

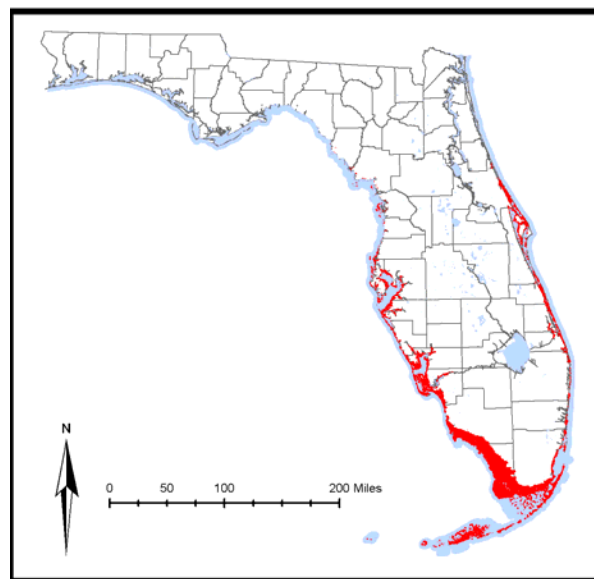
# Mangrove Swamp



## Status

Current condition: Poor and declining.

According to the best available GIS information at this time (see Appendix D. GIS Data Tables), 588,434 acres (238,131 ha) of Mangrove Swamp habitat exist, of which 88% (515,783 ac; 208,730 ha) are in existing conservation or managed areas. Another 2% (10,376 ac; 4,199 ha) are in Florida Forever projects and 3% (16,997 ac; 6,878 ha) are in SHCA-designated lands. The remaining 7% (45,278 ac; 18,323 ha) are other private lands.



Some habitat distributions or locations may be misrepresented on this map due to size, resolution and insufficient data sources.

## Habitat Description

**FNAI type:** Tidal Swamp

Mangroves form dense, brackish-water swamps along low-energy shorelines and in protected, tidally influenced bays of southern Florida. This community type is composed of freeze-sensitive tree species and, with some limited exceptions, mangroves which are distributed south of Cedar Key on the Gulf coast and south of St. Augustine on the Atlantic coast. These swamp communities are usually composed of red mangrove, black mangrove, and white mangrove. Depending on slopes and amounts of disturbance, mangrove swamps may progress in zones of single species from seaward (red mangrove) to landward (white mangrove) areas. Buttonwoods usually occur in areas above high tide. Often vines, such as rubber vines and morning-glory, clamber over mangroves, especially at swamp edges.

## Associated Species of Greatest Conservation Need

### Mammals

- |                                          |                               |
|------------------------------------------|-------------------------------|
| • <i>Eumops floridanus</i>               | Florida Bonneted Bat          |
| • <i>Sylvilagus palustris hefneri</i>    | Lower Keys Marsh Rabbit       |
| • <i>Oryzomys palustris planirostris</i> | Pine Island Marsh Rice Rat    |
| • <i>Oryzomys palustris sanibeli</i>     | Sanibel Island Marsh Rice Rat |
| • <i>Oryzomys argentatus</i>             | Silver Rice Rat               |
| • <i>Ursus americanus floridanus</i>     | Florida Black Bear            |
| • <i>Procyon lotor auspicatus</i>        | Key Vaca Raccoon              |
| • <i>Procyon lotor incautus</i>          | Key West Raccoon              |
| • <i>Lutra canadensis lataxina</i>       | River Otter                   |
| • <i>Mustela vison evergladensis</i>     | Everglades Mink               |
| • <i>Mustela vison halilimnetes</i>      | Gulf Salt Marsh Mink          |
| • <i>Mustela vison lutensis</i>          | Atlantic Salt Marsh Mink      |
| • <i>Odocoileus virginianus clavium</i>  | Key Deer                      |
| • <i>Trichechus manatus latirostris</i>  | Florida Manatee               |
| • <i>Tursiops truncatus</i>              | Atlantic Bottlenose Dolphin   |

### Birds

- |                                        |                            |
|----------------------------------------|----------------------------|
| • <i>Anas fulvigula fulvigula</i>      | Florida Mottled Duck       |
| • <i>Pelecanus occidentalis</i>        | Brown Pelican              |
| • <i>Fregata magnificens</i>           | Magnificent Frigatebird    |
| • <i>Ardea herodias occidentalis</i>   | Great White Heron          |
| • <i>Ixobrychus exilis</i>             | Least Bittern              |
| • <i>Egretta thula</i>                 | Snowy Egret                |
| • <i>Egretta caerulea</i>              | Little Blue Heron          |
| • <i>Egretta tricolor</i>              | Tricolored Heron           |
| • <i>Egretta rufescens</i>             | Reddish Egret              |
| • <i>Nycticorax nycticorax</i>         | Black-crowned Night-Heron  |
| • <i>Nyctanassa violacea</i>           | Yellow-crowned Night-Heron |
| • <i>Ajaja ajaja</i>                   | Roseate Spoonbill          |
| • <i>Eudocimus albus</i>               | White Ibis                 |
| • <i>Plegadis falcinellus</i>          | Glossy Ibis                |
| • <i>Mycteria americana</i>            | Wood Stork                 |
| • <i>Elanoides forficatus</i>          | Swallow-tailed Kite        |
| • <i>Haliaeetus leucocephalus</i>      | Bald Eagle                 |
| • <i>Falco peregrinus</i>              | Peregrine Falcon           |
| • <i>Rallus longirostris insularum</i> | Mangrove Clapper Rail      |
| • <i>Rallus longirostris scottii</i>   | Florida Clapper Rail       |
| • <i>Haematopus palliatus</i>          | American Oystercatcher     |
| • <i>Recurvirostra americana</i>       | American Avocet            |
| • <i>Sterna caspia</i>                 | Caspian Tern               |
| • <i>Anous stolidus</i>                | Brown Noddy                |
| • <i>Columba leucocephala</i>          | White-crowned Pigeon       |
| • <i>Coccyzus minor</i>                | Mangrove Cuckoo            |
| • <i>Tyrannus dominicensis</i>         | Gray Kingbird              |
| • <i>Vireo altiloquus</i>              | Black-whiskered Vireo      |
| • <i>Dendroica petechia gundlachi</i>  | Cuban Yellow Warbler       |
| • <i>Dendroica discolor paludicola</i> | Florida Prairie Warbler    |

## Reptiles

- *Crocodylus acutus* American Crocodile
- *Terrapene carolina bauri* Florida Box Turtle
- *Malaclemys terrapin* Diamondback Terrapin
- *Caretta caretta* Loggerhead
- *Lepidochelys kempii* Kemp's Ridley
- *Nerodia clarkii compressicauda* Mangrove Salt Marsh Snake
- *Crotalus adamanteus* Eastern Diamondback Rattlesnake

## Fish

- *Ginglymostoma cirratum* Nurse Shark
- *Carcharhinus brevipinna* Spinner Shark
- *Carcharhinus falciformis* Silky Shark
- *Carcharhinus isodon* Finetooth Shark
- *Carcharhinus plumbeus* Sandbar Shark
- *Negaprion brevirostris* Lemon Shark
- *Pristis pectinata* Smalltooth Sawfish
- *Manta birostris* Giant Manta
- *Megalops atlanticus* Tarpon
- *Gymnothorax moringa* Spotted Moray
- *Mugil cephalus* Striped Mullet
- *Menidia conchorum* Key Silverside
- *Rivulus marmoratus* Mangrove Rivulus
- *Gambusia rhizophorae* Mangrove Gambusia
- *Hippocampus erectus* Lined Seahorse
- *Centropomus parallelus* Smallscale Fat Snook
- *Centropomus pectinatus* Tarpon Snook
- *Centropomus undecimalis* Common Snook
- *Dermatolepis inermis* Marbled Grouper
- *Epinephelus adscensionis* Rock Hind
- *Epinephelus guttatus* Red Hind
- *Epinephelus niveatus* Snowy Grouper
- *Epinephelus striatus* Nassau Grouper
- *Mycteroperca bonaci* Black Grouper
- *Rachycentron canadum* Cobia
- *Lutjanus griseus* Gray Snapper
- *Lutjanus mahogoni* Mahogany Snapper
- *Eugerres plumieri* Striped Mojarra
- *Equetus lanceolatus* Jackknife-fish
- *Equetus punctatus* Spotted Drum
- *Sciaenops ocellatus* Red Drum
- *Prognathodes aculeatus* Longsnout Butterflyfish
- *Stegastes partitus* Bicolor Damselfish
- *Labrisomus nuchipinnis* Hairy Blenny
- *Stathmonotus hemphilli* Blackbelly Blenny
- *Dormitator maculatus* Fat Sleeper
- *Erotelis smaragdus* Emerald Sleeper
- *Paralichthys albigutta* Gulf Flounder

## Invertebrates

- *Ircinia campana* Vase Sponge
- *Spherospongia vesparia* Loggerhead Sponge

- *Cladocora arbuscula*
- *Manicina areolata*
- *Solenastrea bournoni*
- *Solenastrea hyades*
- *Isophyllia sinuosa*
- *Scolymia lacera*
- *Oculina diffusa*
- *Astrangia poculata*
- *Astrangia solitaria*
- *Crassostrea virginica*
- *Isognomon alatus*
- *Isognomon bicolor*
- *Isognomon radiatus*
- *Littoraria angulifera*
- *Fasciolaria liliium*
- *Busycon sinistrum*
- *Elysia crispata*
- *Oreaster reticulatis*
- *Holothuria floridana*
- *Ophiophragmus filigraneus*
- *Limulus polyphemus*
- *Cardisoma guanhumi*
- *Aratus pisonii*
- *Goniopsis cruentata*
- *Uca minax*
- *Uca pugilator*
- *Uca pugnax*
- *Panulirus argus*
- *Heterachthes sablensis*
- *Didemnum vanderhorst*
- *Eudistoma species indeterminata*
- Tube Coral
- Rose Coral
- Smooth Star Coral
- Knobby Star Coral
- Sinuuous Cactus Coral
- Atlantic Mushroom Coral
- Diffuse Ivory Bush Coral
- Northern Star Coral
- A Coral
- Eastern Oyster
- Tree Oyster
- Tree Oyster
- Tree Oyster
- Mangrove Periwinkle
- Banded Tulip
- Lightning Whelk
- Lettuce Slug
- Cushion Star, Bahama Star
- Florida Sea Cucumber
- Brittle Star
- Horseshoe Crab
- Great Land Crab (Blue Land Crab)
- Mangrove Crab
- Mangrove Crab
- Red-jointed Fiddler, Brackish Water Fiddler
- Sand Fiddler
- Mud Fiddler
- Spiny Lobster
- Cape Sable Longhorn
- Tunicate
- Strawberry Tunicate

## Conservation Threats

Habitat-specific threats to Mangrove Swamp include reduction in freshwater flows from dam operations, lack of tidal fluctuation caused by mosquito impoundments, loss of mangroves from inappropriate pruning by coastal property owners, and coastal development.

Threats to Mangrove Swamp habitats that were also identified for multiple other habitats are addressed in the Chapter Multiple Habitat Threats and Conservation Actions. These threats include:

- Channel modification/shipping lanes
- Chemicals and toxins
- Climate variability
- Coastal development
- Dam operations/incompatible release of water (quality, quantity, timing)
- Fishing gear impacts
- Harmful algal blooms
- Incompatible fishing pressure
- Incompatible industrial operations
- Incompatible recreational activities
- Incompatible wildlife and fisheries management strategies
- Industrial Spills

- Invasive animals
- Invasive plants
- Management of nature (beach nourishment and impoundments)
- Nutrient loads (urban)
- Roads, bridges and causeways
- Shoreline hardening
- Surface water and groundwater withdrawal
- Vessel impacts

The following stresses and sources of stress threaten this habitat:

<b>Stresses</b>		<b>Habitat Stress Rank</b>
A	Altered hydrologic regime	Very High
B	Habitat destruction	Very High
C	Altered structure	High
D	Altered water quality–contaminants	High
E	Altered weather regime/sea level rise	High
F	Altered species composition	High
G	Habitat disturbance	High
H	Habitat fragmentation	High

The sources of stress, or threats, were used to generate conservation actions.

<b>Sources of Stress</b>		<b>Habitat Source Rank</b>	<b>Related Stresses</b> (see above)
1	Coastal development	Very High	A,B, C, D, G, H
2	Roads, bridges and causeways	High	A, B, D, F, G, H
3	Harmful algal blooms	High	B, F, G
4	Incompatible industrial operations	High	B, D, F, G, H
5	Invasive plants	High	B, C, F, G
6	Shoreline hardening	High	A, B, F, G, H
7	Invasive animals	High	B, F, G
8	Dam operations/incompatible release of water (quality, quantity, timing)	High	A, B, D, F, G
9	Incompatible wildlife and fisheries management strategies	High	B,C
10	Climate variability	High	A, B, E, H
11	Parasites/pathogens	High	B, F, G
12	Channel modification/shipping lanes	High	A, B, F, G, H
13	Incompatible aquaculture operations	High	B, H
14	Chemicals and toxins	High	B, D, F, G
15	Nutrient loads (all sources)	High	D, F, G
16	Acoustic pollution	High	B
17	Inadequate stormwater management	Medium	A, B, D, F, G
18	Industrial spills	Medium	B, D, F, G

Sources of Stress		Habitat Source Rank	Related Stresses (see above)
19	Boating impacts	Medium	B, C, F, G, H
20	Incompatible fishing pressure	Medium	F, G, H
21	Solid waste	Medium	B, C, G, H
22	Management of nature (beach nourishment, impoundments)	Medium	A, B, F, G
23	Fishing gear impacts	Medium	B, C, G
24	Surface water withdrawal	Medium	A, F, G
25	Utility corridors	Medium	B, C, G
26	Groundwater withdrawal	Medium	A, F, G
27	Incompatible recreational activities	Medium	B, D, F, G
28	Thermal pollution	Medium	F, G
29	Placement of artificial structures	Medium	B, C
<b>Statewide Threat Rank of Habitat</b>		<b>Very High</b>	

## Conservation Actions

Actions to abate the threats to Mangrove Swamp that were also identified as statewide marine and estuarine threats (see list above) are in the Chapter Multiple Habitat Threats and Conservation Actions. However, experts identified outcomes to reduce damaging mangrove trimming, restore appropriate freshwater flows, and reconnect existing salt marsh/mangrove impoundments to tide and manage to maximize resource values while maintaining adequate levels of mosquito control.

Highest ranked actions identified for abating this source of stress focus on:

- Improving the detection of pathogens, parasites, and biotoxins in marine organisms and the ability to rehabilitate impacted animals

Additional actions included:

- Providing training on appropriate mangrove trimming to landscape maintenance and wetlands professionals
- Evaluating whether parasites are indicators of estuarine and marine health.

The following actions, organized by action type were identified to abate this threat:

### *Climate Change*

Overall Rank	Land/Water/Species Management	Feasibility	Benefits	Cost
L	Using GIS, identify modifications to mangroves and marshes, use restoration techniques to reverse modifications, and include consideration of sea level rise in restoration goal.	L	M	VH

### *Coastal Development*

Overall Rank	Education and Awareness	Feasibility	Benefits	Cost
M	Issue continuing education credits for proper mangrove trimming. This could be for professional wetland scientists, certified ecologists, landscape architects, arborists, landscapers. Improve knowledge of mangroves through certification program. Link with herbicide application CEU's to ensure increased participation.	VH	L	L
Overall Rank	Land/Water/Species Management	Feasibility	Benefits	Cost
M	Improve understanding of watercraft speed limits/zones, and work with all affected parties to explore options for reassessing speed zones.	H	M	M

### *Parasites/Pathogens*

Overall Rank	Land/Water/Species Management	Feasibility	Benefits	Cost
H	Improve capabilities for/sophistication of inspection, recognition, and treatment of aquatic organism diseases and parasites.	VH	M	M
H	Continue and support response teams/hotlines associated with disease outbreak, trauma, strandings, and mortality events for fish and wildlife species.	VH	M	M
L	Expand the number and capabilities of rehabilitation facilities for diseased marine mammals and reptiles.	H	L	VH
Overall Rank	Research	Feasibility	Benefits	Cost
H	Conduct additional research for aquatic wildlife parasites and diseases. and the impacts of biotoxins on fish and wildlife resources.	VH	M	H
H	Synthesize and consolidate understanding, and identification of gaps in understanding, of marine flora/fauna diseases, pathogens, biotoxins, including slime mold on seagrasses and oyster disease.	VH	M	L
M	Research and examine use of parasites as indicators of estuarine and marine health.	VH	L	M