

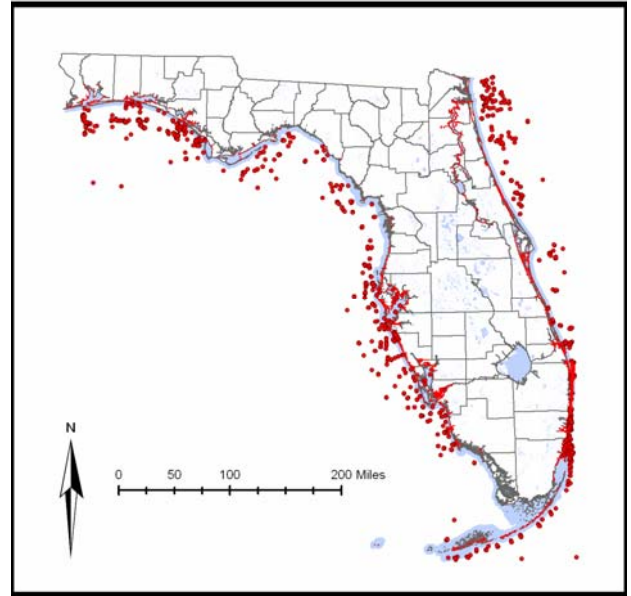
# Artificial Structure



## Status

Current condition: Unknown.

According to the best available GIS information at this time (see Appendix D. GIS Data Tables), over 2,000 artificial reefs and 4,368 miles (7,030 km) of hardened shoreline are known to exist.



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

## Habitat Description

**FNAI type:** None

This artificial habitat is comprised of two major types of man-made structures in marine and estuarine waters—artificial reefs and hardened shorelines. Both of these structures create “Hard Bottom” habitat but after the initial deployment they typically are not actively managed as a habitat. There are multiple research and monitoring programs focusing on the impacts and benefits of these artificial habitats.

Artificial reefs are created to increase reef fish habitat, enhance recreational fishing and diving opportunities, provide socio-economic benefits to local coastal communities, and facilitate reef fish related research. Florida has one of the most active artificial reef programs among the 14 Gulf and Atlantic states involved in this activity. Thirty-four of 35 Florida coastal counties are or have been involved in artificial reef development, most of which has occurred in the last 20 years. Approximately 30 to 50 artificial reefs are constructed annually off Florida using a combination of federal, state, local, and private funds.

Hardened shorelines differ from artificial reefs in that they are a result of coastal development. Hardened shorelines include rip-rap and other types of coastal armoring as well as breakwaters, piers, and docks. These structures may also provide habitat for some sessile bivalves, crustaceans, and limited fish communities. In many cases they can negatively impact wildlife such as nesting sea turtles and shore birds, alter natural marine and estuarine shoreline processes, and alter or replace naturally-occurring coastal habitats such as marsh, beach, and dune.

Herein the term “Artificial Structure” includes structures (artificial reefs) specifically designed and placed to enhance natural populations of species associated with hard bottom and/or reef substrates as well as structures (breakwaters, seawalls) designed to moderate or eliminate natural coastal processes such as erosion. As artificial reefs are considered a tool for management (restoration or enhancement) of species associated with hard bottom or reef habitats, future versions of the Strategy should evaluate the management implications of artificial structures.

## Associated Species of Greatest Conservation Need

### **Mammals**

- |   |                             |
|---|-----------------------------|
| • <i>Procyon lotor auspicatus</i>       | Key Vaca Raccoon            |
| • <i>Procyon lotor incautus</i>         | Key West Raccoon            |
| • <i>Trichechus manatus latirostris</i> | Florida Manatee             |
| • <i>Tursiops truncatus</i>             | Atlantic Bottlenose Dolphin |

### **Birds**

- |                                 |                        |
|---------------------------------|------------------------|
| • <i>Pelecanus occidentalis</i> | Brown Pelican          |
| • <i>Haematopus palliatus</i>   | American Oystercatcher |

### **Reptiles**

- |                                 |               |
|---------------------------------|---------------|
| • <i>Eretmochelys imbricata</i> | Hawksbill     |
| • <i>Caretta caretta</i>        | Loggerhead    |
| • <i>Lepidochelys kempii</i>    | Kemp's Ridley |

### **Fish**

- |                                    |                          |
|------------------------------------|--------------------------|
| • <i>Ginglymostoma cirratum</i>    | Nurse Shark              |
| • <i>Carcharhinus leucas</i>       | Bull Shark               |
| • <i>Carcharhinus limbatus</i>     | Blacktip Shark           |
| • <i>Carcharhinus perezii</i>      | Reef Shark               |
| • <i>Galeocerdo cuvier</i>         | Tiger Shark              |
| • <i>Negaprion brevirostris</i>    | Lemon Shark              |
| • <i>Rhizoprionodon terranovae</i> | Atlantic Sharpnose Shark |
| • <i>Sphyrna mokarran</i>          | Great Hammerhead         |
| • <i>Sphyrna tiburo</i>            | Bonnethead               |
| • <i>Carcharias taurus</i>         | Sand Tiger               |
| • <i>Megalops atlanticus</i>       | Tarpon                   |
| • <i>Gymnothorax funebris</i>      | Green Moray              |
| • <i>Gymnothorax miliaris</i>      | Goldentail Moray         |
| • <i>Gymnothorax moringa</i>       | Spotted Moray            |
| • <i>Gymnothorax vicinus</i>       | Purplemouth Moray        |
| • <i>Opsanus beta</i>              | Gulf Toadfish            |

- |                                      |                      |
|--------------------------------------|----------------------|
| • <i>Opsanus pardus</i>              | Leopard Toadfish     |
| • <i>Opsanus tau</i>                 | Oyster Toadfish      |
| • <i>Centropristis ocyurus</i>       | Bank Sea Bass        |
| • <i>Centropristis philadelphica</i> | Rock Sea Bass        |
| • <i>Epinephelus itajara</i>         | Goliath Grouper      |
| • <i>Epinephelus morio</i>           | Red Grouper          |
| • <i>Apogon maculatus</i>            | Flamefish            |
| • <i>Apogon pseudomaculatus</i>      | Twospot Cardinalfish |
| • <i>Lobotes surinamensis</i>        | Atlantic Tripletail  |
| • <i>Anisotremus surinamensis</i>    | Black Margate        |
| • <i>Haemulon album</i>              | Margate              |
| • <i>Holacanthus bermudensis</i>     | Blue Angelfish       |
| • <i>Holacanthus tricolor</i>        | Rock Beauty          |
| • <i>Stegastes adustus</i>           | Dusky Damselfish     |
| • <i>Stegastes leucostictus</i>      | Beaugregory          |
| • <i>Thalassoma bifasciatum</i>      | Bluehead             |
| • <i>Gobiesox strumosus</i>          | Skilletfish          |
| • <i>Thunnus atlanticus</i>          | Blackfin Tuna        |
| • <i>Etropus crossotus</i>           | Fringed Flounder     |
| • <i>Diodon holocanthus</i>          | Balloonfish          |

### **Invertebrates**

- |                                |                        |
|--------------------------------|------------------------|
| • <i>Spondylus americanus</i>  | Atlantic Thorny Oyster |
| • <i>Littoraria angulifera</i> | Mangrove Periwinkle    |
| • <i>Clibanarius vittatus</i>  | Thinstripe Hermit Crab |
| • <i>Aratus pisonii</i>        | Mangrove Crab          |
| • <i>Panulirus argus</i>       | Spiny Lobster          |

## Conservation Threats

While threats to its conservation as well as remedial actions were identified during Strategy Science Workshops I and II, the Artificial Structure habitat category was not addressed in TNC workshops that generated tables of ranked threats and actions, as seen in most other habitat categories. The decision to not rank threats and actions for this habitat was made to maximize discussion time for higher-priority habitats and because of some disagreement over recognition of this habitat type as important to wildlife conservation. Therefore, threats and actions are presented as bulleted lists with no prioritization.

The following stresses threaten this habitat:

- |   |   |
|---|---|
| • Absent to insufficient biological legacies                    | • Altered water and/or soil temperature                           |
| • Altered community structure                                   | • Altered water quality of surface water or aquifer: contaminants |
| • Altered hydrologic regime–timing, duration, frequency, extent | • Altered water quality of surface water or aquifer: nutrients    |
| • Altered species composition/dominance                         | • Erosion/sedimentation   |
| • Altered successional dynamics                                 |   |

- Excessive depredation and/or parasitism
- Fragmentation of habitats, communities, ecosystems
- Habitat degradation/disturbance
- Keystone species missing or lacking in abundance
- Missing key communities, functional guilds, or seral stages

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

- Acoustic pollution
- Chemicals and toxins
- Coastal development
- Disruption of longshore transport of sediments
- Fishing gear impacts
- Harmful algal blooms
- Inadequate stormwater management
- Incompatible fishing pressure
- Incompatible recreational activities
- Incompatible wildlife and fisheries management strategies
- Invasive animals
- Invasive plants
- Management of nature–beach nourishment and impoundments
- Nuisance animals
- Nutrient loads–urban
- Parasites/pathogens
- Roads, bridges, and causeways
- Shoreline hardening
- Solid waste

## Conservation Actions

Actions to abate threats to Artificial Structure were largely designed to reduce the impacts of urban activities, and to increase the habitat’s suitability to wildlife. Most of the threats to this habitat (see list above) were also identified for multiple other habitats, and are addressed in the Chapter Multiple Habitat Threats and Conservation Actions. Exceptions are Acoustic pollution, Nuisance animals, and Solid waste.

The actions to abate threats that were identified for Artificial Structure habitat are below, though none were prioritized for implementation.

### ***Law and Policy***

- Encourage coastal development planning that minimizes the demand for shoreline hardening
- Institute seafloor management planning for wildlife habitat retention
- Support policies that reduce waste and increase ease of recycling (e.g., monofilament collection and recycling, municipal composting, water reuse, and curbside recycling)

### ***Research, Education and Awareness***

- Continue to investigate effects of artificial reefs on fish population dynamics
- Develop effective erosion control structures that minimize impacts to marine environment
- Target education for homeowners, developers, construction contractors, and policy makers to benefit wildlife in their day-to-day activities

- Involve community volunteers in wildlife conservation efforts and increase their opportunities for involvement
- Educate homeowners about proper pesticide and fertilizer use and disposal

*Economic and Other Incentives*

- Provide awards to municipalities, organizations, and individuals that implement wildlife-friendly design and management practices
- Provide funds and materials for landowners to remove invasive exotics (e.g., commensal rats, Brazilian pepper, etc)
- Support spay or neuter programs for cats and dogs and reduce number of free-ranging pets