



## U.S. Fish & Wildlife Service

# The Florida Coastal Program

## Florida Ecological Services Field Office

### Gainesville, Florida

Florida has the longest coastline in the lower 48 states and is one of the most ecologically diverse states providing ample opportunities for conservation implementation by the Florida Coastal Program (CP). There are 134 federally listed species and 90 federally designated at-risk species including many endemic species in ecosystems as varied as freshwater rivers, streams, springs, wet prairies, and bogs; coastal beaches, dunes, and barrier islands; salt marsh, mangrove swamps, oyster reef, coral reef, tidal flats, and submerged aquatic vegetation including seagrasses; open pine forests, hardwood forest, scrub, and dry prairie; and aquatic and terrestrial caves. Conservation opportunities in Florida range from improving habitat on large, protected lands to working on private lands to increase habitat connectivity for wildlife across the landscape. The Florida CP works on discrete habitats such as freshwater seeps and springs, and larger watershed-wide efforts that include a variety of habitats. We focus on globally rare habitats such as the pine rocklands (literally in the backyard of many local Miami residents) to highly human-populated barrier beaches and dunes areas often occupied by wildlife known from only that location, and habitats in rapid decline such as seagrass which provides the foundation for healthy estuaries.

Florida's coastal and inland ecosystems and natural resources face many risks stemming from factors of climate change including increased frequency and intensity of storms, rising seas, and changing weather extremes that lead to floods and droughts. Florida is also one of the fastest growing states with the third largest population in the United States (U.S.) putting added pressure on our natural resources with increased development that reduces habitat, fragments the landscape, changes the hydrology of aquatic systems, and increases nutrients in our waters. The Florida CP is uniquely positioned to make connections with the State, local governments, and numerous conservation organizations. Forming and maintaining close partnerships with these



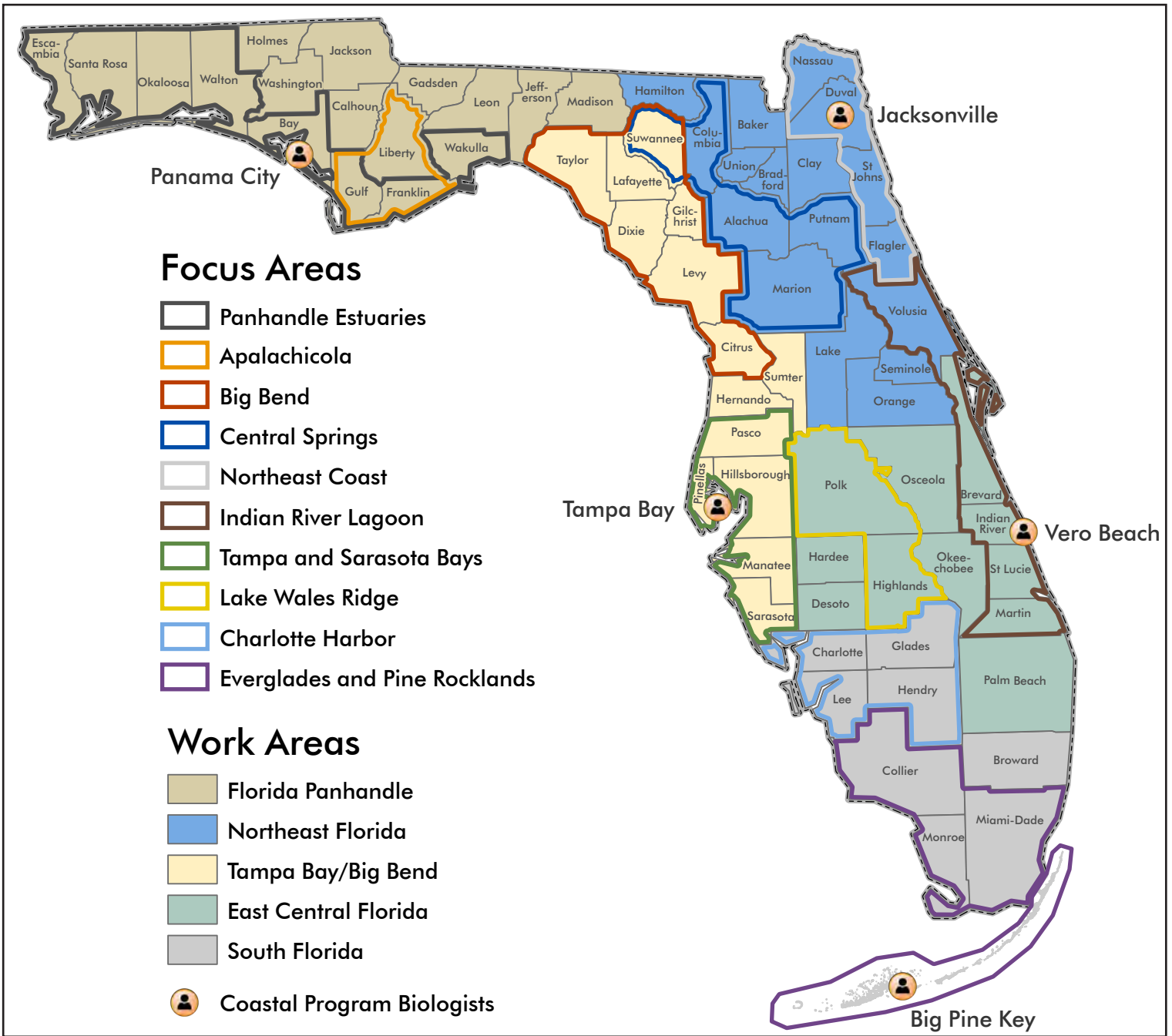
*A coastal dune lake at Topsail Hill Preserve State Park, credit USFWS/Melody Ray-Culp.*

organizations, which have historically taken a proactive approach to address current and future risks to species and habitats statewide, is key to successful conservation. Established initiatives among these partners include mitigation of climate change impacts, the protection of species, and creation of wildlife corridors to protect and improve landscape connectivity, all of which align perfectly with the National Priorities for the CP. Our participation in these partnerships influences these initiatives to collectively address common priorities that will ultimately increase ecosystem resiliency and minimize risks to species.

The Florida CP has five full-time biologists working in the Division of Conservation Delivery and positioned in coastal regions throughout the State at the following locations: Panama City (covering the Florida Panhandle), Jacksonville (covering Northeast Florida), St. Petersburg (covering Tampa Bay and Big Bend), Vero Beach (covering East-Central Florida), and Big Pine Key at the

National Key Deer Refuge (covering South Florida). A State Coordinator/Team Lead, located at the State Office in Gainesville, serves as the liaison between the CP and the Partners for Fish and Wildlife Program to maximize the overall conservation effectiveness of both programs.

CP field staff have expertise in coastal ecosystems and restoration science to facilitate collaboration and support the needs of conservation organizations and private landowners. Field staff also coordinate in the development and implementation of projects, provide technical assistance, and help with land protection efforts to maximize the breadth, capacity, and/or effectiveness of broader conservation initiatives across the landscape. The Florida CP will continue to participate in conservation planning, provide science and decision support, and develop funding strategies for large or complex projects to increase ecosystem health and resiliency to benefit federally listed and at-risk species.



## Florida Panhandle Work Area Panama City, Florida

One CP biologist serves the Florida Panhandle Work Area, which includes the Panhandle Estuaries Focus Area and the Apalachicola Focus Area. The entire work area is in the Atlantic Coastal Plain physiographic province. The western part of the work area is in the Gulf Coastal Plains and Ozarks Landscape Conservation Cooperative, and the eastern part is in the South Atlantic Landscape Conservation Cooperative.

Important coastal ecosystems in this work area include salt marsh, oyster reef, tidal

flat, submerged aquatic vegetation including seagrass, beaches and dunes, barrier islands, and pine flatwoods. Freshwater ecosystems include marshes, wet prairies, seepage slopes, bogs, forested wetlands, rivers and streams, and springs. Other ecosystems include hardwood forested uplands, longleaf pine, sandhill, scrub, and aquatic and terrestrial caves.

Although the Florida Panhandle is less developed than other parts of the state, census data from 2015 show population growth in Okaloosa, Santa Rosa, and Walton counties to be faster than statewide averages. Numerous threats to coastal

wetlands in the Panhandle include: human development, freshwater quality and quantity entering estuaries, altered hydrology, erosion from hardened shorelines and subsidence, climate change, sea-level rise, natural weather events, and invasive species.

In the Florida Panhandle the CP collaborates with partners to:

- 1) identify and address threats to species and habitat through active engagement with resource management and conservation agencies, other organizations, and stakeholder groups;

2) establish use of nature-based techniques including living shorelines as the default method for protecting and enhancing destabilized and eroding shorelines for the benefit of at-risk estuarine species and migratory birds;

3) restore seepage slope and wetland pitcher plant prairie habitat for benefit of endangered reticulated flatwoods salamander, rare plants, and pollinators;

4) develop production and outplanting protocols for a broad palette of herbaceous beach dune plants for benefit of beach mice and other coastal dune species;

5) conduct status assessments, surveys, propagation, and transplanting of listed and at-risk plant species; and

6) develop hurricane response and recovery strategies for beach mice, including protocols for large-scale dune habitat restoration.

### Panhandle Estuaries Focus Area

This focus area includes eight bay estuary systems (Perdido, Pensacola, Choctawhatchee, St. Andrew, St. Joseph, Apalachicola, Ochlockonee, Apalachee bays) located along more than 260 miles of Gulf of Mexico (Gulf) shoreline, and several rivers that flow into these estuaries (Apalachicola, Blackwater, Chipola, Choctawhatchee, Escambia, Ochlockonee, Perdido, St. Marks, Wakulla, and Yellow rivers). Some of the many conservation areas in this focus area are Apalachicola National Estuarine Research Reserve, Gulf Island National Seashore, St. Vincent and St. Marks National Wildlife Refuges (NWRs), eight Florida aquatic preserves, seven state forests, Apalachicola and Choctawhatchee National Forests, several state parks, and Eglin and Tyndall Air Force Bases. Most of the focus area is identified by the Southeast Conservation Adaptation Strategy as having High and Medium Conservation Value (Southeast Blueprint 2020).

The Panhandle Estuaries Focus Area also features 15 recognized coastal dune lakes within two miles of the Gulf along 26 miles of coastline in Walton County. These unique, globally imperiled waterbodies are found elsewhere only in Oregon and three other countries. The coastal dune lakes of Walton

County connect intermittently to the Gulf at beach outlets that open and close depending on tide, wind, and other local conditions. Because lake water levels fluctuate and salinity varies with amount of freshwater and saltwater input, shoreline development has negatively impacted their natural function.

Together with several partners, the CP launched the Panhandle Living Shoreline Initiative in 2007 to encourage use of softer, greener, nature-based techniques to protect and stabilize shorelines instead of hardening them. Living shorelines constructed with salt marsh, oyster shell, and other natural elements can help provide stability and coastal resiliency along low-to-medium energy areas of bays and estuaries, preserve intertidal habitat, provide migratory corridors and habitat connectivity, attenuate wave

energy, maintain natural sediment movement, improve water quality, and mitigate effects of subsidence and sea-level rise. Initiative partners are working with public and private property owners to incorporate nature-based solutions for shoreline stabilization along each of six priority bays in the Florida Panhandle. Additionally, formal living shorelines training courses are being taught for marine contractors, consultants, and other practitioners throughout Florida.

In 2017 the Panhandle Estuarine Restoration Team (PERT) was established, a regional network of partners who work together to attain healthy and thriving estuarine habitats for people and wildlife along the Gulf from Perdido Bay to Alligator Harbor. Through collaborative opportunities, PERT leverages expertise, funding, and other resources for



*Partners look across restored seepage slope habitat at Grayton Beach State Park, where titi removal and fire made pitcher plants pop from seed and rhizome bank, credit USFWS/Melody Ray-Culp.*

habitat restoration. As a founding member of PERT, the CP will continue to serve on the steering committee and work with members to achieve PERT goals on public and private lands.

Three new estuary programs (EPs) have been established in this focus area, largely funded by civil penalties resulting from the Deepwater Horizon oil spill in 2010 and modeled after the National Estuary Program. The Pensacola and Perdido Bays EP was the first to be funded and established (2018), followed by the Choctawhatchee Bay EP (2019), then the St. Andrew and St. Joseph Bays EP (2020). Each EP seeks input from a broad array of stakeholders and develops a Comprehensive Conservation Management Plan (CCMP). The CP has provided financial and technical assistance for habitat improvement projects in these three estuaries for more than 20 years. Field staff have been actively engaged in the development of each EP, and will continue participating in technical advisory, policy board, and stakeholder meetings, and in CCMP development and implementation. Long-term coordination with the EPs makes the CP well-positioned to help identify and implement habitat improvement strategies to benefit federally listed and at-risk species.

The CP will also continue to support the Florida Oyster Recovery and Science Working Group to recover and manage oyster habitats and fisheries. Collaborative efforts will nurture a community of resource professionals, develop and share science-based products, and work to eliminate barriers for recovery of oysters and oyster habitat, important contributors to healthy coastal ecosystems.

**Apalachicola Focus Area**

The Apalachicola River region is one of the most important hotspots of biological diversity in the U.S., occupied by many endemic and rare species. According to NatureServe, “The bluffs and ravines of the Upper Apalachicola River Basin support an extraordinary number of reptile and amphibian species.” The Apalachicola Biosphere Reserve was designated by the United Nations Educational, Scientific, and Cultural Organization (UNESCO) in 1983, adding it to an international conservation network designed to protect biodiversity.

**Panhandle Estuaries Focus Area**

**Habitat Type:** Bays, Estuaries, Salt Marsh, Oyster Reef, Coastal Dune Lake, Coastal Dune, Barrier Island, Seepage Slope, Wet Prairie

**Total Listed & At-Risk Species in Focus Area:** Endangered (19), Threatened (21), At-Risk (15)

<b>Focal Species:</b> ESA Status, Common Name ( <i>Scientific Name</i> )	<b>Taxa Group</b>
<b>Endangered:</b> Choctawhatchee Beach Mouse ( <i>Peromyscus polionotus allophrys</i> ) Perdido Key Beach Mouse ( <i>Peromyscus polionotus trissyllepsis</i> ) St. Andrew Beach Mouse ( <i>Peromyscus polionotus peninsularis</i> ) Kemp’s Ridley Sea Turtle ( <i>Lepidochelys kempi</i> ) Reticulated Flatwoods Salamander ( <i>Ambystoma bishopi</i> ) Florida Perforate Cladonia ( <i>Cladonia perforata</i> )	Mammal Mammal Mammal Reptile Amphibian Lichen
<b>Threatened:</b> Gulf Sturgeon ( <i>Acipenser oxyrinchus desotoi</i> ) Eastern Black Rail ( <i>Laterallus jamaicensis jamaicensis</i> )	Fish Bird
<b>At-Risk:</b> Saltmarsh Topminnow ( <i>Fundulus jenkinsi</i> ) Gulf Coast Solitary Bee ( <i>Hesperapis oraria</i> )	Fish Insect

**Focal Area Counties:** Bay, Escambia, Gulf, Franklin, Okaloosa, Santa Rosa, Wakulla, Walton

**Types of Habitat Improvement:** Living shoreline construction using salt marsh, oyster reef, and other natural elements. Oyster shell recycling, native plant seed collection, propagation, and outplanting for dune restoration. Canopy removal to benefit seepage slope and wetland pitcher plant prairie habitat, and invasive species control.



Protecting endangered Florida torreya trees with enclosures at Torreya State Park, credit USFWS/ Melody Ray-Culp.

The Florida torreya, a conifer and one of the rarest trees in the world, grows in this area and is endemic to the ravine slopes on the eastern bank of the Apalachicola River and in parts of Georgia. Most of the focus area is identified by the Southeast Conservation Adaptation Strategy as having High and Medium Conservation Value (Southeast Blueprint 2020), demonstrating its exceptional quality. The Apalachicola River is designated an Outstanding Florida Water (OFW). Apalachicola Bay is also an OFW, as well as an aquatic preserve, with much of it included in the Apalachicola National Estuarine Research Reserve. The entire watershed is a priority waterbody for the Northwest Florida Water Management District’s Surface Water Improvement and Management Plan.

In the Apalachicola Focus Area, the CP will continue collaborating with recovery biologists and regional partners to support the recovery of several listed plant species and flatwoods salamanders. Future work will identify and prioritize sites for plant conservation and habitat improvement on public and private lands. Germination, propagation, outplanting, and monitoring protocols for population augmentation and/or reintroduction will also be developed; rare plant source material will be safeguarded in herbariums and seed banks for conservation and plant recovery.

A unique opportunity for large-scale restoration that would also benefit frosted flatwood salamander opened when the state acquired a large property (17,000+ acres) in 2020 through the Florida Forever Program. This property, known as St. Teresa Bluffs, is located along nearly 17 miles of the Ochlockonee River and Apalachee Bay in Franklin and Wakulla counties. It represents the final, critical link needed to form a contiguous large-scale landscape corridor of protected habitat that now comprises Bald Point State Park, Ochlockonee River State Park, St. Marks NWR, and Tate’s Hell State Forest. The CP plans to collaborate with partners to restore St. Teresa Bluffs in support of the National CP goal to conserve habitat and support large-scale habitat connectivity.



Salt marsh and pine flatwoods landscape at St. Joseph Peninsula State Park, credit USFWS/Melody Ray-Culp.

Apalachicola Focus Area	
<b>Habitat Type:</b> Bluff and Ravine Slopes, Longleaf Pine Flatwoods, Wet Prairie	
<b>Total Listed &amp; At-Risk Species in Focus Area:</b> Endangered (14), Threatened (15), At-Risk (7)	
Focal Species: ESA Status, Common Name ( <i>Scientific Name</i> )	Taxa Group
<b>Endangered:</b> Reticulated Flatwoods Salamander ( <i>Ambystoma bishopi</i> ) Apalachicola Rosemary ( <i>Conradina glabra</i> ) Chapman Rhododendron ( <i>Rhododendron minus</i> var. <i>chapmanii</i> ) Harper’s Beauty ( <i>Harperocallis flava</i> ) Florida Torreya ( <i>Torreya taxifolia</i> )	Amphibian Flowering plant Flowering plant Flowering plant Conifer
<b>Threatened:</b> Frosted Flatwoods Salamander ( <i>Ambystoma cingulatum</i> ) Florida Skullcap ( <i>Scutellaria floridana</i> ) Telephus Spurge ( <i>Euphorbia telephioides</i> ) White Birds-in-a-nest ( <i>Macbridea alba</i> )	Amphibian Flowering plant Flowering plant Flowering plant
<b>At-Risk:</b> Blackbract Pipewort ( <i>Eriocaulon nigrobacteatum</i> ) Henry’s Spider-lily ( <i>Hymenocallis henryae</i> )	Flowering plant Flowering plant
<b>Focal Area Counties:</b> Franklin, Gulf, Liberty	
<b>Types of Habitat Improvement:</b> Commercial pine timber removal, longleaf pine and wiregrass planting, prescribed fire, titi removal in wet prairies, rare plant propagation, outplanting, and reintroduction, and invasive species control.	

## Northeast Florida Work Area Jacksonville, Florida

The CP in Northeast Florida has one biologist located in Jacksonville who serves the Northeast Florida Work Area, which consists of three focus areas: Northeast Coast, Central Springs, and the northern portion of the Indian River Lagoon. This work area features major water bodies such as the St. Johns River and its associated spring system, the upper watershed of the spring-rich Suwannee River, the Guana-Tolomoto-Matanzas river system, the Intracoastal Waterway, and the Mosquito Lagoon.



The threatened adult wood stork, credit USFWS/George Gentry.

Important ecosystems in this work area are coastal dunes, barrier and spoil islands, coastal marsh, scrub, longleaf pine, mesic flatwoods, freshwater marshes, and freshwater springs. A multitude of federally listed species occur in northeast Florida, including Anastasia Island beach mice, West Indian manatees, red-cockaded woodpeckers, Florida scrub-jays, and wood storks. Natural resource management issues in the region are habitat loss and reduced water quality and quantity due to urban and agricultural development.

The CP will support species conservation in the coming years by facilitating acquisition and restoration of properties along the Florida Wildlife Corridor. Wildlife corridors

are a national priority for the CP, and they are especially important in Florida due to accelerated development from an increasing population and agricultural interest in the Florida Aquifer. "Florida Forever" is the state's funding mechanism to preserve environmentally sensitive lands along the Florida Wildlife Corridor; it is also supported by numerous non-profits. Each focus area has many opportunities for the CP to work along and in wildlife corridors.

### Northeast Coast Focus Area

The Northeast Coast Focus Area is characterized by barrier islands, spoil islands, and coastal rivers. Coastal habitats include dunes, marsh, scrub, and maritime hammock, while the interior is characterized by sandhill and mesic flatwoods. The absence of prescribed fire, an abundance of invasive species, and widespread development are the major threats to these habitats.

In 2010 the Northeast Estuarine Restoration Team (NERT) was established to support habitat improvement along the coast of northeast Florida. This collaborative partnership ensures coordination on appropriate restoration techniques and identifies priority estuarine restoration projects from Brevard County north to Nassau

County. As a founding member of this organization, the CP will continue serving on the steering committee and engage other NERT members to develop new habitat improvement projects on public and private lands.

The CP will continue coordinating with numerous partners on several Florida Forever projects. In the western edge of this focus area are several Florida Forever projects targeting valuable wildlife corridors for the red-cockaded woodpecker and Eastern indigo snake.

Along the border between Nassau and Duval counties stretching into Clay County is the Northeast Florida Timberlands and Watershed Reserve Florida Forever Project, which connects to several significant Florida Forever Projects stretching west. These collaborative efforts will eventually result in the creation of a new wildlife corridor connecting conservation lands along the eastern coast of Florida to Osceola National Forest. To the south is another Florida Forever project called the Matanzas to Ocala Conservation Corridor which aims to connect conservation lands from the east coast to Ocala National Forest.

### Northeast Coast Focus Area

**Habitat Type:** Coastal Dunes, Islands, Coastal and Freshwater Marshes, Sandhills, Mesic Flatwoods

**Total Listed & At-Risk Species in Focus Area:** Endangered (5), Threatened (10), At-Risk (5)

**Focal Species:** ESA Status, Common Name (*Scientific Name*)

**Taxa Group**

**Endangered:**

Anastasia Island Beach Mouse (*Peromyscus polionotus phasma*)  
Red-cockaded Woodpecker (*Picoides borealis*), proposed downlisting

Mammal  
Bird

**Threatened:**

Piping Plover (*Charadrius melodus*)  
Loggerhead Sea Turtle (*Caretta caretta*)  
West Indian Manatee (*Trichechus manatus*)  
Eastern Indigo Snake (*Drymarchon couperi*)  
Wood Stork (*Mycteria americana*)  
Frosted Flatwoods Salamander (*Ambystoma cingulatum*)

Bird  
Reptile  
Mammal  
Reptile  
Bird  
Reptile

**At-Risk:**

Gopher Tortoise (*Gopherus polyphemus*)  
Gopher Frog (*Lithobates capito*)

Reptile  
Amphibian

**Focal Area Counties:** Nassau, Duval, St. Johns, Flagler

**Types of Habitat Improvement:** Dune creation or expansion, dune planting, prescribed fire, nesting island creation, vegetation removal, plantings, predation control and living shorelines creation.

### Key Partners in Florida

- Archbold Biological Station
- Atlanta Botanical Garden
- Bok Tower Gardens
- Choctawhatchee Basin Alliance
- The Conservancy of Southwest Florida
- The Conservation Fund
- Ducks Unlimited
- Ecosphere Restoration Institute
- Fairchild Tropical Botanic Gardens
- Florida Audubon
- Florida Counties and Water Management Districts
- Florida Department of Environmental Protection
- Florida Fish and Wildlife Conservation Commission (FWC)
- Florida Forest Service
- Florida Natural Areas Inventory
- Gulf Island and Canaveral National Seashores
- Indian River Land Trust
- Institute for Regional Conservation
- MacDill Air Force Base
- Miami University (Ohio)
- National Estuarine Research Reserves
- National Estuary Program
- National Fish and Wildlife Foundation
- National Oceanic and Atmospheric Administration
- National Park Service
- National Wildlife Refuge System
- The Nature Conservancy
- North Florida Land Trust
- Panhandle Estuarine Restoration Team
- Sanibel-Captiva Conservation Foundation
- St. Andrew Bay Resource Management Association
- State University System of Florida
- Tall Timbers Research Station
- Tampa Bay Watch
- U.S. Army Corp of Engineers

### Central Springs Focus Area

The Central Spring Focus Area supports the highest density of freshwater springs in the world. The Florida Aquifer fuels these springs which feed into larger rivers, mainly the Suwannee and the St. Johns rivers. The spring's constant temperature provides essential wintering habitat for federally threatened Florida manatees. Highly specialized cave crayfish, snails, and amphipods, some of which are federally listed or at-risk species, occupy the underground spring caves and spring runs. These springs are threatened by increased water withdrawals and increased nutrients due to expanding agricultural use and development of surrounding urban areas.

The uplands in this focus area are mainly sandhills, scrub, and mesic flatwoods, used by the federally threatened Eastern indigo snake and Florida scrub-jay. The CP will coordinate with natural resource agencies on

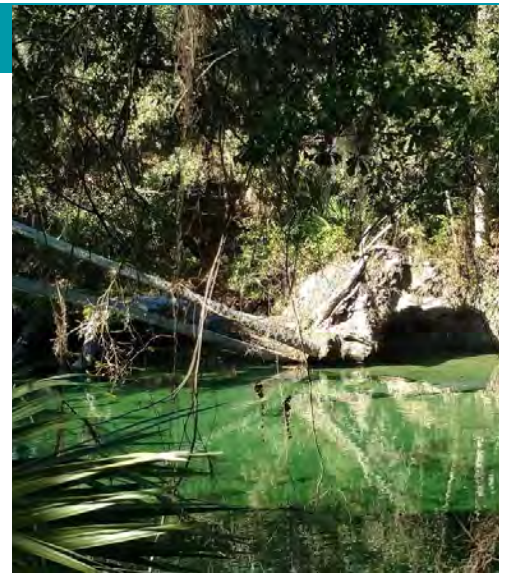
efforts to protect and improve these upland habitats to benefit groundwater recharge and create wildlife corridors. Sandhills are especially important aquifer recharge areas because the porous sands allow water to enter the aquifer rapidly with little runoff and minimal evaporation.

The CP is one of numerous partners involved in the development of the Ocala to Osceola (O2O) and Suwannee River Wildlife Corridor. The O2O is a 100-mile-long landscape of public and private lands connecting the Ocala and Osceola National Forests, as well as priority lands for the Florida Ecological Greenways Network. The Suwannee River provides water to North Florida communities and connects the O2O to the Gulf coast as part of the Florida Wildlife Corridor. The CP will work with partners to acquire and improve lands along the Suwannee River and these corridors to benefit many of the listed species residing in these areas.



*Jennifer Eels, biologist with FWC checking beach mice track tubes in a recently burned area of Cape Canaveral Air Force Station, credit FWC/Jennifer Eels.*

Central Spring Focus Area	
<b>Habitat Type:</b> Springs, Sandhill, Scrub, Mesic Flatwoods	
<b>Total Listed &amp; At-Risk Species in Focus Area:</b> Endangered (7), Threatened (12), At-Risk (19)	
Focal Species: ESA Status, Common Name ( <i>Scientific Name</i> )	Taxa Group
<b>Endangered:</b> Red-cockaded Woodpecker ( <i>Picoides borealis</i> ), proposed downlisting Etonia Rosemary ( <i>Conradina etonia</i> ) Longspurred Mint ( <i>Dicerandra cornutissima</i> )	Bird Plant Plant
<b>Threatened:</b> Florida Scrub Jay ( <i>Aphelocoma coerulescens</i> ) Eastern Indigo Snake ( <i>Drymarchon couperi</i> ) West Indian Manatee ( <i>Trichechus manatus</i> ) Sand Skink ( <i>Neoseps reynoldsi</i> ) Suwannee Alligator Snapping Turtle ( <i>Macrochelys suwanniensis</i> )	Bird Reptile Mammal Reptile Reptile
<b>At-Risk:</b> Pallid Cave Crayfish ( <i>Procambarus pallidus</i> ) Short-tailed Snake ( <i>Lampropeltis extenuata</i> )	Crustacean Reptile
<b>Focal Area Counties:</b> Putnam, Marion, Alachua, Columbia, Suwannee	
<b>Types of Habitat Improvement:</b> Dam removal, river channel naturalization, streambank erosion protection, longleaf and scrub thinning, native plantings, and prescribed fire.	



Erosion in Blue Spring needing bank stabilization for overwintering threatened manatees, credit FWC/Annie Roddenberry.

### Indian River Lagoon Focus Area

The Indian River Lagoon (IRL) Focus Area is covered by field staff in two different work areas. The Northeast Florida Work Area includes the IRL in Volusia County, while the East Central Florida Work Area includes those southern counties associated with the lagoon (see the description of the IRL under the East Central Work Area). Volusia County contains the northern most part of

the IRL and the northern half of the Mosquito Lagoon. Habitat improvement efforts in this County target coastal environments such as dunes, marsh, seagrasses, and scrub. Volusia is the northernmost range of Southeastern beach mouse, a focal species in this area. The CP will continue working with the state and the University of Florida to enhance habitat in this county to improve the species' resiliency within the IRL.

The Indian River Blueway and the Volusia Conservation Corridor are two Florida Forever wildlife corridor projects in Volusia County. The Indian River Blueway extends from the inland edge of the Indian River Lagoon in Volusia County to St. Lucie County which protects water quality by limiting development along the IRL. The Volusia Conservation Corridor connects the Tiger Bay State Forest to the marshes of the St. Johns River, benefitting federally threatened species such as the black rail and the wood stork. The CP in Northeast Florida will be working with resource agencies and private landowners to improve and protect habitat along these corridors to benefit both aquatic and inland listed and at-risk species.

Indian River Lagoon Focus Area	
<b>Habitat Type:</b> Coastal Dunes, Islands, Seagrasses, Marshes, Scrub	
<b>Total Listed &amp; At-Risk Species in Focus Area:</b> Endangered (6), Threatened (13), At-Risk (5)	
Focal Species: ESA Status, Common Name ( <i>Scientific Name</i> )	Taxa Group
<b>Endangered:</b> Southeastern Beach Mouse ( <i>Peromyscus polionotus phasma</i> ) Rugel's Pawpaw ( <i>Deeringothamnus rugelii</i> )	Mammal Plant
<b>Threatened:</b> Green Sea Turtle ( <i>Chelonia mydas</i> ) Eastern Black Rail ( <i>Laterallus jamaicensis jamaicensis</i> ) West Indian Manatee ( <i>Trichechus manatus</i> ) Wood Stork ( <i>Mycteria americana</i> )	Reptile Bird Mammal Bird
<b>At-Risk:</b> Gopher Tortoise ( <i>Gopherus polyphemus</i> )	Reptile
<b>Focal Area Counties:</b> Volusia	
<b>Types of Habitat Improvement:</b> Dune creation or expansion, dune plantings, nesting island creation, vegetation removal, native plantings, predation control and living shoreline creation.	



A threatened green sea turtle hatchling, credit Kate Fraser.



## Tampa Bay and Big Bend Work Area St. Petersburg, Florida

The Tampa Bay and Big Bend Work Area covers counties along the gulf coast of Florida from Sarasota County north to Taylor County and includes Suwanee, Lafayette, Gilchrist, and Sumter counties inland. This work area is primarily defined by its diversity of aquatic habitats consisting of spring systems, marshes, tidal creeks, islands, beaches, coastal forests, mangrove swamps and several large rivers, many of which transition into estuaries and eventually into the Gulf of Mexico. These abundant aquatic resources highlight the importance for recharging the Floridian Aquifer, enhancing water quality, and providing a mosaic of habitats that support many species. Extensive seagrass beds and saltmarshes in this work area provide a nursery area for finfish and shellfish, stopover and wintering areas for migratory waterfowl of the Atlantic and Mississippi flyway including forage areas for these same species, as well as marine mammals, resident avian species, and interjurisdictional fish and sea turtles.

This work area contains the relatively rural and silvicultural region of the Big Bend in the north, and rapidly transitions south into the highly developed urban areas within the Tampa Bay region. These disparate focus areas pose a unique set of challenges and opportunities for working with partners and private landowners on habitat improvement initiatives. Additionally, there are many significant issues within this work area that often cannot be controlled or managed including the occurrence of harmful algal blooms, industrial oil spills and boating impacts to seagrass and other aquatic substrate due to limited regional enforcement.

Partners throughout the work area have developed numerous plans identifying habitat types and associated threats as conservation priorities in need of protection and restoration. These plans offer many opportunities for integrating the CP's resources in support of diverse environments that contribute to habitat connectivity and a healthy landscape. Examples of priority

### Big Bend Focus Area

**Habitat Type:** Rivers, Streams, Hydric Hammock, Mesic Flatwoods, Tidal Marsh, Basin Swamp, Seagrass Beds, Bivalve Reefs, Barrier Islands

**Total Listed & At-Risk Species in Focus Area:** Endangered (5), Threatened (14), At-Risk (9)

Focal Species: ESA Status, Common Name ( <i>Scientific Name</i> )	Taxa Group
<b>Endangered:</b> Red-cockaded Woodpecker ( <i>Picooides borealis</i> ), proposed downlisting Florida Salt Marsh Vole ( <i>Microtus pennsylvanicus dukecampbelli</i> )	Bird Mammal
<b>Threatened:</b> Eastern Black Rail ( <i>Laterallus jamaicensis jamaicensis</i> ) Red Knot ( <i>Calidris Canutus rufa</i> ) Wood Stork ( <i>Mycteria americana</i> ) Suwannee Alligator Snapping Turtle ( <i>Macrochelys suwanniensis</i> ) Gulf Sturgeon Acipenser ( <i>oxyrinchus desotoi</i> ) Suwannee Moccasinshell ( <i>Medionidus walker</i> )	Bird Bird Bird Reptile Fish Clam
<b>At-Risk:</b> Southern Elktoe ( <i>Alasmidonta triangulata</i> )	Clam

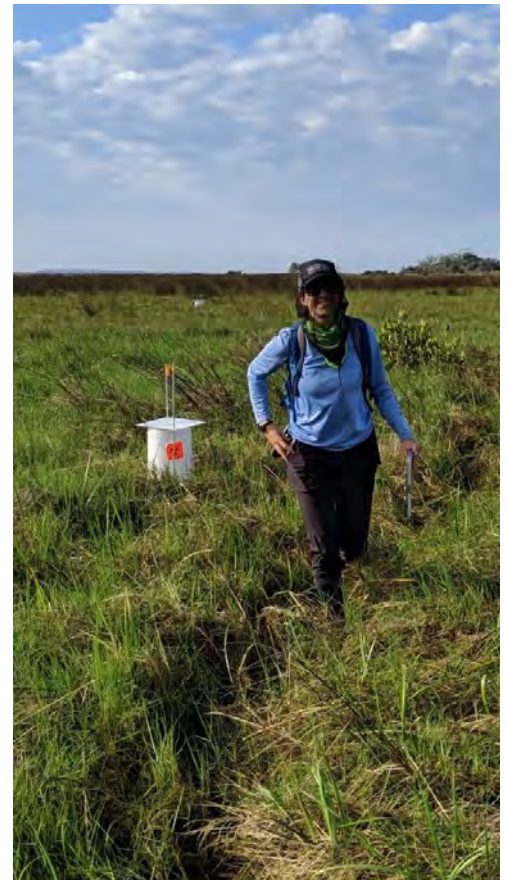
**Focal Area Counties:** Suwannee, Lafayette, Taylor, Gilchrist, Dixie, Levy, Citrus

**Types of Habitat Improvement:** Bivalve reef creation, seagrass recruitment, hydrologic barrier removal, buffer vegetation planting, prescribed fire, invasive species control and removal.

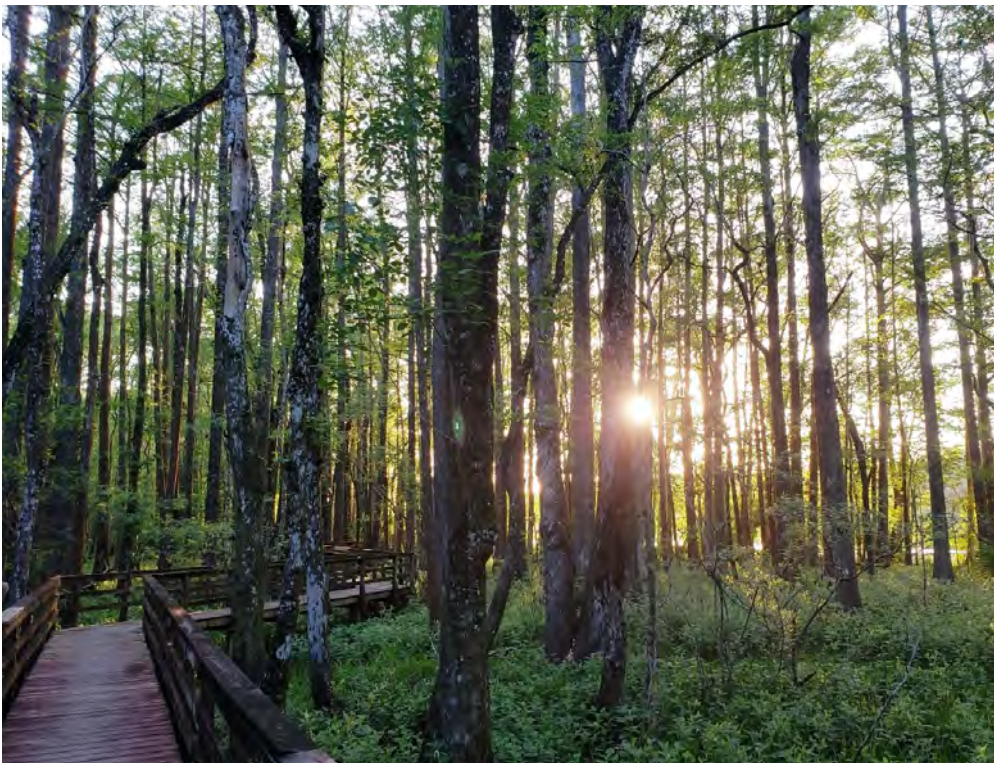
habitats include bivalve reefs that improve water quality and help local fisheries, as well as interior uplands that impact coastal systems and also support agriculture, forestry, and productive wildlife habitat. The Tampa Bay CP works with a large network of conservation organizations to address these issues, benefitting human and wildlife populations, with a particular emphasis on projects that improve coastal resiliency and reduce the impacts of sea-level rise.

### Big Bend Focus Area

The Big Bend focus area includes one of the largest remaining stretch of undeveloped coastlines in the continental U.S., comprising numerous conservation lands managed by federal, state and local agencies and private landowners. Sustaining forested watersheds and healthy ecosystem services are primary conservation aims for the Big Bend. This focus area has myriad aquatic habitats, consisting of several large rivers and spring systems transitioning into estuaries, with marshes, tidal creeks, barrier islands, coastal forests, bivalve reefs, and seagrass meadows. Further inland are extensive private working forests with abundant pine flatwoods and hardwood hammocks.



Sarah Sullivan, USFWS volunteer from the University of North Florida assisting with monitoring salt marshes for the endangered salt marsh vole, credit University of Florida/Marina McCampbell.



*Basin swamp along the Suwannee River in Lower Suwannee National Wildlife Refuge in Dixie and Levy Counties, credit USFWS/Tiffany Lane.*

The Big Bend region is especially important to Florida and the Gulf of Mexico in that it is largely an extensive, remote, expanse of habitats that provide high groundwater recharge. Threats in this region of Florida include: saltwater intrusion and flow reduction of its spring systems, water quality impacts from adjacent uplands and activities within the Gulf of Mexico, habitat destruction and fragmentation, shifts from low-impact silviculture to high density agriculture or grazing lands, increased sedimentation, reduced freshwater discharge, sea-level rise, aquifer water pollution, invasive species encroachment, major storm events and harmful algal blooms. However, due to the limited landscape alteration and relatively low human population in the Big Bend, there is a strong potential to protect existing habitat and resources, successfully restore altered habitat, and monitor future impacts.

Sustaining healthy ecosystem services is essential in this focus area as it is primarily a “resource-based economy” where livelihoods depend on activities such as silviculture, agriculture, recreational and commercial fishing, aquaculture, maritime industry, and ecotourism. However, in recent years there has been an increased concentration of conservation efforts in this region of Florida due to concerns regarding long-term impacts from the 2010 Deep Water Horizon Oil Spill.

This event, coupled with influences from other pollutants, climate change, sea level rise, development and habitat modification, water alteration, and conversion of working forests to agricultural lands makes this area a high priority. These changes are projected to have significant impacts on the overall health of the ecosystem and species which reside in or intermittently use this focus area.

The CP will continue collaborating with regional partners and the Lower Suwannee Refuge on the long-term initiative to repair the natural hydrology within the refuge. This project is removing barriers, primarily historic logging roads, to restore the historic flow regime into the Gulf of Mexico enhancing water quantity and quality in the overall system. Additionally, the CP will continue efforts to enhance coastal resiliency in Cedar Key and assist in numerous projects supporting bivalve reef creation to stabilize shorelines, improve water quality, and provide food

resources for a variety of birds and fish. The CP remains committed to supporting restoration efforts and land protection, maintaining species diversity, and ensuring the persistence of viable ecosystem services to preserve the cultural heritage of the area.

### **Tampa and Sarasota Bays Focus Area**

The Tampa and Sarasota Bays Focus Area concentrates on the transition zone between land and ocean, where freshwater from rivers meets and mixes with saltwater from the ocean. Large portions of the headwaters and estuaries in these watersheds are designated as a high priority by the Southeast Conservation Blueprint, which identifies important areas for conservation and restoration. This focus area encompasses Tampa and Sarasota Bay National Estuary Programs and Pinellas County, Cockroach Bay, Terra Ceia and Lemon Bay Aquatic Preserves. Both estuary programs have developed long-term management plans that set goals and prioritize the region’s natural resource protection, restoration, and management. This focus area is where the majority of the CP projects have historically implemented and where most of our partners have mutually directed their efforts. The Bays and Estuaries Focus Area is an essential and productive area for a multitude of our trust resources.



*Partners from Fort De Soto Park and the Rare Plant Conservation Program at Bok Tower Gardens reintroducing the endangered Florida Golden Aster to open, sandy soils along Florida scrub and sand hill communities in Pinellas County, FL, credit USFWS/Tiffany Lane.*

This region is one of the most rapidly growing areas in Florida, resulting in additional pressure on surrounding lands and waters. A recent and significant threat in this focus area is reduced freshwater discharge and increased human-source nutrients, intensifying the severity of harmful algae blooms. The Florida red tide organism (*K. brevis*) produce toxic chemicals which negatively affect both marine organisms and humans. Bivalve reefs are essential for filtering and removing these algae and innovative restoration techniques such as “living dock structures” covered with these filter-feeding animals can be deployed in high urban areas.

Additionally, Tampa Bay is heavily impacted by commercial and recreational use that contribute to shoreline erosion from boat wake and degradation of sea grass beds. The primary community organization focused on addressing these issues and opportunities is the Agency on Bay Management (AMB). The AMB established the Southwest Florida Water Management District’s Surface Water Improvement and Management (SWIM) Program, which manages projects that target the restoration of degraded habitats and stormwater quality improvement. The CP will continue working with the AMB and other partners on shoreline restoration and other habitat improvement efforts aimed at conserving bays, estuaries, shorelines, and associated watersheds for the benefit of fish, wildlife, and people.



Above and below: a shoreline stabilization project at Gadsen Point on MacDill Air Force Base in Tampa, Florida. Project progress from 2007 to May of 2013 showing significant oyster growth, credit Tampa Bay Watch/Peter Clark.



The endangered Brooksville Bellflower from a project site in the Tampa Bay Focus Area, credit USFWS.

### Tampa and Sarasota Bays Focus Area

**Habitat Type:** Shallow Open Water, Springs, Tidal Marsh, Mud and Sand flats, Mangrove Forest, Seagrass Beds, Bivalve Reefs, Barrier Islands

**Total Listed & At-Risk Species in Focus Area:** Endangered (40), Threatened (19), At-Risk (2)

**Focal Species:** ESA Status, Common Name (*Scientific Name*)

**Taxa Group**

**Endangered:**

- Loggerhead Sea Turtle (*Caretta caretta*)
- Florida Golden Aster (*Chrysopsis floridana*)
- Brooksville Bellflower (*Campanula robinsiae*)
- Pygmy Fringe-tree (*Chionanthus pygmaeus*)
- Beautiful Pawpaw (*Deeringothamnus pulchellus*)

- Reptile
- Plant
- Plant
- Plant
- Plant

**Threatened:**

- West Indian Manatee (*Trichechus manatus*)
- Red Knot (*Calidris Canutus rufa*)
- Smalltooth Sawfish (*Pristis pectinata*)
- Florida Bonamia (*Bonamia grandiflora*)

- Mammal
- Bird
- Fish
- Plant

**At-Risk:**

- Gopher Tortoise (*Gopherus polyphemus*)

- Reptile

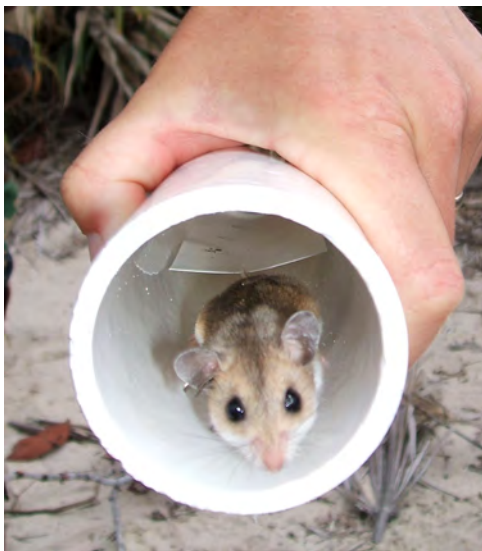
**Focal Area Counties:** Pasco, Pinellas, Hillsborough, Manatee, Sarasota

**Types of Habitat Improvement:** hydrologic barrier removal, bivalve reef restoration, installation of wave attenuation structures, natural vegetation planting, prescribed fire, invasive species control and removal.

## East Central Florida Work Area Vero Beach, Florida

The East Central Florida Work Area consists of the southern portion of the Indian River Lagoon (IRL) and Lake Wales Ridge focus areas, and includes many critical watersheds such as the nationally significant Northern Everglades and IRL, along with the headwaters of the St. Johns and the Kissimmee Rivers. This work area also contains seven national wildlife refuges and significant state and county conservation areas. Important focus ecosystems include coastal dunes, mangrove swamps, barrier and spoil islands, coastal marsh, seagrass meadows, scrub, and mesic flatwoods. Many federally listed and at-risk species inhabit and rely on these ecosystems for survival, including the southeastern beach mouse, West Indian manatee, Florida scrub-jay, Miami blue butterfly, and the scrub blazing star. Major ecosystem stressors include nutrient runoff and reduced water quality, altered hydrology, climate change related impacts, invasive plants, and loss of habitat connectivity.

With increasing urban development, protecting and enhancing wildlife corridors is vital to wildlife conservation. The CP will facilitate the prioritization and acquisition of properties located between conservation areas to enhance wildlife movement across the landscape. By supporting habitat improvement projects such as invasive



*A beach mouse in a tracking tube during a survey completed at Pelican Island National Wildlife Refuge, credit IHA.*

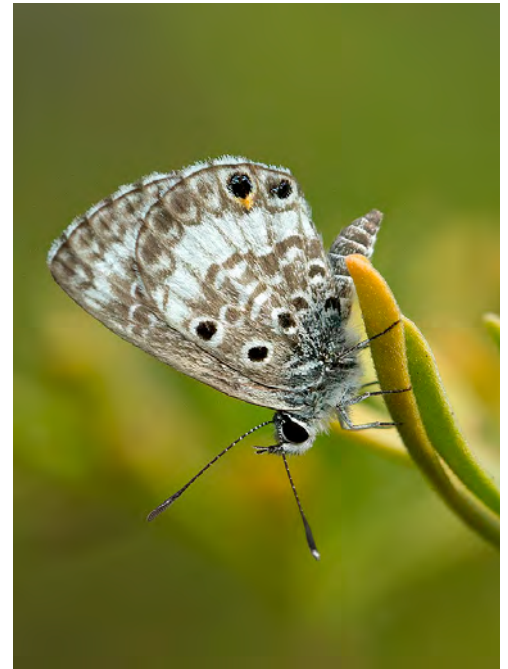
plant treatments and prescribed fire within these corridors and connected ecosystems, the CP supports and contributes to other conservation efforts, including those of the national wildlife refuges within this work area, providing greater impact across the landscape.

Advancing ecosystem health and resilience to climate change related impacts is a focus of the East Central Florida Work Area and one of the national priorities for the CP. Collaborating with diverse partners, this work area aims to facilitate habitat resilience and stabilization projects to protect and enhance coastal ecosystems threatened by impacts from sea level rise. There are currently many partnerships and initiatives within this work area for which the CP participates including the Northeast and East Central Estuarine Restoration Teams (NERT and ECERT), the Florida Scrub Ecosystem Working Group, the Florida Forever Program, and the Florida Wildlife Corridor Coalition. Having the latitude to work with multiple stakeholders in numerous ecosystems provides the ability to influence and implement species and habitat conservation where it is needed most.

### Indian River Lagoon Focus Area

The IRL Focus Area is covered by both the East Central Florida and the Northeast Florida CP Coordinators spanning from Martin County north to Volusia County. This focus area has two main ecological features – the IRL and the Atlantic Coastal Ridge. The CP provides technical and financial assistance within the IRL to improve water quality, restore lagoon habitats and enhance resilience to climate change. On the Atlantic Coastal Ridge, the CP collaborates with partners to restore or mimic natural processes that are vital to the health of the ecosystem.

The IRL is a 156-mile long “Estuary of National Significance,” one of 28 in the nation, and is considered as one of the most biologically diverse estuaries in North America. It holds numerous habitats, but has been mainly characterized by its seagrass meadows, mangrove forests, and saltmarshes which are essential to its overall health. The IRL joined the National Estuary Program in 1991 and is home to one third of Florida’s manatee population, provides



*The endangered Miami blue butterfly on bay cedar at a restoration site, credit Daniel Clark.*

important foraging habitat for juvenile sea turtles, and serves as a spawning and nursery ground for many vital fisheries.

There is increasing concern for the health and condition of the IRL due to decades of habitat degradation resulting from manmade hydrologic changes, non-point source pollution, loss and fragmentation of habitats, overuse/overharvest of resources, and the presence of invasive species. This has resulted in extremely poor water quality within the IRL and significantly reduced habitat for fish and wildlife. This altered ecosystem has impacted numerous wildlife species that are dependent on the lagoon for a portion, if not the entirety of their life cycle. A manatee mass mortality event in Florida during the winter of 2020-2021 resulted in the death of more than 900 manatees with more than half in the IRL; the loss of seagrass due to pollution and other environmental changes has been suggested as the primary culprit. The CP, along with numerous partners, are combining resources and efforts to identify ways to improve water quality, seagrass extent, and the overall health of the IRL.

The IRL Focus Area encompasses a large portion of the Atlantic Coastal Ridge, an ancient sand dune paralleling the coast from St. John’s County south to



The threatened Lakela's mint at the Nathaniel P. Reed Hobe Sound NWR, credit Jess Richards.

Palm Beach County. The Atlantic Coastal Ridge is composed of scrub and scrubby flatwood habitats that have been severely disjointed and negatively transformed by urban development. Much like the Lake Wales Ridge located in the center of the state, the Atlantic Coastal Ridge is home to many endemic and federally listed species including the Florida scrub-jay and Lakela's mint. Historically the landscape was maintained by lightning-strike fires, which are now largely suppressed allowing trees, dense woody vegetation, and invasive plants to dominate the habitat.

Along with the two ecological features mentioned above, this focus area also includes coastal dunes, spoil islands and saltmarsh which are important to listed species such as the southeastern beach mouse, the wood stork, and the black rail. These coastal habitats are increasingly vulnerable to climate change stressors. Through coordination with other natural resource agencies and research partners, the CP will incorporate climate change considerations into project planning and implementation to support sustainable and resilient habitats and remain a major partner in facilitating habitat improvement in East Central Florida.

Long Cypress Scrub before and after sand pine removal restoration, credit USFWS/R. Aldredge.

**Indian River Lagoon Focus Area**

**Habitat Type:** Mangrove Forest, Saltmarsh, Seagrass Meadow, Coastal Dunes, Islands, Scrub

**Total Listed & At-Risk Species in Focus Area:** Endangered (19), Threatened (13), At-Risk (5)

<b>Focal Species:</b> ESA Status, Common Name ( <i>Scientific Name</i> )	<b>Taxa Group</b>
<b>Endangered:</b> Southeastern Beach Mouse ( <i>Peromyscus polionotus phasma</i> ) Rugel's Pawpaw ( <i>Deeringothamnus rugelii</i> ) Miami Blue Butterfly ( <i>Cyclargus thomasi bethunebakeri</i> )	Mammal Plant Insect
<b>Threatened:</b> Johnson's Seagrass ( <i>Halophila johnsonii</i> ) Green Sea Turtle ( <i>Chelonia mydas</i> ) Eastern Black Rail ( <i>Laterallus jamaicensis jamaicensis</i> ) West Indian Manatee ( <i>Trichechus manatus</i> ) Lakela's Mint ( <i>Dicerandra immaculata</i> ) Tiny Polygala ( <i>Polygala smallii</i> ) Florida Scrub-Jay ( <i>Aphelocoma coerulescens</i> )	Seagrass Reptile Bird Mammal Plant Plant Bird
<b>At-Risk:</b> Gopher Tortoise ( <i>Gopherus polyphemus</i> )	Reptile

**Focal Area Counties:** Volusia, Brevard, Indian River, St. Lucie, Martin

**Types of Habitat Improvement:** Dune creation or expansion, wetland restoration, nesting island creation, vegetation removal, native plantings, seagrass establishment, and living shoreline creation.

**Lake Wales Ridge Focus Area**

The Lake Wales Ridge is a unique geological feature formed from ancient beach and dune systems that have stood above sea level for over a million years, making it one of the oldest natural communities in Florida. It extends approximately 100 miles from Clermont in Lake County, south to Sebring, terminating in Venus, Highlands County. The Lake Wales Ridge is globally recognized for its scrub habitat and plant and insect biodiversity. The scrub habitat is characterized by woody shrubs, absence of a tree canopy, and bare white sandy patches. It has several endemic species such as the Florida ziziphus, sand skink, and the Highlands tiger beetle.

The main threats to much of the Lake Wales Ridge ecosystem include the expansion of residential development, the conversion of habitat to agriculture, and the exclusion of natural ecosystem processes, particularly fire. Historically this system was maintained by intense fires ignited by lightning which consumed all aboveground vegetation restarting plant growth, also known as a stand-replacing disturbance. Today the scrub habitat on the Lake Wales Ridge has been severely fragmented by development and agriculture altering the frequency and intensity of needed stand-replacing fires leading to vegetation overgrowth and the encroachment of large trees. Habitat improvement efforts in this focus area



have centered around returning fire to the landscape through prescribed burns, treating invasive vegetation, and mechanically treating (or restructuring) vegetation as a surrogate for fire.

The CP will collaborate with natural resource partners to support strategies connecting and managing highly fragmented conservation areas along the Lake Wales Ridge. Future initiatives will aim to expand federally endangered plant populations, support research of new habitat management practices, and improve implementation of prescribed fire to benefit the many species that depend on the unique characteristics of the scrub habitat found on the Lake Wales Ridge.



USFWS volunteer, Jeremy Carr, scoping a gopher tortoise burrow during a population survey, credit Sarika Khanwilkar.

## South Florida Work Area Big Pine Key, Florida

The South Florida Work Area contains the Everglades and Pine Rocklands Focus Area and the Charlotte Harbor Focus Area. This work area has the largest number of listed species in the State including many endemics. With a dense human population in some locations, along with vast natural areas, extensive habitat improvement and technical assistance opportunities are abundant.

### Lake Wales Ridge Focus Area

**Habitat Type:** Scrub, Sandhill

**Total Listed & At-Risk Species in Focus Area:** Endangered (13), Threatened (10), At-Risk (18)

<b>Focal Species:</b> ESA Status, Common Name ( <i>Scientific Name</i> )	<b>Taxa Group</b>
<b>Endangered:</b> Scrub Blazingstar ( <i>Liatris ohlingerae</i> ) Scrub Lupine ( <i>Lupinus aridorum</i> ) Florida Ziziphus ( <i>Ziziphus celata</i> ) Florida Perforate Cladonia ( <i>Cladonia perforate</i> )	Plant Plant Plant Plant
<b>Threatened:</b> Eastern Indigo Snake ( <i>Drymarchon corais couperi</i> ) Sand Skink ( <i>Neoseps reynoldsi</i> ) Bluetail Mole Skink ( <i>Eumeces egregious lividus</i> ) Florida Scrub-Jay ( <i>Aphelocoma coerulescens</i> )	Reptile Reptile Reptile Bird
<b>At Risk:</b> Gopher Tortoise ( <i>Gopherus polyphemus</i> ) Florida Scrub Lizard ( <i>Sceloporus woodi</i> ) Blue Calaminta Bee ( <i>Osmia calaminthae</i> )	Reptile Reptile Insect

**Focal Area Counties:** Polk, Highlands

**Types of Habitat Improvement:** Mechanical vegetation treatments, invasive species control, prescribed burning, and native plantings.

The Everglades, also known as the “River of Grass” is the most prominent ecosystem of the South Florida Work Area. It is only one component of a complex area at the extreme southern tip of Florida. The globally rare pine rockland ecosystem, along with the Everglades, start at the Miami rock ridge in Miami-Dade County, extend through the lower Florida Keys, and are bounded by Biscayne Bay, Florida Bay and the Gulf Coast barrier islands from east to west. The northern part of this work area along the Gulf Coast is the Charlotte Harbor Focus Area. This diverse focus area is comprised of the lower Caloosahatchee River watershed which links Lake Okeechobee with its western estuary, Charlotte Harbor.

The CP in South Florida will support species conservation in the coming years by assisting with habitat improvement, providing the technical assistance, and facilitating land acquisition and protection in pine rocklands habitat. As a key partner, CP field staff will collaborate on the implementation of the Pine Rockland Recovery Plan and Pine Rockland Business Plan which aims to restore existing pine rocklands, expand the footprint of the ecosystem, and reestablish populations of imperiled species in this

habitat to their former range. Efforts will also focus on improving conditions in Florida Bay by restoring historic freshwater flows into the system to improve water quality to the greater Florida Keys. Improving water quality in this area will support numerous aquatic species including the smalltooth sawfish, while also increasing the overall health of the system and coastal resilience through enhancing seagrass beds and protecting coral reefs. Improving pine rockland, beach berm, and marsh habitats will help mediate the effects of sea level rise in this highly vulnerable island chain and provide quality habitat to support species and maintain biodiversity in the Florida Keys. Acquisition and restoration of parcels west of the Everglades will benefit surface water flows, address altered hydrology in support of wading birds, and provide critical habitat for panthers and bats.

The CP will also work with partners to develop novel approaches integrating green and gray infrastructure allowing for natural beach dynamics on the extensive barrier island system in the lower Gulf Coast. This work will continue benefitting breeding, migrating, and nesting shorebirds including red knots, and further support coastal resiliency.

While much of the land in this work area is protected by federal, state, and local land holdings, there is still significant work to be done to minimize impacts to those areas from unprotected lands and continuously improve how the lands and waters are managed within protected areas. Threats such as rapid residential development and the newly emerging threat of harmful algal blooms will be a priority.

Coastal resources such as beaches and dunes are also suffering from rising seas and increasing frequency and intensity of coastal storms and hurricanes which can have cascading effects across multiple ecosystems and habitats. The CP will look for opportunities to coordinate with resource organizations to improve coastal resiliency and lessen the impacts from climate change.

This work area is supported by an engaged group of partners and stakeholders who understand the value of working together on the many significant issues facing the long-term viability and stability of the South Florida ecosystem. The CP plays a key role in coordinating across agencies and programs to support science and conservation delivery to improve habitat and overall ecosystem health.

### Everglades and Pine Rockland Focus Area

There are two distinct ecosystems that are prominent in different ways in this focus area. Pine rocklands are globally imperiled and highly fragmented, hosting more than 20 federally listed species that are wholly or partially dependent on them for survival. In contrast, the Everglades are expansive and relatively intact, yet the system is still vulnerable due to altered hydrology and sea level rise. While the aim and effort in the Everglades has been to implement the Comprehensive Everglades Restoration Plan (CERP), there are opportunities for the CP to influence and act particularly in areas of private landownership, and with species-specific needs.

For example, the newly listed black rail has recently been documented to inhabit the Everglades year-round by both resident and migratory birds. However, it is poorly understood what their specific habitat requirements are or what can be done to improve conditions for them. The CP also supports pine rockland habitat restoration on private lands that, although small, can provide huge benefit for endangered species recovery and provide solutions to connect corridors. Although both the Everglades and Pine Rockland ecosystems are fire



*The endangered Big Pine partridge pea, credit USFWS/Kevin Kalasz.*

adapted, fire suppression, particularly in pine rocklands, remains a major threat, as does the continued concern from invasive species.

The CP will assist in leading a pine rocklands partnership with natural resource agencies and practitioners to improve habitat, expand rocklands into altered areas that have suitable substrate, and reintroduce species where needed and appropriate. We will support Everglades restoration in areas that receive relatively less attention from the CERP, including tidal saltmarsh habitats (i.e., Ten Thousand Islands) and Florida Bay to address freshwater delivery needs. The CP will also concentrate on habitat improvement projects to reduce impacts from sea level rise by either minimizing beach loss or developing novel restoration approaches to increase beach habitat on barrier islands.



*Prescribed burn to restore pine rocklands at The National Key Deer Refuge on Big Pine Key, Florida, credit USFWS.*



*The threatened American crocodile nestling hatched from an enhanced nesting site at Crocodile Lake NWR, credit USFWS/Jeremy Dixon.*



Nest enhancement for the threatened American crocodile at Crocodile Lake National Wildlife Refuge, credit USFWS/Jeremy Dixon.

### Charlotte Harbor Focus Area

The Charlotte Harbor Focus Area is defined by the Caloosahatchee Watershed. This focus area has extensive opportunity and needs for habitat improvement further up the Caloosahatchee River, including Lake Okeechobee. Important estuarine habitat types that are supported by this transition from freshwater to tidal saltwater include mud and sand flats, mangrove forest, seagrass beds, bivalve reefs, and barrier islands.

A large portion of the headwaters and estuaries are designated as high priority by the Southeast Conservation Blueprint, which identifies important areas for conservation and restoration. These areas are further supported by the Coastal and Heartland National Estuarine Program's Comprehensive Conservation and Management Plan and Habitat Restoration Needs Plan. Both of these plans were developed with stakeholder involvement and public input and have broad support to help guide initiatives in this focus area. Using these tools and documents, the CP and our partners will use data to identify high priority sites and habitat improvement to benefit the entire watershed and support federally listed and at-risk species.

The Southwest Estuarine Restoration Team (SWERT) was established in 2018 to provide a forum for partners to communicate, share, and collaborate on research and restoration. Aimed at estuaries extending from Anna Maria Sound to the Ten Thousand Islands on the Southwest coast of Florida, the mission of SWERT is to: develop partnerships to facilitate and implement restoration; create a regional landscape-level habitat initiative; and support habitat improvement of coastal marsh, mangroves, oyster reefs and seagrass. This team, co-led by the CP Coordinator in South Florida and the FWC, maintains a steering committee which provides guidance to a host of regional conservation partners who participate in periodic meetings and workshops.

This area is one of the most rapidly growing regions in Florida, resulting in additional pressure on the lands and watersheds.

Everglades and Pine Rockland Focus Area	
<b>Habitat Type:</b> Sawgrass Wetlands, Pine Rocklands, Hardwood Hammock, Barrier Islands, Mangrove Forest, Seagrass Beds, Mud and Sand Flats, Coral Reef	
<b>Total Listed &amp; At-Risk Species in Focus Area:</b> Endangered (35), Threatened (19), At-Risk (9)	
<b>Focal Species:</b> ESA Status, Common Name ( <i>Scientific Name</i> )	
<b>Taxa Group</b>	
<b>Endangered:</b>	
Miami Blue Butterfly ( <i>Cyclargus thomasi bethunebakeri</i> )	Insect
Florida Panther ( <i>Puma concolor coryi</i> )	Mammal
Florida Bonneted Bat ( <i>Eumops floridanus</i> )	Mammal
Deltoid Spurge ( <i>Chamaesyce deltoidea ssp. deltoidea</i> )	Plant
Beach Jacquemontia ( <i>Jacquemontia reclinata</i> )	Plant
Big Pine Partridge Pea ( <i>Chamaecrista lineata keyensis</i> )	Plant
<b>Threatened:</b>	
American Crocodile ( <i>Crocodylus acutus</i> )	Reptile
Roseate Tern ( <i>Dougallii dougallii</i> )	Bird
Eastern Black Rail ( <i>Laterallus jamaicensis jamaicensis</i> )	Bird
<b>At Risk:</b>	
Palatka Skipper ( <i>Euphyes pilatka klotsi</i> )	Insect
Key Ringneck Snake ( <i>Diadophis punctatus acricus</i> )	Reptile
<b>Focal Area Counties:</b> Miami-Dade, Monroe, Collier	
<b>Types of Habitat Improvement:</b> Mechanical vegetation treatments, invasive species control, prescribed burning, and native plantings.	





A threatened Red Knot observed after a project survey in Charlotte Harbor Focus Area, credit USFWS/Kevin Kalasz.

The Charlotte Harbor Estuary is further impacted by water management activities from Lake Okeechobee, where inconsistent freshwater flows and associated runoff can stress downstream habitats. While management is largely determined by the Army Corps of Engineers, opportunities to mitigate the impacts of management are possible by habitat improvement in the watershed and reconnecting the river to the floodplain. Significant threats include habitat loss and degradation due to rapid residential development, altered freshwater discharge, major storm events, harmful algal blooms, and sea level rise.

The CP will continue to work with partners to maximize conservation delivery benefits by providing decision support, technical assistance, and project funding for habitat improvement towards conserving bays, estuaries, shorelines, and watersheds for the benefit of fish, wildlife, and people. In the upper parts of the watershed, we will assist with efforts to reconnect and restore altered hydrology, protect and improve adjacent private and public lands, and increase habitat connectivity. Along the coast we will aim to enhance seagrass abundance and support projects to minimize shoreline loss.



Graduate student Kathleen Carey holding a Sanibel Island Rice Rat during a field survey, credit University of Florida/Andrew Veselka.

## U.S. Fish & Wildlife Service

### Charlotte Harbor Focus Area

**Habitat Type:** Pinelands, Dry Prairies, Fresh and Tidal Marsh, Mud and Sand flats, Mangrove Forest, Seagrass Beds, Bivalve Reefs, Barrier Islands

**Total Listed & At-Risk Species in Focus Area:** Endangered (11), Threatened (11), At-Risk (4)

Focal Species: ESA Status, Common Name ( <i>Scientific Name</i> )	Taxa Group
<b>Endangered:</b>	
Florida Panther ( <i>Puma concolor coryi</i> )	Mammal
Florida Bonneted Bat ( <i>Eumops floridanus</i> )	Mammal
Everglade Snail Kite ( <i>Rostrhamus sociabilis plumbeus</i> )	Bird
Beautiful Pawpaw ( <i>Deeringothamnus pulchellus</i> )	Plant
Okeechobee Gourd ( <i>Cucurbita okeechobeensis ssp. okeechobeensis</i> )	Plant
Red-cockaded Woodpecker ( <i>Picoides borealis</i> ), proposed downlisting	Bird
<b>Threatened:</b>	
American Crocodile ( <i>Crocodylus acutus</i> )	Reptile
Red Knot ( <i>Calidris Canutus rufa</i> )	Bird
<b>At-Risk:</b>	
Sanibel Island Rice Rat ( <i>Oryzomys palustris sanibeli</i> )	Mammal

**Focal Area Counties:** Charlotte, Glades, Lee, Hendry

**Types of Habitat Improvement:** Water quantity, quality, and hydrology restoration in rivers and tidal saltmarsh by hydrologic barriers removal. Bivalve reef restoration and creation using natural and artificial reefs, and shoreline restoration and erosion protection. Prescribed fire and mechanical control, seagrass restoration.



Mangrove forest, a priority habitat for coastal resiliency and water quality protection, credit FWC/Corey Anderson.