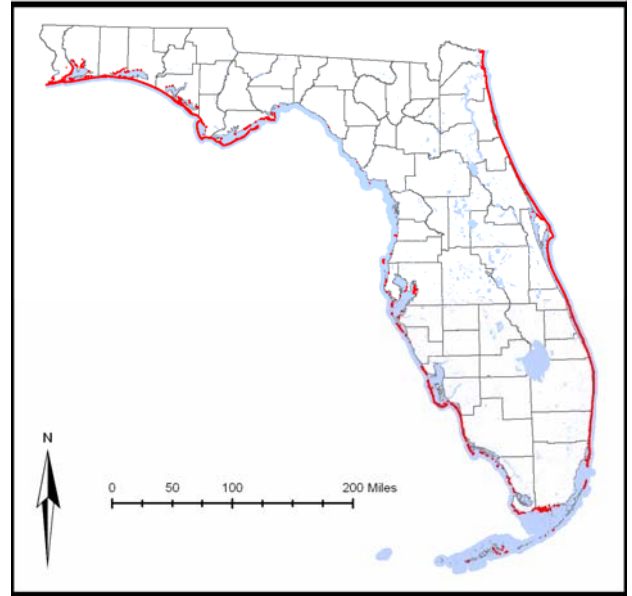


Beach/Surf Zone



Status

Current condition: Good and declining. According to the best available GIS information at this time (see Appendix D. GIS Data Tables), 32,295 acres (13,069 ha) of Beach/Surf Zone habitat exist, of which 46% (14,858 ac; 6,013 ha) are in existing conservation or managed areas. Another 1% (312 ac; 126 ha) are Florida Forever projects and 5% (1,473 ac; 596 ha) are SHCA-identified lands. The remaining 48% (15,652 ac; 6,334 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: Beach Dune

The Beach/Surf Zone is the long, often narrow strip of sand and shells between the tides. Daily flooding by salt water and moderate- to high-energy waves prohibit plant growth except for some inconspicuous algae. Low-energy beaches provide important spawning habitat for horseshoe crabs and feeding habitat for multiple species of shorebirds. Beach dunes are mounds of wind-blown sand that are periodically inundated by seawater during extreme high tides and storms. Vegetation on beach dunes varies regionally in Florida but is restricted to a few highly specialized terrestrial plants.

Florida beaches are important nesting sites for several species of shorebirds and wintering grounds for others. Beaches are also vital nesting sites for many sea turtles and support numerous other mammals and invertebrates. The surf zone is an important nursery and feeding habitat for many species of fish including Permit and Florida Pompano.

Associated Species of Greatest Conservation Need

Mammals

- | | |
|--|------------------------------|
| • <i>Peromyscus polionotus allophrys</i> | Choctawhatchee Beach Mouse |
| • <i>Peromyscus polionotus leucocephalus</i> | Santa Rosa Beach Mouse |
| • <i>Peromyscus polionotus niveiventris</i> | Southeastern Beach Mouse |
| • <i>Peromyscus polionotus peninsularis</i> | St. Andrews Beach Mouse |
| • <i>Peromyscus polionotus phasma</i> | Anastasia Island Beach Mouse |
| • <i>Peromyscus polionotus trissyllepsis</i> | Perdido Key Beach Mouse |
| • <i>Procyon lotor auspicatus</i> | Key Vaca Raccoon |
| • <i>Procyon lotor incautus</i> | Key West Raccoon |
| • <i>Spilogale putorius</i> | Spotted Skunk |
| • <i>Trichechus manatus latirostris</i> | Florida Manatee |
| • <i>Eubalaena glacialis</i> | North Atlantic Right Whale |
| • <i>Tursiops truncatus</i> | Atlantic Bottlenose Dolphin |

Birds

- | | |
|---|------------------------|
| • <i>Sula dactylatra</i> | Masked Booby |
| • <i>Pelecanus occidentalis</i> | Brown Pelican |
| • <i>Egretta rufescens</i> | Reddish Egret |
| • <i>Falco columbarius</i> | Merlin |
| • <i>Falco peregrinus</i> | Peregrine Falcon |
| • <i>Charadrius alexandrinus tenuirostris</i> | Cuban Snowy Plover |
| • <i>Charadrius wilsonia</i> | Wilson's Plover |
| • <i>Charadrius melodus</i> | Piping Plover |
| • <i>Haematopus palliatus</i> | American Oystercatcher |
| • <i>Numenius phaeopus hudsonicus</i> | Whimbrel |
| • <i>Limosa fedoa</i> | Marbled Godwit |
| • <i>Calidris canutus rufa</i> | Red Knot |
| • <i>Calidris alba</i> | Sanderling |
| • <i>Calidris pusilla</i> | Semipalmated Sandpiper |
| • <i>Calidris mauri</i> | Western Sandpiper |
| • <i>Sterna nilotica</i> | Gull-billed Tern |
| • <i>Sterna caspia</i> | Caspian Tern |
| • <i>Sterna maxima</i> | Royal Tern |
| • <i>Sterna sandvicensis</i> | Sandwich Tern |
| • <i>Sterna dougallii</i> | Roseate Tern |
| • <i>Sterna antillarum</i> | Least Tern |
| • <i>Sterna anaethetus</i> | Bridled Tern |
| • <i>Sterna fuscata</i> | Sooty Tern |
| • <i>Anous stolidus</i> | Brown Noddy |
| • <i>Rynchops niger</i> | Black Skimmer |

Reptiles

- | | |
|----------------------------|--------------------|
| • <i>Crocodylus acutus</i> | American Crocodile |
|----------------------------|--------------------|

- *Malaclemys terrapin* Diamondback Terrapin
- *Chelonia mydas* Green Turtle
- *Eretmochelys imbricata* Hawksbill
- *Caretta caretta* Loggerhead
- *Lepidochelys kempii* Kemp's Ridley
- *Dermochelys coriacea* Leatherback
- *Eumeces egregius egregius* Florida Keys Mole Skink
- *Eumeces egregius insularis* Cedar Key Mole Skink

Fish

- *Ginglymostoma cirratum* Nurse Shark
- *Carcharhinus brevipinna* Spinner Shark
- *Carcharhinus isodon* Finetooth Shark
- *Carcharhinus leucas* Bull Shark
- *Carcharhinus limbatus* Blacktip Shark
- *Carcharhinus plumbeus* Sandbar Shark
- *Galeocerdo cuvier* Tiger Shark
- *Negaprion brevirostris* Lemon Shark
- *Rhizoprionodon terraenovae* Atlantic Sharpnose Shark
- *Sphyrna mokarran* Great Hammerhead
- *Sphyrna tiburo* Bonnethead
- *Sphyrna zygaena* Smooth Hammerhead
- *Carcharias taurus* Sand Tiger
- *Megalops atlanticus* Tarpon
- *Albula vulpes* Bonefish
- *Mugil curema* White Mullet
- *Mugil gyrans* Whirligig Mullet
- *Mugil sp.* Redeye Mullet
- *Pomatomus saltatrix* Bluefish
- *Rachycentron canadum* Cobia
- *Selar crumenophthalmus* Bigeye Scad
- *Trachinotus carolinus* Florida Pompano
- *Trachinotus falcatus* Permit
- *Trachinotus goodei* Palometa
- *Lutjanus griseus* Gray Snapper
- *Cynoscion nebulosus* Spotted Seatrout
- *Cynoscion regalis* Weakfish
- *Sciaenops ocellatus* Red Drum
- *Scomberomorus cavalla* King Mackerel
- *Scomberomorus maculatus* Spanish Mackerel
- *Etropus crossotus* Fringed Flounder
- *Paralichthys albigutta* Gulf Flounder
- *Paralichthys dentatus* Summer Flounder
- *Paralichthys lethostigma* Southern Flounder

Invertebrates

- *Donax variabilis* Variable Coquina
- *Limulus polyphemus* Horseshoe Crab
- *Coenobita clypeatus* Land Hermit Crab
- *Emerita benedicti* Mole Crab
- *Ocypode quadrata* Ghost Crab

Conservation Threats

Threats to the Beach/Surf Zone habitat that were also identified for multiple other terrestrial habitats are addressed in the Chapter Multiple Habitat Threats and Conservation Actions. These threats include:

- Channel modification/shipping lanes
- Climate variability
- Incompatible recreational activities
- Invasive animals
- Shoreline hardening

Threats to Beach/Surf Zone habitat that were also identified for multiple other marine and estuarine 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
- Disruption of longshore transport of sediments
- 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
- Key predator/herbivore losses
- Management of nature–beach nourishment
- Nutrient loads
- Roads, bridges and causeways
- Shoreline hardening
- Vessel impact

Beach/Surf Zone-specific land-based threats are similar to those for the Coastal Strand habitat. Because of the importance of these habitats for coastal SGCN, such as sea turtles, shorebirds, and beach mice, threats such as light pollution that can inhibit turtle nesting and increase predation for these and other species were highlighted. Dredging of new inlets and deposition of dredged materials for beach nourishment, dune restoration, and other purposes degrade these habitats and can directly impact these species, as can disturbance and predation by nuisance animals. While beach nourishment was primarily viewed as a threat, experts understood the related benefits of habitat restoration, particularly for sea turtles. Activities of residents and their pets living adjacent to Beach/Surf Zone and using the habitat can cause degradation. Military base closure threatens potential conservation protection for Beach/Surf Zone. This habitat also faces numerous water-based threats, such as those caused by changes in natural sediment movement, contamination from industrial spills or urban runoff, and incompatible boating and fishing recreational activities.

The following stresses (and sources of stress below) threaten this habitat in terrestrial habitats:

Stresses		Habitat Stress Rank
A	Habitat degradation/disturbance	Very High
B	Erosion/sedimentation	High
C	Excessive depredation and/or parasitism	High
D	Altered soil structure and chemistry	High
E	Insufficient size/extent of characteristic communities or ecosystems	Medium

The sources of stress, or threats, were used to generate conservation actions. The following sources of stress are threats identified for terrestrial habitats.

Sources of Stress		Habitat Source Rank	Related Stresses (see above)
1	Incompatible recreational activities	Very High	A, C, D
2	Sea level rise	High	B, E
3	Shoreline hardening	High	A, B, D, E
4	Management of nature–nourishment	High	A, B, D, E
5	Light pollution	High	A, C
6	Invasive animals	High	C
7	Management of nature–inlet relocation and dredging	High	B, D
8	Nuisance animals	Medium	A, C
9	Channel modification/shipping lanes	Medium	A, B, E
10	Management of nature–beach raking	Medium	A, B
11	Management of nature–driving for maintenance	Low	A, C
Statewide Threat Rank of Habitat		Very High	

The following stresses (and sources of stress below) threaten this habitat in marine and estuarine habitats:

Stresses		Habitat Stress Rank
F	Erosion	Very High
G	Habitat destruction	Very High
H	Altered weather regime/sea level rise	High
I	Habitat disturbance	High
J	Altered structure	Medium
K	Habitat fragmentation	Medium

The following sources of stress are threats identified for marine and estuarine habitats:

Sources of Stress		Habitat Source Rank	Related Stresses (see above)
1	Climate variability	Very High	F, G, H, K
2	Coastal development	Very High	F, G, I, J, K
3	Roads, bridges and causeways	Very High	F, G, I, J, K
4	Shoreline hardening	High	F, G, I, J, K
5	Disruption of longshore transport of sediments	High	F, G, I, J, K
6	Management of nature (beach nourishment, impoundments)	High	I, J, K
7	Harmful algal blooms	High	I
8	Incompatible industrial operations	High	F, G, H, I, J, K
9	Invasive plants	High	I, J, K
10	Channel modification/shipping lanes	High	F, G, I, J
11	Nutrient loads (all sources)	High	I
12	Key predator/herbivore losses	High	I
13	Dam operations/incompatible release of water	High	F, I
14	Industrial spills	Medium	I
15	Invasive animals	Medium	I
16	Light pollution	Medium	I
17	Chemicals and toxins	Medium	I
18	Incompatible resource extraction: mining/drilling	Medium	F, G, I, J
19	Incompatible fishing pressure	Medium	I
20	Incompatible recreational activities	Medium	I
21	Inadequate stormwater management	Medium	F, I
22	Utility corridors	Medium	F, G
23	Sonic pollution	Medium	I
24	Fishing gear impacts	Medium	I
25	Vessel impacts	Medium	I
26	Solid waste	Medium	I, J, K
27	Incompatible wildlife and fisheries management strategies	Medium	I
28	Incompatible aquaculture operations	Low	I
Statewide Threat Rank of Habitat		Very High	

Conservation Actions

Actions to abate the threats to the Beach/Surf Zone habitat that were also identified as statewide threats (see lists above in Conservation Threats section) are in the Chapter. Multiple Habitat Threats and Conservation Actions.

The actions below address specific threats identified with the Beach/Surf Zone habitat (sometimes in conjunction with a few additional habitats). Actions specific to this habitat were identified in both the terrestrial and marine workshops. These voluntary and incentive-based actions were designed to reduce the need for beach nourishment through reduction of activities that cause sediment movement and protection of shorelines from development and other voluntary and incentive-based actions that might require nourishment. Other actions are identified improvements needed to prevent chemical spills, and changes to and education about fishing and boating activities that will reduce threats to coastal SGCN.

TERRESTRIAL-BASED ACTIONS

Light Pollution

Overall Rank	Capacity Building	Feasibility	Benefits	Cost
H	Ensure through state and local cooperation that coastal lighting ordinances are updated as technology and information improves.	VH	M	L
Overall Rank	Education and Awareness	Feasibility	Benefits	Cost
M	Support cooperative education programs developed and/or implemented by utility companies and local governments for coastal property owners to ensure that light ordinances protecting coastal wildlife are supported (e.g., availability of automatic light shut-off features for beach lights).	VH	L	M
Overall Rank	Land/Water/Species Management	Feasibility	Benefits	Cost
M	Support and expand the coastal light replacement efforts of the U.S. Fish and Wildlife Service to be implemented statewide where sea turtle nesting and beach mouse habitat exists.	H	M	H
Overall Rank	Policy	Feasibility	Benefits	Cost
H	Support sea turtle and beach mouse-friendly lighting in coastal habitats. Fund incentives for retrofitting existing light features.	VH	M	H
M	Support installation of appropriate light technology for conservation of sea turtles and other coastal species on military lands, Kennedy Space Center, and ports (domestic security facilities).	M	M	H

Nuisance Animals

Overall Rank	Economic and Other Incentives	Feasibility	Benefits	Cost
M	Increase funding to implement existing sea turtle management practices and ordinances regarding prevention of egg and hatchling predation. Promote the use of volunteer groups in association with the FWC to provide more capacity for implementation.	VH	L	M

Overall Rank	Education and Awareness	Feasibility	Benefits	Cost
M	Identify important habitat areas for nesting shorebirds (of Greatest Conservation Need), and reduce impacts from people and pets (as appropriate) from these areas through targeted education and signage.	VH	L	M
L	Educate public landowners with responsibilities for coastal zone wildlife conservation about USDA protocols for raccoon management.	H	L	L
L	Develop public education tools on and encourage removal of unconsumed pet foods from outdoor containers.	L	M	M
L	Educate home and business owners on the use of wildlife-proof garbage containers.	H	L	H
Overall Rank	Land/Water/Species Management	Feasibility	Benefits	Cost
L	Encourage understanding of existing pet restraint rules.	M	L	M
Overall Rank	Planning and Standards	Feasibility	Benefits	Cost
M	Future public lands management plans for coastal managed areas should consider inclusion of control plans for feral animals.	H	M	M
L	Develop techniques for waste management in areas where SGCN or habitats are subject to high depredation or disturbance rates by exotic and nuisance animals with populations elevated by access to garbage (providing a supplemental food source).	M	L	L
Overall Rank	Policy	Feasibility	Benefits	Cost
M	Assist counties, municipalities, and homeowner associations to develop and implement curbside pick-up of yard and household waste.	H	M	M

TERRESTRIAL-AND-MARINE-BASED ACTIONS

Management of Nature – Dredging

Overall Rank	Capacity Building	Feasibility	Benefits	Cost
M	Assist in the development of statewide, system-specific dredge material disposal plans that identify long-term disposal sites, specify dredge deposition practices, and minimize or offset impacts to all fish and wildlife resources. Encourage linking the statewide dredge material management plan to port expansion management plans.	M	M	M
Overall Rank	Education and Awareness	Feasibility	Benefits	Cost
L	Assist in the development of educational programs on natural coastal processes and the ecological benefits and impacts, and economic costs of beach nourishment efforts.	H	L	L
L	Provide technical expertise on impacts of beach dredging/nourishment projects.	L	M	M
L	Assist in the development of criteria for long-term monitoring of dredging and nourishment projects.	M	L	L
Overall Rank	Land/Water/Species Management	Feasibility	Benefits	Cost
L	Discourage dredging of natural inlets and passes not designated for navigation.	L	M	M
Overall Rank	Planning and Standards	Feasibility	Benefits	Cost

L	Develop one or several coalitions of local groups statewide to identify local restoration projects where dredge material can be used.	M	L	L
Overall Rank	Research	Feasibility	Benefits	Cost
L	Compare the cost of conducting dredge/nourishment projects in perpetuity to spending equal state/federal dollars on acquiring lands subject to erosion (barrier islands) and putting those lands into uses that are not dependent upon dredging.	H	L	L
L	Fund research on the impacts of beach nourishment on fish and wildlife resources.	H	L	L

MARINE-BASED ACTIONS

Disruption of Longshore Transport of Sediments

Overall Rank	Education and Awareness	Feasibility	Benefits	Cost
L	Provide outreach to the public and to land-use, planning, and regulation agencies so they have a better understanding of barrier island dynamics and natural sediment movement (FEMA-like map). Include cost-benefit information on environmental communities affected.	M	L	L
L	Assist in the development of educational tools about the ephemeral characteristics of natural inlets and provide technical expertise on the fish and wildlife resources associated with this habitat.	L	M	M
Overall Rank	Land/Water/Species Management	Feasibility	Benefits	Cost
M	Encourage restoration of natural sediment transport processes as an alternative to beach nourishment where possible.	L	H	M
L	Improve implementation of sediment management practices.	L	M	L
Overall Rank	Policy	Feasibility	Benefits	Cost
M	Assist in the revision of national flood insurance programs and provide technical expertise on fish and wildlife resources for areas of high sediment transport and unstable shorelines.	M	M	L
Overall Rank	Research	Feasibility	Benefits	Cost
H	Conduct an economic analysis of maintaining structures such as inlets and hardened shorelines that includes benefits and impacts to fish and wildlife resources.	M	H	M
M	Conduct regional studies on sediment transport budget and natural sediment processes (not site by site). Collect and map historic information on barrier islands and estuarine sand bars.	M	M	M

Management of Nature–Beach Nourishment

Overall Rank	Capacity Building	Feasibility	Benefits	Cost
M	Establish a statewide data clearinghouse or public-private partnership to house all beach nourishment project monitoring results to facilitate the evaluation of cumulative project effects and future project design (i.e., lessons learned). Review the economics of projects including natural resource values pre- and post-project construction. Synthesize the data collected from all projects.	M	M	M
Overall Rank	Education and Awareness	Feasibility	Benefits	Cost

H	Assist in the development of educational materials about the impacts of coastal development; provide technical expertise on impacts to coastal fish and wildlife resources.	VH	M	M
M	Encourage beach resorts to protect turtle nests through awareness and education programs and by providing support for beach assessment teams (room and board). Provide funding for organizations that provide awareness support.	H	M	L
Overall Rank	Land/Water Protection	<i>Feasibility</i>	<i>Benefits</i>	Cost
VH	Acquire coastal lands for habitat protection and management to reduce the need for beach nourishment.	VH	VH	VH
H	Acquire more land where sea turtles are nesting and are known to nest. Support Florida Forever funding to accommodate a specific coastal zone acquisition component similar to the "Blue Acres" coastal protection program in New Jersey.	H	H	VH
Overall Rank	Land/Water/Species Management	<i>Feasibility</i>	<i>Benefits</i>	Cost
M	Investigate and develop, as necessary, sand management technologies to avoid using beach nourishment. Develop statewide BMPs for sand management.	M	M	M
L	Identify and prioritize beach dune restoration projects where possible and warranted. Be proactive as a means of avoiding the need for beach nourishment where possible. (Potential partner is the USACE.)	M	M	M
L	Establish a statewide beach dune restoration protocol for nourishment projects. (Determine if there are existing similar programs. If so, document their requirements and protocols.)	M	L	L
Overall Rank	Planning and Standards	<i>Feasibility</i>	<i>Benefits</i>	Cost
L	Review state database to avoid known potential impacts and work with affected parties to develop avoidance, minimization, and mitigation strategies for future nourishment actions.	H	M	M

Industrial Spills

Overall Rank	Planning and Standards	<i>Feasibility</i>	<i>Benefits</i>	Cost
M	Assist in the revision of emergency response plans in cooperation with the county EOCs, FDEP, DCA, and USCG for coastal waters where water-borne transport of oil and chemicals occur. Encourage bi-annual updates.	H	M	M
M	Assist in the revision of emergency response plans in cooperation with the county EOCs, FDEP, DCA, USCG and EPA for coastal waters that may be subject to land-based spills of oil and chemicals. Encourage bi-annual updates.	H	M	M

Incompatible Fishing Pressure

Overall Rank	Capacity Building	<i>Feasibility</i>	<i>Benefits</i>	Cost
M	Support an independent peer review of current fishery stock assessments of near-shore marine species.	H	M	H
Overall Rank	Education and Awareness	<i>Feasibility</i>	<i>Benefits</i>	Cost
M	Develop and implement an outreach strategy for subsistence fishers to better understand their impacts on nearshore fish populations.	VH	L	M
Overall Rank	Land/Water Protection	<i>Feasibility</i>	<i>Benefits</i>	Cost
M	Review effectiveness of current no-take areas.	L	H	H

Incompatible Recreational Activities

Overall Rank	Education and Awareness	<i>Feasibility</i>	<i>Benefits</i>	Cost
M	Educate boaters, especially new boat operators, about sensitive areas and proper boating techniques, including anchoring, through an outreach program (kiosks, pamphlets, and signage). Develop Boater Guides for areas where they are currently unavailable and distribute at the time of boater registration and at boat rental offices.	M	M	H
L	Conduct an outreach program to educate beachgoers and other recreational users about the impact of collecting live shells.	H	L	L
Overall Rank	Land/Water/Species Management	<i>Feasibility</i>	<i>Benefits</i>	Cost
M	Encourage the use of buffers to sensitive wildlife and habitat areas. Develop multi-use plans that include use of sensitive areas and areas for human use.	H	M	H
L	Initiate a statewide underwater coastal cleanup.	M	L	M
Overall Rank	Research	<i>Feasibility</i>	<i>Benefits</i>	Cost
M	Where information is lacking, conduct study(ies) to assess cumulative impacts of human use of beach habitats. Consider already shifted baselines.	M	M	H