will not alter the potential roost habitat in a way to make it unsuitable for the species in the future. Project activities may indirectly impact foraging habitat (e.g., sediment inputs to streams); however, erosion

Species or Critical Habitat	Activity Description	Potential Stressor-Exposure-Response Pathway	Rationale for NLAA Determination
	Project activities will not involve: - Drilling or boring - Contaminants in the environment (e.g., leachate pond, pits containing chemicals that are not compliant with NSF/ANSI Standard 60: Drinking Water Treatment Chemicals – Health Effects) - Construction or operation of wind turbines. - Increased impervious surface	forest and/or stream habitat may reduce prey and water resource availability and affect the suitability and connectivity of habitats in the area. Environmental changes surrounding potential hibernacula and/or roosting habitat may affect habitat quality.	and sediment control BMPs will be implemented. These measures help ensure that any effects on gray bats are expected to be insignificant and discountable.
Gray bat	Action Area may contain features that potentially provide undocumented hibernacula and/or roosting habitat for gray bats (i.e. bridges, culverts, undocumented caves, karst geology), and: Action Area is not located within 0.5 mile of a known gray bat record or known cave. Project activities are associated with maintenance, alteration, and/or removal of an existing structure. Bat surveys of any existing structure(s) (bridges, culverts, buildings, bunkers, etc.) were conducted within the last two years and no bats or evidence of bats were found on, within, or around the structure. Project activities will involve land disturbance activities that may result in discharge of sediment into a stream as well as increased impervious surfaces. Project will implement erosion and sedimentation control Best Management Practices (BMPs) in compliance with the Georgia Erosion and Sedimentation Control Act and BMPs necessary to comply with water quality performance criteria in the Georgia Stormwater Management Manual. Project activities will not involve: - Drilling or boring - Contaminants in the environment (e.g., leachate pond, pits containing chemicals that are not compliant with NSF/ANSI Standard 60: Drinking Water Treatment Chemicals – Health Effects)	<u>Stressors:</u> Modification or destruction of roost/hibernacula habitat, increased human activity, noise, artificial light pollution, forested or stream habitat loss and/or fragmentation, increased impervious surfaces leading to altered water quality <u>Exposure Path:</u> Bats may inhabit the area as a movement corridor, daytime refugia, nighttime or maternity roost/hibernacula or to forage. Activities will impact drinking water resources for the species. If suitable hibernacula/roosting habitat is altered or removed, this reduces the likelihood that the area could support the species during its sensitive overwintering and maternity periods. <u>Responses:</u> Bats may either be attracted to or avoid the area during and after construction. Any temporary or permanent impacts on forest and/or stream habitat may reduce prey and water resource availability and affect the suitability and connectivity of habitats in the area. Environmental changes surrounding potential hibernacula	Although potential hibernacula/roost habitat is present within the Action Area, recent surveys did not detect evidence of occupancy of potential roost structures, and the area is not within 0.5-mile buffer of any known records or caves. Altogether this suggests a low likelihood of occupancy/presence. Furthermore, project activities will not alter the potential roost habitat in a way to make it unsuitable for the species in the future. Project activities may indirectly impact foraging habitat (e.g., sediment inputs to streams); however, erosion and sediment control and stormwater management BMPs will be implemented. These measures help ensure that any effects on gray bats are expected to be

Species or Critical Habitat	Activity Description	Potential Stressor-Exposure-Response Pathway	Rationale for NLAA Determination
	- Construction or operation of wind turbines.	and/or roosting habitat may affect habitat quality.	insignificant and discountable.
Plants species group (Table 1)	Action Area contains suitable habitat for at least one of the plant species (excluding granite outcrop species). However, project activities (including staging equipment) will not occur within suitable habitat.	Stressors: Introduction of invasive species, soil compaction and erosion, increased impervious surfaces (altered hydrology and nutrients), increased ambient temperatures and light Exposure Path: Although their immediate habitat is not affected by project activities, the surrounding areas may be impacted, with potential implications on the amount of water, nutrients, contaminants, light, and temperature of the species' habitats. Introduction of invasive species in the surrounding areas may also lead to encroachment into suitable habitat. Responses: These changes have the potential to affect the long-term suitability of the plants' habitats.	Suitable habitat, although present within the Action Area, will be entirely avoided by project activities. Therefore, we expect any effects on the species are expected to be insignificant or discountable.
Plants species group (Table 1)	Action Area contains suitable habitat for at least one of the plant species (excluding granite outcrop species): A targeted survey was conducted by a qualified botanist during the appropriate times of year for identification and none of the protected plant species were found during the survey.	Stressors: Soil compaction and erosion, vegetation management activities, introduction of invasive species, increased impervious surfaces (altered hydrology and nutrients), increased ambient temperatures and light Exposure Path: Exposure is limited as the plant is not likely to be present in the Action Area based on survey results. Potential exposures if there is undetected presence of the species includes direct impact by machinery, equipment, materials, soil compaction, increased exposure to dust, etc. Habitat changes or species introductions may	Although project activities may impact suitable habitat, targeted surveys did not detect the species. This suggests a low likelihood of their occupancy/presence. Any effects are expected to be discountable and insignificant.

Species or Critical Habitat	Activity Description	Potential Stressor-Exposure-Response Pathway	Rationale for NLAA Determination
		increase competition or may change physical or biological characteristics of the site the plants are adapted to. Responses: Responses are not expected based on negative survey results but if individuals were undetected by surveys: Damage or removal of plant tissue may reduce fitness or cause mortality. Soil compaction may harm plants by altering rooting conditions, leading to decreased germination, reduced seedling emergence, and impaired nutrient and water uptake. Dust can inhibit photosynthesis by blocking sunlight and causing stomatal closure, resulting in physiological distress. Activities like vegetation removal, mowing, and mechanical management within protected habitats may directly injure listed plants, introduce competition, or alter site conditions, potentially leading to reduced fitness and recruitment. Additionally, invasive species can increase competition and divert resources from protected species, further impacting their health and survival.	
Plants species group (Table 1)	Action Area contains suitable habitat for at least one of the plant species (excluding granite outcrop species): A targeted survey was conducted by a qualified botanist during the appropriate times of year for identification and at least one covered plant species (excluding granite outcrop species) was found during the survey. Project will implement all Conservation Measures for Plants.	Stressors: Direct impact, soil compaction, vegetation management activities, introduction of invasive species (additional competition, altered habitat characteristics, disease, herbivory), increased impervious surfaces (altered hydrology and nutrients), increased ambient temperatures and light	Targeted surveys found that the Action Area does support at least one listed plant species. However, the proposed action incorporates conservation measures that avoid or minimize stressors to the species, such that any effects should be reduced to

Species or Critical Habitat	Activity Description	Potential Stressor-Exposure-Response Pathway	Rationale for NLAA Determination
		Exposure Path: Vegetation removal, mowing, management of plants using mechanical devices, restoration, seeding, or replanting within suitable habitat may directly injure listed plants, introduce competition, or may change physical or biological characteristics of the site the plants are adapted to. Habitat may be degraded by introduction of invasive species that outcompete listed plants, alter physical or biological characteristics of the site, introduce novel diseases, and increase herbivory. Responses: Physiological stress associated with environmental changes and increased competition, or reduced habitat quality	discountable and insignificant levels.
Red-cockaded woodpecker	If project activities will remove suitable foraging habitat located within 0.5 mile of suitable nesting habitat: All suitable RCW nesting habitats within 0.5 mile of the Action Area were surveyed for the presence of RCW cavity trees following the 2003 RCW Recovery Plan Appendix 4 Survey Protocol; and red-cockaded woodpecker cavity trees were not observed.	Stressors: Habitat loss and fragmentation, reduced prey availability, increased human activity, noise Exposure Path: Since there is suitable nesting habitat within 0.5 mile of the Action Area, RCWs travel from surrounding habitat to forage there. Response: RCWs must have sufficient foraging resources to persist. Loss of foraging habitat leads to smaller group sizes especially in already fragmented, isolated, or small populations. This may reduce the long-term viability of the population.	Activities will remove or disturb suitable foraging habitat for the red-cockaded woodpecker. Surveys suggest a low likelihood of presence/occupancy. Therefore, we expect that the project activities will have an insignificant or discountable effect on the species.
Red-cockaded woodpecker	Project activities will remove and/or disturb suitable foraging and nesting habitat. All suitable RCW nesting habitats within 0.5 mile of the Action Area were surveyed following the 2003 RCW Recovery Plan	Stressors: Habitat loss and fragmentation, reduced prey availability, increased human activity, noise	Activities will remove or disturb suitable foraging and nesting habitat for the red-cockaded woodpecker.

Species or Critical Habitat	Activity Description	Potential Stressor-Exposure-Response Pathway	Rationale for NLAA Determination
	Appendix 4 Survey Protocol; and red-cockaded woodpecker cavity trees were observed. The project will not involve: - Removal or damage to (i.e., via root compaction, soil compaction, etc.) red-cockaded woodpecker cavity tree(s). - Disturbance within a cluster boundary during the nesting season or prior to one hour after sunrise and/or after one hour before sunset outside the breeding season (i.e., seismic activity, all-terrain vehicle and other off-road vehicle use, motorized equipment, etc.); A foraging habitat analysis must confirm that an adequate amount of foraging habitat will remain for each RCW group under post-project conditions.	Exposure Path: Since there is suitable and occupied nesting habitat within 0.5 mile of the Action Area, RCWs are likely to travel from surrounding habitat to forage in the area that will experience impacts. Responses: RCW will abandon clusters if sufficient suitable cavities are not available. Cluster abandonment can lead directly to population extirpation (Costa and Escano 1989), because populations of RCW are regulated by the number of potential breeding groups rather than by annual variation in reproduction and survival (Walters 1991), and because natural formation of new clusters is very slow at least under conditions of relatively young forests and small populations. RCWs must have sufficient foraging resources to persist. Loss of foraging habitat leads to smaller group sizes especially in already fragmented, isolated, or small populations. Access to prey resources is essential to supporting reproduction and survival. RCWs would need to travel further and likely across large open areas to access enough food, which increases energetic cost and vulnerability to predators.	However, the project will not involve removal or damage to cavity trees, disturbance that could impact nesting success, and will ensure that the population is left with enough foraging habitat to persist. Therefore, we expect that the project activities will have an insignificant or discountable effect on the species.
Suwannee alligator snapping turtle	Suitable habitat is present within the Action Area. Project activities will not result in impacts directly to suitable habitat or impacts within 50 feet of a stream. Project will comply with: - Georgia's Erosion and Sedimentation Control Act	Stressors: Upland and riparian habitat alteration or degradation, increased impervious surfaces, minimal water quality impacts due to erosion, sedimentation, and increases in total suspended solids, increased egg	Activities do not directly impact suitable habitat for feeding, breeding, or sheltering as they are not occurring within suitable habitat.

Species or Critical Habitat	Activity Description	Potential Stressor-Exposure-Response Pathway	Rationale for NLAA Determination
	- Georgia Stormwater Management Manual's relevant performance standards - Metropolitan North Georgia Water Planning District model stream buffer protection ordinance (if applicable; does not apply to GDOT projects).	predation risk, increased human activity, noise and artificial light pollution Exposure Path: The species may be breeding, sheltering, or foraging in the Action Area during and post-construction. Changes to water quality associated with increased sediment and stormwater runoff may affect habitat quality and prey resource availability. Increased human presence and associated environmental changes (e.g., noise, light, predator attraction) may affect nesting behavior and success. Responses: Project activities are sufficiently far from the Suwannee alligator snapping turtle and its habitat that no exposure or minimal indirect impacts to feeding or breeding habitat is expected. If nesting habitat is impacted by environmental stressors, this may reduce nesting success and juvenile survival with implications on population viability. Water quality impacts may alter prey resources availability and quality.	Implementation of the BMPs outlined in this project activity should ensure that mobilized sediments and materials are limited to and maintained within the Action Area such that they will not affect other areas in the watershed (e.g., upstream or downstream), greatly reducing the potential for direct or indirect impacts to suitable habitat and food species from erosion, sedimentation, or increases in total suspended solids. Any effects related to the potential stressors to the species should be reduced to discountable and insignificant levels.
Suwannee alligator snapping turtle	Suitable habitat is present within the Action Area, and the action will involve impacts within 50 feet of a stream. Activities will occur entirely within the months of September-March (outside of the nesting season, which is April to August). Project will comply with: - Georgia's Erosion and Sedimentation Control Act - Georgia Stormwater Management Manual's relevant performance standards	Stressors: Aquatic, riparian, and upland habitat disturbance and degradation, increased impervious surfaces, minimal water quality impacts due to erosion, sedimentation, and increases in total suspended solids, increased egg predation risk, increased human activity, noise and artificial light pollution Exposure Path: The species may be sheltering or foraging in the area during construction and may also use the area to breed and lay eggs post-construction	Activities will occur within suitable habitats for the Suwannee alligator snapping turtle. However, they will entirely avoid the nesting season. Implementation of the BMPs outlined in this project activity should ensure that mobilized sediments and materials are limited to and maintained within the Action Area such

Species or Critical Habitat	Activity Description	Potential Stressor-Exposure-Response Pathway	Rationale for NLAA Determination
	- Metropolitan North Georgia Water Planning District model stream buffer protection ordinance (if applicable; does not apply to GDOT projects).	during their nesting season. Changes to water quality associated with increased sediment and stormwater runoff may affect habitat quality and prey resource availability. Changes to riparian habitat within 50 ft of the stream may affect nesting behavior and success. Increased human presence and associated environmental changes (e.g., noise, light, predator attraction) may also affect nesting behavior and success. Responses: If nesting habitat is impacted by direct or environmental stressors, this may reduce nesting success and juvenile survival with implications on population viability. Water quality impacts may alter prey resources availability and quality.	that they will not affect other areas in the watershed (e.g., upstream or downstream), greatly reducing the potential for direct or indirect impacts to suitable habitat and food species from erosion, sedimentation, or increases in total suspended solids. Any effects related to the potential stressors to the species should be reduced to discountable and insignificant levels.
West Indian manatee	Projects include marina or dock activities within tidal waters and will follow the USACE Savannah District/FWS-GA Programmatic Manatee Agreement and its applicable conditions: Recreational docks would apply conditions A through J. Community and commercial marinas would apply conditions A through P.	Stressors: Slow moving mechanical equipment, construction materials, turbidity, water quality impacts, habitat alteration, noise, reduced food availability, increased boat traffic, increased human activity, and strikes with slow moving motorized vessels. Exposure Path: No expected exposure while project work is being completed as work should cease when manatees are observed in the action area, however there is the potential for impacts to manatees if they are present but not observed. Potential for increased exposure to human activities post-project.	The proposed action incorporates conservation measures (i.e., "Manatee Special Permit Conditions") that avoid or minimize stressors to the species, such that any effects should be reduced to discountable and insignificant levels (Appendix B).

Species or Critical Habitat	Activity Description	Potential Stressor-Exposure-Response Pathway	Rationale for NLAA Determination
		Responses: If a manatee enters a project area and exposure to project activities occurs, there is the potential for manatee to alter behavior to avoid or inspect activities, or it may sustain injury.	
West Indian manatee	Construction, modification, or maintenance of a water access facility other than a dock or marina facility (e.g. public boat ramp, fishing pier, etc.) following the Manatee Special Permit Conditions A through M from the USACE Savannah District/FWS-GA Programmatic Manatee Agreement.	Stressors: Slow moving mechanical equipment, construction materials, turbidity, water quality impacts, habitat alteration, noise, reduced food availability, increased boat traffic, increased human activity, and strikes with slow moving motorized vessels. Exposure Path: No expected exposure while project work is being completed as work should cease when manatees are observed in the action area, however there is the potential for impacts to manatees if they are present but not observed. Potential for increased exposure to human activities post-project. Responses: If exposure occurs and a manatee enters project area there is a small likelihood manatee will alter behavior to avoid or inspect activities, or it may sustain injury.	The proposed action incorporates conservation measures (i.e., "Manatee Special Permit Conditions") that avoid or minimize stressors to the species, such that any effects should be reduced to discountable and insignificant levels (Appendix B).
West Indian manatee	In-water construction or other project activities (e.g., bulkhead construction or repair, rip-rap, bridge, dredging, mooring buoys) applying the Manatee Special Permit Conditions A through K from the USACE Savannah District/FWS-GA Programmatic Manatee Agreement.	Stressors: Slow moving mechanical equipment, construction materials, turbidity, water quality impacts, habitat alteration, noise, reduced food availability, increased boat traffic, increased human activity, and strikes	The proposed action incorporates conservation measures (i.e., "Manatee Special Permit Conditions") that avoid or minimize stressors to the species, such that any effects should be reduced to discountable and

Species or Critical Habitat	Activity Description	Potential Stressor-Exposure-Response Pathway	Rationale for NLAA Determination
		with slow moving motorized vessels. Exposure Path: No expected exposure while project work is being completed as work should cease when manatees are observed in the action area, however there is the potential for impacts to manatees if they are present but not observed. Potential for increased exposure to human activities post-project. Responses: If exposure occurs and a manatee enters project area there is a small likelihood manatee will alter behavior to avoid or inspect activities, or it may sustain injury.	insignificant levels (Appendix B).

7.2 Activities consistent with "No Effect" Determinations for Listed Species and Critical Habitats

Table 3. Description of project activities covered by this determination key that would be considered to have No Effect on listed species and their Designated Critical Habitats.

Species or Critical Habitat	Activity Description	Rationale for NE Determination
All species covered by this DKey (Table 1)	U.S. Department of Agriculture Farm Service Agency (USDA-FSA) activities under the Emergency Conservation Program (ECP), Emergency Forest Restoration Program (EFRP), Farm Storage Facility Loan (FSFL) Program, Tree Assistance Program (TAP), or an FSA Loan Program, including: • Construction of barns, poultry houses, and other structures • Repair, improvement, or minor modifications (fence installation and repair, farm-related structure improvement or repair) • Conversion from one agricultural product to another • Well drilling, with or without heavy use area • Debris removal, with or without stump removal • Fence replacement • Prescribed burning Activities must not involve: (a) tree-cutting, clearing, or disturbance of land not currently in agricultural production, including forested and scrub-shrub areas; (b) impact to wetlands, streams, or riparian buffers; (c) alteration or degradation of sandhill habitat; (d) alteration or degradation of granite outcrop habitat.	Either suitable habitat is not present within the Action Area, or project activities will entirely avoid any disturbance or alteration to suitable habitat. Therefore, we can be reasonably certain that the project will have no effect on listed species or their Critical Habitat.

Species or Critical Habitat	Activity Description	Rationale for NE Determination
All species covered by this DKey (Table 1)	Communication tower requiring Federal Communication Commission (FCC) authorization or other Federal agency approval, and involving either: - Construction of a new communication tower less than 200 feet above ground level in height and without guy wires, - Co-location of antennas on existing communication towers or other structures that will not result in the increase of tower height above 350 feet above ground level - Repair, maintenance or relicensing of existing structures Tower design and operation will follow the most current Federal Aviation Administration (FAA) Obstruction Marking and Lighting Advisory Circular (AC 70/7460-1M). All activities will either be located entirely within previously disturbed, urbanized or developed areas, or within areas that do not represent potential habitat for federally protected species, or will not involve any modification, ground disturbance, tree clearing, or construction.	The project will implement all recommended BMPs for communication tower projects as listed in the activity description. All activities are located entirely within previously disturbed, urbanized or developed areas or within areas that do not represent suitable habitat for federally protected species. Therefore, listed species and their Critical Habitat are not expected to occur within the Action Area.
All species covered by this Dkey (Table 1)	Relicensing of an existing communication tower requiring authorization by the Federal Communication Commission (FCC) authorization and/or other Federal agency; adhering to the most current Federal Aviation Administration (FAA) Obstruction Marking and Lighting Advisory Circular (AC 70/7460-1M), and project activities will not involve any modification, ground disturbance, tree clearing, or construction.	The project will implement all recommended BMPs for communication tower projects as listed in the activity description. Project activities will not involve any new modification, ground disturbance, tree clearing, or construction, and therefore, will not impact suitable habitat for listed species or modify their Critical Habitat.
Eastern black rail	Action Area does not include suitable habitat for the eastern black rail.	Suitable habitat for the species is not present in the action area; therefore, the species is not expected to occur within the Action Area.
Eastern black rail	Action Area includes suitable habitat for eastern black rail, but activities will not cause direct or indirect effects to the species' habitat.	Action and activities will not directly or indirectly impact suitable habitat. Therefore, we can be reasonably certain that the action will have no effect on the species.
West Indian manatee	Project activities will not occur within tidal waters accessible to West Indian manatees.	Action and activities will not directly or indirectly impact suitable habitat. Therefore, we can be reasonably certain that the action will have no effect on the species.

Species or Critical Habitat	Activity Description	Rationale for NE Determination
Freshwater Aquatics species group (Table 1); Suwannee alligator snapping turtle	Suitable habitat for federally listed aquatic species is not present within the Action Area. Activities will not involve any in-water work. Activities will not occur within 300-ft of designated critical habitat for any of the freshwater aquatic species. Activities will not occur within 300-ft of aquatic habitats (i.e., perennial or intermittent stream, river, lake, pond, wet weather conveyance, wetland, spring, or habitat that could be described as a wetland, bog, fern, stream, seep, or wet meadow). Project will not increase impervious surfaces by greater than 20-acres nor require land disturbance of greater than 100-acres. Activities will not occur within 300-ft of designated critical habitat for any of the freshwater aquatic species. Project will comply with: - Georgia's Erosion and Sedimentation Control Act - Georgia Stormwater Management Manual's relevant performance standards - Metropolitan North Georgia Water Planning District model stream buffer protection ordinance (if applicable; does not apply to GDOT projects).	Suitable habitat for the species is not present in the action area; therefore, the species is not expected to occur within the Action Area.
Sea turtles species groups (Table 1)	Action will not impact Georgia's coastal beaches, sandy north/south island ends, or associated dunes. Action area is located within 15-miles of sea turtle nesting habitat and will not include the addition of artificial lighting at night during the nesting season.	Action and activities will not directly or indirectly impact suitable habitat. Therefore, we can be reasonably certain that the action will have no effect on the species.
Sea turtles species groups (Table 1)	Action will not impact Georgia's coastal beaches, sandy north/south island ends, or associated dunes. Action area is located greater than 15-miles away from sea turtle nesting habitat and will not include the addition of greater than 1 acre of artificial lighting at night during the nesting season.	Action and activities will not directly or indirectly impact suitable habitat. Therefore, we can be reasonably certain that the action will have no effect on the species.
Shorebirds species group (Table 1)	Action will not impact Georgia's coastal beaches, sandy north/south island ends, or associated dunes.	Action and activities will not directly or indirectly impact suitable habitat. Therefore, we can be reasonably certain that the action will have no effect on the species.

Species or Critical Habitat	Activity Description	Rationale for NE Determination
Red-cockaded woodpecker	Project will not involve removal of suitable red-cockaded woodpecker foraging habitat. Note: Suitable foraging habitat consists of a pine or pine/hardwood stand of forest, woodland, or savannah in which 50 percent or more of the dominant trees are pines and the dominant pine trees are generally 30 years of age or older (2003 RCW Recovery Plan Appendix 4. Survey Protocol). Trees 60 years of age or older are suitable nesting habitat.	Suitable habitat for the species will not be affected by project activities.
Red-cockaded woodpecker	Project will involve removal of suitable red-cockaded woodpecker foraging habitat. However, no suitable nesting habitat for red-cockaded woodpecker (pine or pine/hardwood stands that contain pines 60 years of age or older) is found within 0.5 mile of the action area.	Suitable habitat is present in the action area but is not likely to be occupied by the species.
Reticulated flatwoods salamanders and Designated Critical Habitat	Action Area does not overlap with Critical Habitat for reticulated flatwoods salamander AND at least one of the following conditions must be met: - All project activities will be located entirely within previously disturbed, urbanized or developed areas or within areas that do not represent potential habitat for federally protected species. - The proposed project does not include new construction or ground disturbance. - Activities will not impact longleaf pine-wiregrass flatwoods or slash pine flatwoods.	Suitable habitat for the species is not present in the action area or will not be impacted; therefore, the species is not expected to occur within the Action Area.
Frosted flatwoods salamander and Designated Critical Habitat	Action Area does not overlap with Critical Habitat for frosted flatwoods salamander AND at least one of the following conditions must be met: - All project activities will be located entirely within previously disturbed, urbanized or developed areas or within areas that do not represent potential habitat for federally protected species. - The proposed project does not include new construction or ground disturbance. - Activities will not impact longleaf pine-wiregrass flatwoods or slash pine flatwoods.	Suitable habitat for the species is not present in the action area or will not be impacted; therefore, the species is not expected to occur within the Action Area.
Plants species group (Table 1)	Action Area does not include suitable habitat for any of the plant species (excluding granite outcrop species).	Suitable habitat for the species is not present in the action area; therefore, the species is not expected to occur within the Action Area.
Granite outcrop species group (Table 1)	Action Area is more than 0.25-mile buffer distance from any known occupied outcrops and granite outcrop habitat is not visible on aerial imagery or present within the Action Area.	Suitable habitat for the species is not present in the action area or within a 0.25-mile buffer distance; therefore, the species is not expected to occur within the Action Area.

Species or Critical Habitat	Activity Description	Rationale for NE Determination
Granite outcrop species group (Table 1)	Georgia Department of Transportation projects where all project activities are listed in "Table 1.A. Programmatic 'No Effect' Activities" of the "Standard Operating Procedures for Programmatic Determinations for Listed Species" of the "Joint Coordination Procedures Among the Federal Highway Administration, Georgia Division, U.S. Fish and Wildlife Service Georgia Ecological Services Office, Georgia Department of Natural Resources, and Georgia Department of Transportation for Streamlining Interagency Coordination and Consultation under the Endangered Species Act, Fish and Wildlife Coordination Act, Migratory Bird Treaty Act, Bald and Golden Eagle Protection Act, Georgia Wildflower Preservation Act, and Georgia Endangered Wildlife Act."	Activities are to take place entirely within the roadway and existing right-of-way. Suitable habitat for the species is not present in the action area or will not be impacted; therefore, the species is not expected to occur within the Action Area.
Eastern indigo snake	Georgia Department of Transportation projects where all project activities are listed in "Table 1.A. Programmatic 'No Effect' Activities" of the "Standard Operating Procedures for Programmatic Determinations for Listed Species" of the "Joint Coordination Procedures Among the Federal Highway Administration, Georgia Division, U.S. Fish and Wildlife Service Georgia Ecological Services Office, Georgia Department of Natural Resources, and Georgia Department of Transportation for Streamlining Interagency Coordination and Consultation under the Endangered Species Act, Fish and Wildlife Coordination Act, Migratory Bird Treaty Act, Bald and Golden Eagle Protection Act, Georgia Wildflower Preservation Act, and Georgia Endangered Wildlife Act."	Activities are to take place entirely within the roadway and existing right-of-way.
Eastern indigo snake	Georgia Department of Transportation project types listed in the "Range wide Programmatic Biological Assessment of Effects Report for Eastern Indigo Snake, Gopher Tortoise, and Southeast Pocket Gopher on Roadway Maintenance and Safety Projects", and there are no soils suitable for the eastern indigo snake in the Action Area.	Surveys found that suitable habitat for the species is not present in the action area; therefore, the species is not expected to occur within the Action Area.
Eastern indigo snake	The Action Area does not intersect the eastern indigo snake buffer area (consisting of 5-mile occurrence buffers and 2.5-mile conservation population units' buffers), and site assessment(s) did not detect gopher tortoise burrows (active, inactive, or abandoned) on site.	The Action Area does not provide preferred or suitable habitat based on habitat suitability modeling (Bauder et al. 2022) and surveys did not detect any gopher tortoise burrows on site. Therefore, eastern indigo snakes are not expected to occur within the Action Area.

8 SUMMARY AND CONCLUSION

After considering the relevant information pertaining to the species and Critical Habitat, reviewing the covered activities and associated required conservation measures, and evaluating their anticipated effects), we conclude that the actions subject to this standing analysis will support a federal action agency determination of "no effect" or support a section 7(a)(2) determination pursuant to the Act of "may affect, not likely to adversely affect," as appropriate, for the subject species and Critical Habitat as described above. This standing analysis is based on the consultation provisions of section 7(a)(2) of the Act and the information cited and will undergo review and revision, as needed, if any of the following conditions have been met: 1) If new information reveals the effects of the covered action(s) to the covered species or Critical Habitat are occurring in a manner or to an extent not considered in this standing analysis based on applied use; or 2) If the species or Critical Habitat covered by the standing analysis has a change in status.

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10 APPENDIX A: INITIAL QUALIFYING QUESTIONS FOR DKEY

1. As a representative of this project, do you agree that all information submitted will represent the complete scope of the project and that you will answer all questions truthfully?
2. Does the proposed project include, or is it reasonably certain to cause, intentional take of listed species?
3. Does the project require Coastal Barrier Resources Act consultation?
4. Will this project require an Individual Permit under Section 404 of the Clean Water Act?
5. Will this project involve any new point source discharge into a stream or change to an existing point source discharge (e.g., outfalls; leachate ponds)?
6. Will this project involve any new surface or groundwater withdrawals?
7. Are you initiating emergency consultation under Executive Order 14156 (Declaring a National Energy Emergency)?
8. Will the project result in new temporary or permanent impacts to habitat within Georgia's coastal beaches, sandy north/south island ends, or associated dunes? Note: Impacts may include but are not limited to artificial lighting at night (i.e., existing lighting now made visible from the beach, installation of new lighting, or

skyglow), beach nourishment, sand scraping, armoring, or other activities requiring heavy equipment on the beach.

9. Will this project involve blasting or any other detonation activity (e.g., for channel deepening and/or widening, geotechnical surveys or exploration, bridge and structure removals, movies, military shows, or special events), excluding fireworks displays?
10. Will this project involve new or increased use of public recreational off-highway vehicle (OHV) trails?
11. Will this project involve resource extraction (e.g., mining, oil/gas, logging) or associated exploration activities?
12. Will this project involve dredging, in-stream gravel/sand mining, or removal of large wood?
13. Will this project involve activities that will alter streamflow, such as hydropower energy production, impoundments, intake structures, diversion structures, and/or turbines?
14. Will the project involve construction or development of a data center or related infrastructure (e.g., server farm, computer campus, technology campus, cloud infrastructure, digital infrastructure, IT operations center)?
15. If the project is within the 15-mi buffer around the loggerhead sea turtle current range, will the project include the addition of >=1 acre of permanent or temporary artifical lighting at night (sunset to sunrise) between May 1 and October 31 (sea turtle nesting and hatching season)?
16. If the project is within the 1000-ft buffer around the loggerhead sea turtle current range, will the project include the addition of any permanent or temporary artificial lighting at night (sunset to sunrise) in the outdoor environment between May 1 and October 31 (sea turtle nesting and hatching season)?
17. Will the proposed project include solar energy development?
18. Is the action authorized, permitted, licensed, funded, or being carried out by a Federal agency in whole or in part?
19. Are you the lead Federal action agency or designated non-federal representative?
20. Does this analysis consider all effects of the action to listed species and their designated Critical Habitat? Note: This requires ensuring an accurate Action Area that includes all areas to be affected directly or indirectly by the action (i.e., project activities) and not merely the immediate area involved in the action. For example, for a project that will directly or indirectly impact aquatic habitat, the Action Area should include any areas upstream, downstream, riparian and upland to encompass all temporary and permanent changes to “land, water, and air” caused by activities that would not occur but for the proposed action and are reasonably certain to occur. Please see Standing Analysis Section 4 for more guidance.

21. Below is a list of documents, laws, and regulations that could potentially apply to this project. Have you reviewed the documents, laws, and regulations relevant to your project?
    - U.S. Endangered Species Act (https://www.fws.gov/law/endangered-species-act)
    - U.S. Fish and Wildlife Coordination Act (https://www.fws.gov/law/fish-and-wildlife-coordination-act)
    - Georgia's Erosion and Sedimentation Control Act (https://gaswcc.georgia.gov/urban-erosion-sediment-control/technical-guidance)
    - Georgia Stormwater Management Manual (https://atlantaregional.org/what-we-do/natural-resources/georgia-stormwater-management-manual/)
    - Georgia's Environmental Protection Division NPDES Stormwater Permits (https://epd.georgia.gov/watershed-protection-branch/stormwater)
    - Metropolitan North Georgia Water Planning District Model Stream Buffer Protection Ordinance (https://northgeorgiawater.org/wp-content/uploads/2018/08/Stream-Buffer-Protection.pdf)
    - Permit Special Conditions for Manatee (https://www.fws.gov/story/manatee-conservation-georgia)
    - U.S. Clean Water Act (https://www.fws.gov/policy-library/561fw3)
22. Does this analysis include all impacts to listed species and their critical habitats that may result from the entirety of the ESA defined action area, not just activities in the jurisdictional area (e.g., for USACE, this would include activities in the entire ESA defined action area - both jurisdictional waters and upland habitat on the site, as well as upstream and downstream impacts associated with project activities)?

11 APPENDIX B: MANATEE SPECIAL PERMIT CONDITIONS FOR U.S. ARMY CORPS OF ENGINEERS PROJECTS

The Special Permit Conditions for the West Indian Manatee apply to the construction, modification, maintenance and use of single and multi-family private recreational docks (conditions A through J) and private community docks and commercial marinas (conditions A through P). Although the Special Permit Conditions were written primarily with dock and marina projects in mind, they can be appropriate for other types of projects that are permitted by the U.S. Army Corps of Engineers Savannah District.

A. The permittee shall ensure that all personnel associated with construction of the authorized dock facility are informed of the civil and criminal penalties for harming, harassing or killing manatees, which are protected under the Endangered Species Act of 1973 (ESA) and the Marine Mammal Protection Act of 1972. The permittee and the permittee's contractor(s) will be held responsible for any manatee harmed, harassed or killed because of construction activities.

B. The use of siltation barriers in waters of the United States, below the high tide line, is not allowed in association with the construction of the authorized dock facility.

C. All vessels associated with project construction shall operate at "no wake/idle" speeds at all times while in the project area. All vessels will follow routes of deep water when entering or exiting the project area, and while operating in the project area, whenever possible. For the purposes of compliance with manatee conditions, the project area is defined as all areas of shoreline, marsh and open waters within 100 feet of the outermost perimeter of the authorized dock facility.

D. All contractors and other on-site personnel are responsible for observing for the presence of manatees in or near the project area. All in-water construction activities shall cease upon sighting of a manatee within 50 feet of any ongoing work in the marsh or open waters. Activities will not resume until the manatee(s) has moved beyond the 50-ft radius of the project operation, or until 30 minutes elapses if the manatee(s) has not reappeared within 50 feet of the operation. Animals must not be herded away or harassed into leaving.

E. Extreme care shall be taken when lowering equipment and materials below the water surface and/or to the water bottom. Equipment and materials include but are not limited to: piles; sheet piles; casings for drilled shaft construction; spuds; pile templates; and anchors. All such equipment/material shall be lowered as slow as possible, to avoid injury to any manatee that may have entered the project area undetected.

F. In the event of injury to or mortality of a manatee in the project area, the permittee or contractor shall immediately notify the Georgia Department of Natural Resources (Georgia DNR) at 912-264 -7218, or 1-800-272-8363 (weekdays between 8:00 a.m. to 4:30 p.m.), or 1-800-241-4113 (nights and weekends). Within one hour of a manatee injury or mortality the permittee or contractor shall notify the U.S. Army Corps of Engineers (Corps) at 1-800-448-2402 and the U.S. Fish and Wildlife Service (FWS) Georgia Ecological Services Field Office at GAES_Assistance@FWS.gov. Any dead manatee found in the project area shall be secured to a stable object to prevent the carcass from moving with the current. In the event of a manatee injury or mortality, all open water construction activity shall cease pending completion of consultation between the Corps and FWS, pursuant to Section 7 of the ESA.

G. The permittee shall ensure that the contractor keeps a lot of sightings, collisions or injury to manatees that occur during construction of the dock facility.

H. Within 30 days of project completion, the permittee shall submit a report summarizing manatee sightings or incidents that occurred during project construction, to the U.S. Fish and Wildlife Service

at GAES_Assistance@FWS.gov or 4980 Wildlife Drive NE, Townsend, Georgia 31331. Submission of a negative report is not required.

I. All temporary or unused construction materials shall be removed from the project area upon completion of the work, and any impacted area of salt marsh shall be restored. No construction debris or trash is to be discarded in project area.

J. The permittee shall regularly inspect and maintain all hoses, faucets, and other potential sources of freshwater, to ensure that any freshwater leak is stopped and immediately repaired. Manatees are attracted to freshwater leaking from dock facilities, where boats are concentrated and there is an increased risk for manatee collisions.

K. Prior to initiating authorized construction activities, the permittee shall contact Georgia DNR at 912-264-7218 for assistance with development of temporary manatee awareness sign plan for the project area. The plan will include the types and number of signs; and locations where signs will be installed to be prominently visible to contractors entering the project area from uplands and from the water. The permittee shall install temporary manatee awareness signs in accordance with the Georgia DNR approved plan. See attached Appendix A for information about the size and appearance of temporary manatee awareness signs. Within 30 days of project completion, the permittee shall remove all temporary manatee signs.

L. Once construction activities are completed, and prior to use of the facility, the permittee shall contact Georgia DNR at 912-264-7218 for assistance with development of permanent manatee awareness sign plan. The plan will include the types and number of signs; and locations where signs will be installed to be prominently visible to all facility users entering the project area from uplands and from the water. The permittee shall install permanent manatee awareness signs in accordance with the Georgia DNR approved plan. See attached Appendix A for information about the size and appearance of permanent manatee awareness signs.

M. Within 30 days of installation, the permittee shall submit a notarized letter to the Corps confirming that required permanent manatee signs have been installed in compliance with the Georgia DNR approved plan. The permittee shall maintain all permanent manatee signs in a clearly visible condition for the life of the facility.

N. The permittee shall utilize the Georgia DNR video "Georgia Wildlife - Sharing the Coast - Manatee" as a manatee education awareness program. This video program focuses on educating boaters on manatee biology, how watercraft can adversely affect the manatee, and detail actions that boaters can take to avoid impacts to the manatee. The permittee shall ensure that all boat operators view this video before using the permitted facility. The permittee shall continue a manatee education awareness program for the life of the facility. The permittee may develop and use a comparable manatee education awareness program upon approval by the Corps, FWS, and Georgia DNR.

O. After project completion, the permittee shall identify the individual, facility operator or homeowner's association representative to be responsible for reporting manatee sightings, boat strikes or other manatee concerns to the FWS and Georgia DNR.

P. For facilities with oil/gas pumps and/or sewage pump-out equipment, the permittee shall develop and maintain spill contingency plans in accordance with the requirements of the Georgia DNR, Coastal Resources Division.

11.1 Rationale for Manatee Special Permit Conditions

A. Informing personnel associated with construction of civil and criminal penalties for taking manatees will enhance vigilance for manatees while operating vessels and construction equipment with the potential to strike manatees and reduce risk of take to insignificant levels and making it discountable.
B. Prohibiting construction associated siltation barriers below the high tide line will eliminate the risk of manatees present near the siltation barrier becoming entangled, thereby reducing the risk of injury/take to insignificant levels and making it discountable.
C. Reducing the speed of vessels to "no wake/idle" speeds will lengthen the time manatees have to avoid vessels and will provide vessel operators with more time to observe manatees and stop the vessel and/or adjust course, thereby reducing the risk of injury/take to insignificant levels and making it discountable.
D. Clarifying all on-site personnels' personal responsibility toward manatees and establishing the stop work procedures should a manatee enter the project area will reduce the risk of take to insignificant levels and make it discountable.
E. Lowering equipment and materials below the water surface and/or to the water bottom as slowly as possible will lengthen the time potential manatees in the project area have to notice the activity and safely move away before becoming injured, thereby reducing the risk of take to insignificant levels and making it discountable.
F. In the unlikely event of manatee injury or death while following these conditions, stopping work to prevent further injuries and reporting the incident to FWS and Georgia DNR will allow wildlife biologists and veterinarians to respond, at which time they may take measures to facilitate healing injuries, collect data about the injury to study the efficacy of conservation measures, or facilitate other scientific endeavors. This condition is wholly beneficial to manatees as it allows for immediate professional care of injured manatees and will reduce the rate of incidents in the future with improved study of construction conservation measures for manatees and manatee behavior.
G. A log of manatee sightings, collisions, or injury to manatees that occur during construction activities will be wholly beneficial for manatees as it will reduce the rate of incidents in the future with improved study of manatee behavior and conservation measures for manatees.
H. Submitting a report summarizing manatee sightings and incidents that occurred during project construction within 30 days of project completion will be wholly beneficial for manatees as it will reduce the rate of incidents in the future with improved study of construction conservation measures for manatees and manatee behavior.
I. Removal of all temporary or unused construction materials/debris/trash from the project area upon completion of the work, and any impacted area of salt marsh shall be restored will prevent habitat degradation. In conjunction with the other special permit conditions, the short-term risk of manatee take while implementing these activities is reduced to insignificant levels and the long-term effect is wholly beneficial.
J. Leaky sources of freshwater input attract manatees where boats are concentrated, thereby increasing the risk for manatee collisions. Eliminating freshwater inputs eliminates a trigger for manatee congregations near marina and dock facilities where manatees are at greater risk of injury/take from collision with vessels. Implementing this condition removes manatee injury/death risk factor and has wholly beneficial effects.
K. The permittee working in conjunction with Georgia Department of Natural Resources to develop a temporary manatee awareness sign plan for the project area will create reminders to this specific project phase thereby reducing a manatee injury/death risk factor by changing human behavior while operating vessels to avoid vessel strikes and associated injury/take to manatees and has wholly beneficial effects.
L. The permittee working in conjunction with Georgia Department of Natural Resources to develop a permanent manatee awareness sign plan for the project area will provide detailed information about

manatees, how to avoid negative impacts to manatees, and to raise awareness of their presence in Georgia to any person using the facility. This condition reduces the risk of manatee-vessel collisions. Implementing this condition reduces a manatee injury/death risk factor by changing human behavior while operating vessels to avoid vessel strikes and associated injury/take to manatees and has wholly beneficial effects.

M. The permittee confirming compliance with the permanent manatee awareness sign plan and maintaining all permanent manatee signs in a clearly visible condition for the life of the facility reduces a manatee injury/death risk factor by changing human behavior while operating vessels to avoid vessel strikes and associated injury/take to manatees and has wholly beneficial effects.
N. Showing the Georgia DNR video ""Georgia Wildlife - Sharing the Coast - Manatee"" (or a comparable manatee education awareness program approved by the Corps, FWS, and Georgia DNR) to all boat operators as a manatee education awareness program and requirement prior to using the facility reduces a manatee injury/death risk factor by changing human behavior while operating vessels to avoid vessel strikes and associated injury/take to manatees and has wholly beneficial effects.
O. Identification of the individual, facility operator or homeowner's association representative to be responsible for reporting manatee sightings, boat strikes or other manatee concerns to the FWS and Georgia DNR will be wholly beneficial for manatees as it will reduce the rate of incidents in the future with improved study of manatee behavior and conservation measures for manatees.
P. Development and maintenance of spill contingency plans in accordance with the requirements of the Georgia DNR, Coastal Resources Division for facilities with oil/gas pumps and/or sewage pump-out equipment reduces exposure to contaminants harmful to manatees and their habitats thereby decreasing the risk factor associated with these facilities to a discountable level.

12 Appendix C: Rationale for Conservation Measures for Plants

Please see Conservation Measures for Plants (see Table 1 for species list) for a complete list of measures that are included in this DKey.

Maintaining a 200-ft buffer between equipment staging areas and equipment maintenance areas from or any area draining into occupied granite outcrop habitat either eliminates the exposure of granite outcrop species to associated stressors or reduces the impacts to insignificant and discountable levels.

Avoiding the use of pesticides and herbicides within 200 feet of occupied granite outcrop habitat eliminates the opportunity for direct impacts to listed plants. Pesticide drift of 200 feet is extremely unlikely to occur if pesticides are used according to labels and would transport very low concentrations of pesticide that may cause physiological distress; however, this scenario is discountable and would likely result in insignificant impacts if it were to occur.

Excavation spoil and stockpiled materials be placed at least 200 feet away from or any area draining into occupied granite outcrop habitat place spoil and stockpile material appropriately buffer occupied granite outcrop habitat that machinery used to place the material implement a substantial buffer that prevents direct crushing from occurring; the 200 foot buffer substantially reduces the likelihood of dust reaching protected plants rendering the scenario discountable and reduces the amount of dust coating granite outcrop plants to insignificant levels.

Use of orange barrier fence or other measures to avoid impact to granite outcrop habitats during construction activities limit potential scenarios to discountable levels.

Vegetation removal, mowing, and management of plants using mechanical devices within known populations of federally listed plants will be coordinated with the USFWS Georgia Ecological Services and Georgia Department of Natural Resources (Each Environmentally Sensitive Area shall have a management plan for all activities within the designated area.) to ensure plant management activities have insignificant and/or discountable effects on listed granite outcrop plant species.

Restoration, seeding, or replanting within suitable habitat for protected plants be coordinated with the USFWS Georgia Ecological Services Field Office and Georgia Department of Natural Resources and be in accordance with an approved management plan for the area or species. (These activities will use only native seed mixes or plantings that are compatible with the focal species or habitats within the project area.). Coordination will substantially limit the possibility of negatively impacting listed species due to incompatible plantings or implementation of harming plant management techniques rendering negative impacts discountable or insignificant. Additionally, use of natives and plantings that are compatible with the focal species or habitats will limit the potential harm due to competition to insignificant levels.

Conditions regarding ensuring materials, vehicles, machinery, and equipment are cleaned and free from invasive plant material limit the potential for introducing competition to the granite outcrop plant species to insignificant levels.

All vehicles, machinery, and equipment avoiding the use of granite outcrop or exposed rock habitat for storage, parking, turnarounds, or other purposes eliminates the potential for direct crushing of granite outcrop species from vehicles, machinery, and equipment so they will have no effect on granite outcrop plant species.