






FLORIDA MARINE DEBRIS REMOVAL GUIDANCE

Methods and Techniques for the Removal of Non-Storm Debris from Marine Habitats

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ABOUT THIS GUIDE

Marine debris is defined as any persistent, manufactured, or processed solid material that is discarded or abandoned in the marine or coastal environment. It is a pervasive pollution problem endangering wildlife, human health and safety, and the environment. The removal of marine debris affects Florida's local ecosystems and economy, where minor, short-term adverse impacts from removal operations can be outweighed by larger scale, long-term benefits of environmental restoration.

The purpose of this Florida Department of Environmental Protection (FDEP) Marine Debris Removal Guidance document is to provide best management practices (BMPs) for the removal of marine debris to minimize adverse environmental impacts during removal operations and to improve preparedness for contractors conducting debris recovery operations within the coastal and marine habitats of Florida. This guide provides information on the policy authority of Federal and State agencies and identifies considerations based on the inherent environmental constraints associated with different habitats and debris removal techniques.

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1. General Guidance / Resources

1.1 How to Use This Guide

Reference the information provided within this document to plan and execute debris removal activities in a manner that minimizes environmental impacts. The guide is organized to provide best management practices (BMPs) based on both sensitive environmental habitats and specific debris removal techniques. Additional resources are provided as attachments to facilitate documentation procedures for specific activities, as well as regulatory and environmental considerations.

Links are provided to consolidated Geographic Information System (GIS) layers containing relevant data and information (see Attachment A and the Marine Debris Removal Resource Map). Links to a Regulatory Considerations Matrix (Attachment B) and Job Aids (Attachment C), which function as decision prompts for debris removal operations, are also provided. Reference the attachments throughout the debris removal process. The guidance in the attachments can be supported with information found in this Guide or through direct contact with the agencies that are referenced.

Use the links for the GIS layers in Attachment A or visit the Marine Debris Removal Resource Map to review geographic information on the sensitive species and environments, agency jurisdictions and areas of special protection, and existing reported marine debris removal projects within the vicinity of the proposed debris removal. Each link will navigate to a separate map which can be viewed by selecting “Open in Map Viewer” in the upper right-hand corner of the weblink. Within each map, zoom to locate the project area and click on sections for additional information.

Use the Regulatory Considerations Matrix (Attachment B) to identify the project-specific concern (Column 1) and the associated agency (Column 2) that would require authorization or consultation for the specific concern. Agency contact information and/or the permits (if required) for authorization to proceed can be found under recommendations (Column 3). Coordination with the agencies shall occur prior to commencement of the debris removal project.

Use the Contractor Job Aids (Attachment C) for a consolidated list of BMPs specific to the environmental habitat that the debris removal project is located within or may impact. The Job Aids should be utilized at each job site as a reference during operations. Within these consolidated guides, the preferred method of removal is described in addition to BMPs.

1.2 Contractor Responsibilities

The Contractor's responsibilities may vary based on client and contract needs but will generally include the identification of coastal debris in the area of interest, site access including land ownership approvals (as required), on land and on water staging (as required), careful and comprehensive removal of marine debris from sensitive and protective habitats, emergency environmental protection measures when and where applicable, provision of both land-based and water-based marine debris transport, marine debris disposal (sustainable when possible and practicable), data collection and reporting, permit acquisition (if required), and related services. Environmental concerns should be fully understood, and the best practices detailed in this document shall be applied.

Marine debris removal contractors working in Yankeytown, Levy County, Florida (Source: Terrell Jones, FWC)

Additional requirements may be applicable for work within marine sanctuaries, wildlife refuges, and aquatic preserves. The Contractor shall determine if they are working within areas of special protection and abide by the more restrictive practices for debris removal. Contractors are recommended to record the debris removal process, including the use of photo and video files. Recommended documents include salvage forms and activity hazard assessments.

1.3 Historical and Cultural Resource Considerations

If prehistoric or historic artifacts, such as pottery or ceramics, projectile points, dugout canoes, metal implements, historic building materials, or any other physical remains that could be associated with Native American, early European, or American settlements are encountered, the Contractor shall cease all debris removal activities in that location which involve disturbance in the vicinity of the discovery. Leave all artifacts in place and contact the Florida Division of Historical Resources (850-245-6300).

1.4 Environmental Considerations

Prevention and avoidance of environmental damage should be a primary focus for marine debris removal operations. The recommendations in this document are designed to minimize adverse effects to natural habitats and wildlife. Environmental considerations will apply on a case-by-case basis; site-specific factors shall be evaluated to implement suitable BMPs and removal strategies. Overall, the Contractor shall design the project in such a way as to minimize disturbance of environmental resources: natural sediment, vegetation, and wildlife. These components of natural habitats play a vital ecological function and should remain in place to the greatest extent possible.

1.5 Regulatory Considerations

Various marine debris removal job tasks may be under the authority of (or may encounter conditions under the authority of) the regulatory agencies. Any permits required for a specific debris removal project shall be obtained. The Regulatory Considerations Matrix (Attachment B) summarizes the regulatory agency considerations and recommendations associated with specific job task concerns for marine debris removal projects. The Contractor is responsible for coordinating all work with local, state, and federal agencies, as required. A copy of all permits shall be posted at the worksite location at all times during project activities.

2. General Guidance for Marine Debris Removal BMPs

2.1 Job Planning and Debris Characterization

Marine debris is often related to fishing, trapping, storms and wind events (not associated with a specific event or response effort), construction/demolition, and improper disposal and/or intentional dumping. Debris may consist of ropes, traps, tackle, anchoring devices, vessel components, miscellaneous construction debris, appliances, Styrofoam, plastics, and a wide variety of consumer debris items. The removal of microplastics is not included in this guidance document.

Site-specific factors should be addressed as early as possible during the planning process to identify environmental concerns and regulatory requirements and to provide adequate time to consult applicable resources and pinpoint a strategy to minimize impacts. Prior to debris removal operations, conduct a site visit and/or review the site location using desktop resources to become familiar with site constraints. Keep the entire removal team informed on the environmental considerations and planned mitigation strategies. The area of potential impacts should be recorded via photo/video to document pre-work, mid-work and post-work conditions. Teams conducting removal activities should reference and utilize the attached GIS layer links in Attachment A or visit the Marine Debris Removal Resource Map to better understand existing conditions/habitats and plan for removal techniques and access.

Derelict crab traps removed from the waterway (Source: FWC)

Prior to the removal of submerged debris, conduct desktop and minimally invasive reviews of the marine debris location and salvage state to understand existing conditions and potential environmental impacts or hazards. Minimally invasive (e.g., aerial drone) survey methods are preferred over the use of equipment (e.g., vehicles) that may disturb the ground or bottom within a sensitive habitat. Due to the sensitive nature of marine habitats and concerns regarding causing additional environmental harm during debris removal projects that require land access, debris removal may require special approval from resource agencies or landowners providing oversight guidance for any teams conducting removal operations.

It is important to note that every derelict vessel must undergo a legal process prior to removal and shall not be removed unless specifically directed by the Florida Fish and Wildlife Conservation Commission (FWC) or other marine law enforcement agency. Documents must be provided to the Contractor authorizing vessel removal, including directions regarding storage or disposal of the vessel.

2.1.1 Exceptions for Removal and Required Reporting

Man-made debris items may be encountered that may be considered an exception for removal. Such debris may include man-made items that would cause substantial damage to natural resources during removal activities, derelict vessels (that do not have removal authorization), and cultural artifacts. Specific reporting contacts for these and other items, including derelict fishing gear, potentially hazardous materials, and marine mammals, are provided in the Regulatory Considerations Matrix (Attachment B) and within the sensitive habitat BMPs provided in Section 3.

2.1.2 Environmental Response Management Application (ERMA)

The National Oceanographic and Atmospheric Administration's ERMA website provides GIS data layers that may prove useful for project planning. Users can reference the ERMA layers for information on Bathymetry & Hydrology; Navigation & Marine Infrastructure; and Weather, Oceanography, & Natural Hazards within a debris removal project area.

Link: Environmental Response Management Application (ERMA) | response.restoration.noaa.gov

2.2 Consideration of Marine Debris Colonization by Marine Species

2.2.1 Marine Debris Colonized by Corals

Although marine debris is generally considered pollution, submerged debris may promote marine life by providing stable structure and surface area for colonization by reef organisms. Over time, colonized debris can create underwater habitat that mimics some characteristics of natural reefs. However, the benefits of such artificial substrates can be complicated by factors such as the type of material, structural integrity, and obstruction to navigation. Such factors should be strategically evaluated prior to deciding whether to leave marine debris in place as suitable marine habitat. If submerged debris targeted for removal appears to be inhabited by stony corals and/or soft corals, document/photograph the species found and its location, and consult with FWC and the Florida Department of Environmental Protection (FDEP) for guidance on how to proceed.

Abandoned concrete slabs creating fish habitat and structure for stony coral growth in South Florida (Source: AtkinsRéalis)

2.2.2 Marine Debris Colonized by Invasive Marine Species

Invasive species are plants or animals that are not native to Florida that were introduced to Florida waters through human activities. Invasive species can displace native species and disrupt natural communities. There are two invasive species that have been documented on marine debris in Florida and are of particular concern for removal operations:

Asian green mussel (*Perna viridis*)

- Found throughout Florida waters
- Settles on hard substrate (surfaces)
- Can form large masses on submerged debris

Orange cup coral (*Tubastraea sp.*)

- Found throughout the tropical western Atlantic, including southeast Florida and the Gulf of Mexico.
- Settles on hard substrate (surfaces), with a preference for darkened crevices and artificial structures.

Orange cup coral, invasive to Florida (Source: G.P. Schmahl/Flower Garden Banks National Marine Sanctuary)

Further spread of the Asian green mussel or orange cup coral should be prevented. When these organisms are seen attached to submerged debris targeted for removal:

- Avoid incidental removal or fragmentation of the invasive species into the water. If necessary, remove the attached organism on dry land. Request guidance for recommended proper disposal.
- Document and report sightings of these species to:
  - The FDEP Southeast Florida Action Network (SEAFAN) Online or call 866-770-7335.
  - The University of Georgia's Center for Invasive Species and Ecosystem Health (in partnership with FWC) through the website IveGot1.org or the phone hotline 888-Ive-Got1 (888-483-4681).

2.3 Universal Marine Debris Removal BMPs

The objective of debris removal BMPs is to avoid and minimize disturbance to sensitive habitats and species. Consider the following BMPs during all debris removal activities:

- Contractor shall use established pre-existing access/egress routes where feasible (e.g., roads, paths, trails, or waterways). If pre-existing access/egress routes do not exist, it may be necessary to establish temporary access/egress corridors to minimize environmental and traffic impacts.
- Contractor shall locate and establish staging areas during the planning process and prioritize disturbed areas (e.g., pavement, bulkheads) for staging.
- Contractor shall locate suitable anchoring area(s) during the planning process and prioritize bare sand or mud bottom for anchoring.
- Contractor shall conduct debris removal during high tide.
- Contractor shall document site conditions (photos/videos) prior to conducting work to record pre-work conditions, during removal work, and after completion of removal work to record post-operations conditions. A daily written report should be prepared and maintained for all removal activities.
- Contractor shall conduct all removal operations during daylight hours. Consider rescheduling operations when weather conditions (e.g., fog, rain, wind) reduce ability to detect sensitive habitats and wildlife.
- Special care is needed where there is evidence that the debris is weakened and could fragment/disintegrate during removal. Work crews should use hand tools to remove any smaller associated debris materials.
- Contractor shall remove all equipment and materials deployed to facilitate debris removal operations as soon as possible or at conclusion of operations.
- Contractor shall avoid disturbing local wildlife: watch for and avoid wildlife collisions while operating vehicles, maintain the appropriate distance from any observed animals, and avoid areas of wildlife aggregation/nesting. The Contractor shall be familiar with protected species (see Section 4).
- Contractor shall avoid operating machinery and vessels in and over sensitive habitats to the greatest extent feasible.

2.3.1 Vessel for Transport of Debris

- Contractor shall prioritize the use of shallow draft vessels and consider using air boats without propellers to minimize impacts to shallow habitats.
- Inflatable boats have proven to be extremely efficient for work in coral reef environments based on their ability to operate in shallow waters and their high carrying capacity and stability when hauling heavy debris. They can also be deployed from larger vessels

stationed in deeper water or from low-pressure vehicles stationed in wetlands.

- The Contractor shall avoid blocking major egress points in channels, river, passes, and bays with work vessels or equipment.
- The Contractor shall keep a minimum of one foot of clearance above the submerged bottom substrate at all times.
- The Contractor shall be aware of the tide schedules throughout operations, along with the draft of the work vessel and the waterway depths at and around the project site.

2.3.2 Activities to Avoid

- The Contractor shall avoid deployment of anchored items that do not employ stiff, taut, and non-looping anchor lines.
- The Contractor shall avoid dragging derelict vessels, debris, or other items over natural habitats. Items should be hoisted or re-floated if possible.
- The Contractor shall avoid having excess line (e.g., towing or anchoring) within the water column or on the bottom substrate.

2.3.3 Notifying Debris Owner / Landowner / Regulatory Agencies Regarding Access and Debris Removal

- The Contractor shall record the following information regarding the debris to be removed: latitude/longitude, distance to shore, and site conditions including depth, current, visibility, and a general geographic description.
- The Contractor shall obtain the name, address, and contact information for the debris and/or landowner(s) and any relevant operators.
- The Contractor shall consult with landowners at the onset of an intertidal debris removal project, both to gain access to privately owned intertidal land for debris removal and, if necessary, to develop project-specific techniques or modifications to the BMPs presented here.
- The Contractor may review the County property appraiser websites to help determine those landowners requiring notification for access and removal.

2.3.3.1 Derelict Vessels

- No vessel shall be removed without authorization from a law enforcement officer or agency, pursuant to §823.11, F.S.
- The Contractor shall consult with local law enforcement, the U.S. Coast Guard (USCG) and/or the Florida Department of Motor Vehicles (DMV) which may possess detailed information on the vessel and owner/operator.

2.3.4 Pollution Control

- The Contractor shall remove all contaminants and pollutants from the site, including fuels, batteries, paints, solvents, and engines prior to extraction.
- Any contaminant or pollutant found to be associated with the debris shall be removed by the Contractor, placed in an approved container, and properly disposed.
- If the debris contains free floating product (e.g., gas/oil), the Contractor shall place an absorbent blanket on the water's surface within the turbidity barrier.
- The use of detergents (e.g., dish soap, degreaser, oil dispersion chemicals) is prohibited.
- The Contractor shall perform on-water demolition of a floating vessel in a manner where that debris stays contained on, or within, the hull of the vessel. Removal of the intact vessel is preferred in which case the Contractor shall perform the demolition of the vessel on a barge or on land where adequate surface space is available to avoid the reintroduction of debris into the water.
- In the event of oil or chemical release to the water column, the Contractor shall immediately contact the appropriate authorities:
  - National Response Center hotline: 800-424-8802
  - State Watch Office: 800-320-0519

2.3.5 Turbidity Curtains

- If sediment disturbance is unavoidable during debris removal activities, the Contractor shall employ floating turbidity barriers, staked hay bales, staked filter cloth, sodding, silt fence, or other appropriate erosion, sedimentation, and turbidity control measures prior to initiating removal.
- The Contractor shall monitor and control turbidity during operations.
- In cases where turbidity curtains are utilized, the Contractor shall install turbidity curtains as described below, prior to initiating any project activities:
  - Install floating turbidity barriers with weighted skirts that extend to within one foot of the bottom around all work areas that are in, or adjacent to, surface waters.
  - Install a turbidity barrier with a 10-foot radius of the debris before starting any

Turbidity curtains deployed for sedimentation containment during marine debris removal in Levy County, Florida (Source: Avery Bristol, FWC)

removal activities.

- Maintain the turbidity barriers throughout construction to control erosion and siltation and ensure that turbidity levels within the project area do not exceed background conditions (i.e., the normal water quality levels from natural turbidity).
- Install turbidity curtains and other in-water equipment in a manner that does not entrap wildlife within the construction area, block access for wildlife to navigate around the construction area, or block wildlife entry to, or exit from, designated critical habitat.
- Monitor and maintain turbidity barriers in place until the authorized work has been completed and the water quality in the project area has returned to background conditions.
- In the habitat range of Endangered Species Act (ESA) listed corals (St. Lucie Inlet, Martin County south to the Dry Tortugas and the U.S. Caribbean): all turbidity controls identified above shall be followed, except that turbidity barriers should be secured to the seafloor. The secured turbidity curtains must avoid contact with all corals or seagrasses, if feasible.

2.3.6 Disposal and Recycling

Pre-existing state and local requirements for debris and waste handling, landfills, and recycling differ widely throughout the state of Florida. Many state or local governments have pre-existing guidelines for staging and waste disposal in state and local emergency management plans which may be valuable resources for debris removal project planning. If debris is suspected/known to contain hazardous materials, specific advance planning for disposal and recycling of these items is required.

Barge-mounted excavator used to deposit debris directly into waste receptacle.(Source: FWC)

Section 5 addresses BMPs for specific debris removal techniques. Debris removal techniques are presented in order of preference, from the most preferable technique (manual removal) to the least preferable technique (dredging/excavating/filling).

3. BMPs for Removal of Debris found within Sensitive Habitats

This section of the document provides BMPs for conducting debris removal activities within sensitive habitats. Job Aids are provided in Attachment C, which summarize the BMPs within each of the sensitive habitat types addressed below (i.e., Beaches, Dunes, and Hammocks; Mangroves, Salt Marshes, and Tidal Flats; and Submerged Marine Habitats).

3.1 BMPs for Debris found within Beaches, Dunes, and Hammocks

A beach is generally defined as a stretch of sand or smaller loose particles (e.g., pebbles, shells, gravel) that exist between the water and the land. A beach dune is an accumulation/ ridge of wind-blown sand just landward of the beach that is often colonized by grasses and vines. A hammock refers to a group of hardwood trees that are growing in an elevated area adjacent to wetlands. The FDEP's Beaches Programs have regulatory jurisdiction over Florida's coastal systems.

Consider the following BMPs when conducting debris removal activities within beach, dune, and hammock communities:

- Use only beach access points to minimize impacts.
- When operating wheeled vehicles on beach habitats, Contractor shall use low-pressure tires [< 10 pounds per square inch (psi)] to minimize impact.
- When operating wheeled vehicles on beach habitats, Contractor shall avoid all dunes and similar features where possible.
- If it is necessary to excavate beach sand, Contractor shall return the beach to its original profile at the end of each day.
- Beach removal activities shall only occur after a Marine Turtle Permit Holder authorized by FWC has surveyed the beach for sea turtle nests.
- Equipment must maintain a distance of at least 10 feet from salt-tolerant vegetation.

Vessel remnants partially buried on the beach in MacArthur State Park, Florida (Source: FDEP and AtkinsRéalis)

Removal operations on sand beaches may require specific restrictions on timing and location to avoid impacts to high-profile or particularly sensitive species such as beach nesting birds, sea turtles, and beach mice. Specific guidance regarding timing and location of removal activities may be required to minimize disturbance to human uses of un-vegetated shorelines, particularly high-use or amenity beaches and shorelines.

3.2 BMPs for Debris found within Mangroves, Salt Marshes, and Tidal Flats

Mangroves are saltwater-tolerant, woodland trees that occur in tidal estuaries and low-energy coastal areas. Florida's mangroves are typically found south of Cedar Key (Levy County) on the Gulf Coast and south of St. Augustine (St. Johns County) on the Atlantic Coast. Salt marshes, found in the intertidal zone of estuaries, bays, and other low-energy coastal environments, are dominated by salt-tolerant grasses. Tidal flats are areas of soft sediment that generally lack vegetation and are exposed only during low tidal stages. They can be located within estuaries and often occur near inlets, where tidal influence is strongest. Each of these coastal wetlands provides valuable ecological services to coastal ecosystems in Florida.

Consider the following best practices when conducting debris removal within mangroves, salt marshes and tidal flats:

- Access from adjacent water or upland areas for debris removal is generally preferred to direct access of intertidal areas by personnel or equipment.
- Contractor shall generally avoid alteration or trimming of mangroves. Any incidental trimming/alteration of mangroves must be authorized by the FDEP and supervised or conducted by a professional mangrove trimmer.
- Contractor shall remove only vegetation debris within navigable waters that poses a public health and safety concern. Do not remove vegetation from natural mangrove areas/shorelines.
- Contractor shall avoid all unnecessary contact with wetland vegetation or soils when accessing a debris removal site (from vehicles or on foot). Depending on wetland type, season, and wetland soil condition, foot access to the stranded debris in wetland interiors

Derelict vessel debris located in coastal marsh and intertidal mangrove habitats (Source: AtkinsRéalis)

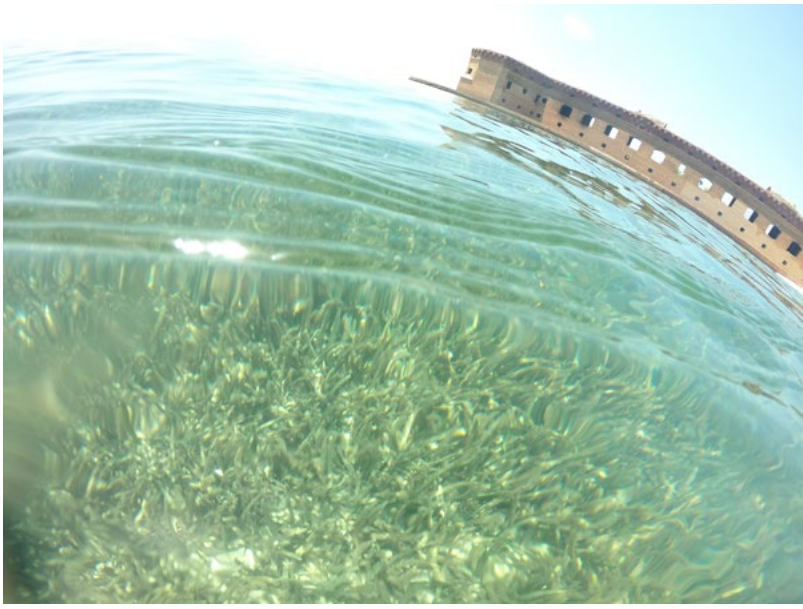
may require the use of boardwalks, walking boards, or mats composed of plywood, fiberglass grating, or other specifically approved materials to minimize damage to the wetland. When possible, staging areas for sorting or storing recovered debris should not be located within wetlands or intertidal areas.

3.3 BMPs for Debris found within Submerged Marine Habitats

Submerged marine habitats in Florida include coral reefs, seagrasses/submerged aquatic vegetation (SAV), oyster beds, live bottom and hard bottom, and mud/silt/sand/gravel substrates. These submerged habitat types support a large variety of organisms and provide valuable coastal protection. These habitats are regulated by FDEP and FWC.

Consider the following BMPs when conducting debris removal within submerged marine habitats:

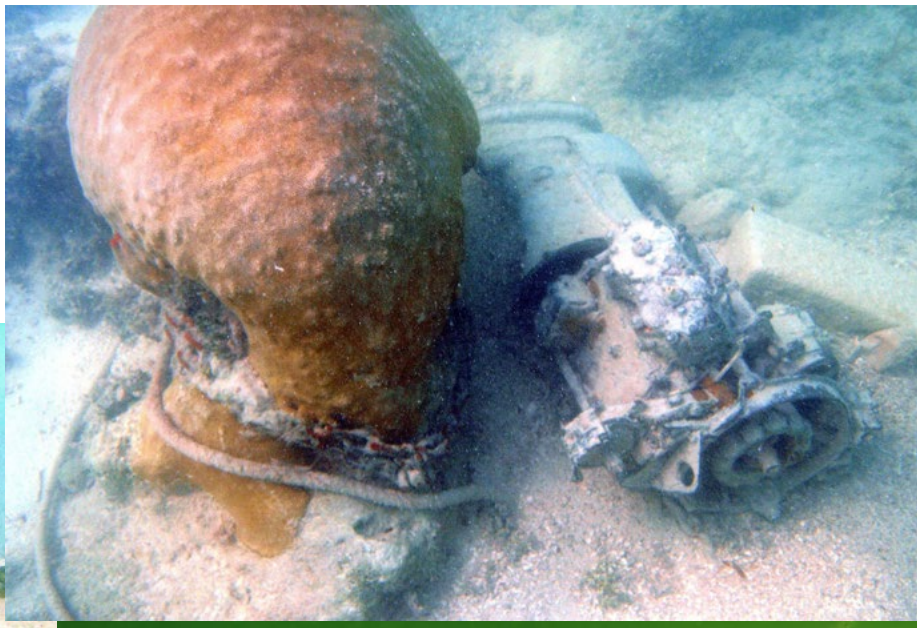
- Contractor shall minimize damage to the seabed and associated organisms to the fullest extent possible. Any damage that does occur during operations shall be recorded and reported.
- Contractor shall designate access routes, staging areas, and prioritize land-side access from disturbed areas (e.g., roads, bulkheads). If not feasible, consider marking, with buoys, sensitive (e.g., seagrass, hard bottom) areas to avoid. Ensure access and removal pathways are the shortest extent possible while avoiding sensitive habitats.
- Contractor shall conduct removal of debris during high tide.

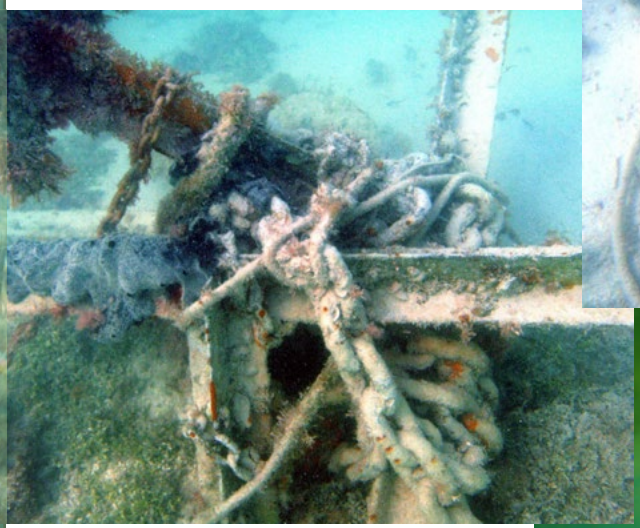


Seagrass seen from above the sea surface in Dry Tortugas National Park, Florida (Source: Alicia Wellman, FWC)

- Contractor shall maintain a minimum draft clearance of one foot and prioritize the use of shallow draft vessels.
- Contractor shall avoid motor operation within tidal flats.
- Contractor shall avoid impacts to seagrasses.
- Contractor shall avoid impacts to coral species. For example: elkhorn coral, staghorn coral, boulder star coral, lobed star coral, mountainous star coral, pillar coral, and rough cactus coral.

- Contractor shall operate motors in a manner that will prevent sediment plumes and prop scarring (e.g., cast no wake, lift propeller in sensitive/shallow areas).
- Contractor shall anchor in bare sand or mud bottom (i.e., unconsolidated sediment) or utilize floating lines (moor or stable structure) for anchoring.
- Contractor shall use floating lines and avoid excess line within the water column during vessel operations (towing, anchoring, etc.) to prevent line contacting submerged resources.
- Contractor shall not drag debris along the seabed by utilizing floating methods.
- Contractor shall avoid excessive sedimentation and utilize slow and steady lifting techniques during debris removal.
- Contractor shall deploy turbidity curtains when necessary. Additional information on turbidity curtains is provided in Section 5.1.5.





Heavy marine debris used as vessel moorings in Key West, FL (Source: Monroe County Marine Resources)

4. BMPs for Protected Species and Protection of Wildlife

Sea turtles, marine mammals, and certain species of fish and birds are provided protections by the Federal and State governments and are regulated by the U.S. Fish and Wildlife Service (USFWS), the National Marine Fisheries Service, FDEP, and FWC. Furthermore, all debris removal projects should be conducted to minimize impacts to wildlife.

Consider the following general BMPs for marine wildlife protection when conducting in-water work:

- Contractor shall watch for and avoid disturbance to listed species protected under the ESA and the Marine Mammal Protection Act (MMPA).
- Contractor shall ensure that all in-water equipment is properly secured with materials/methods that reduce the risk of entanglement of marine species. Use material that does not readily loop and tangle (e.g., metal chains, heavy cables), or enclose flexible in-water lines (e.g., nylon rope) in a plastic or rubber sleeve/tube to add rigidity. No excess line shall be allowed.
- Contractor shall cease operating mechanical construction equipment, including vessels, immediately if a protected or ESA-listed species is observed within a 50-foot radius of construction equipment. Activities cannot resume until after the species has departed the area of its own volition or 30 minutes has elapsed without seeing it within 50 feet.
- If the visual detection of species is not possible during certain weather conditions (e.g., fog, rain, wind), then in-water operations shall cease until weather conditions improve and detection is again feasible.
- All vessels shall operate at “Idle Speed/No Wake” where the draft of the vessel provides less than 4-foot clearance from the bottom, and after a protected species has been observed in and departed from the area.
- Contractor shall follow marked channels and/or routes with maximum water depth.
- Contractor shall not herd or harass a protected species into leaving the area.
- Contractor shall contact FWC Wildlife Alert to report injured, trapped, entangled, or dead wildlife and violations against Florida’s fish, wildlife, or natural resources. Reports shall be made via:
  - “FWC Wildlife Alert” app
  - Texting 847411 (Tip411) with keyword “FWC” and information about the situation
  - Calling the Wildlife Alert Hotline at 888-404-FWCC (888-404-3922)
  - Cellular phone users can call #FWC or *FWC
  - Submitting a tip at MyFWC.com/WildlifeAlert

4.1 Sea turtles and Smalltooth sawfish

All five of the sea turtle species found in Florida waters (loggerhead sea turtle, green sea turtle, Kemp's Ridley sea turtle, leatherback sea turtle, and hawksbill sea turtle) are listed as Threatened or Endangered and protected under the ESA.

Consider the following BMPs during debris removal activities that include work on beaches and submerged habitats:

- Sea turtles may be present swimming in open water and seagrass areas. Maintain a distance of 150 feet from sea turtles while underway.
- Sea turtle nesting season is March 1 to October 31; however, egg laying and hatching can occur all year in some locations.
- The Contractor shall avoid sea turtle nests during debris removal operations, and Contractor shall maintain a minimum distance of 10 feet from a sea turtle nest. Be aware that not all nests will be marked. If unmarked nests are encountered, notify the FWC Wildlife Alert Hotline.

Leatherback turtle crawl (Source: https://awesomeocean.com)

- Contractor shall be aware of the potential for sea turtle nesting activity on all Atlantic- and Gulf-facing sand beaches throughout Florida, including mixed sand and gravel (shell, coral rubble) beaches.
- Contractor shall conduct all removal operations during daylight hours when working on sea turtle nesting beaches.
- Contractor shall not stage equipment overnight on sea turtle nesting beaches.
- Contractor shall report any sighting of a smalltooth sawfish to 844-SAW-FISH and SAWFISH@MYFWC.COM

4.2 Marine mammals

Consider the following general BMPs during debris removal activities that include in-water work:

- Contractor shall maintain a minimum distance of 300 feet from all marine mammals, including manatees, dolphins, porpoises, and whales (note that there are specific distance requirements for the North Atlantic right whale, described below).
- When a marine mammal is sighted while the vessel is underway, the Contractor shall attempt to remain parallel to the animal's course. The Contractor shall avoid excessive speed or abrupt changes in direction until the animal has left the area.
- Contractor shall reduce speed to 10 knots or less when mother/calf pairs or groups of marine mammals are observed, when safety permits.

4.2.1 Florida manatee

- All work must be in accordance with the USFWS/FWC Standard Manatee Conditions for In-Water Work (2011).
- All personnel shall be instructed about the presence of manatees and manatee speed zones, and the need to avoid collisions with and injury to manatees. Advise all response personnel that there are civil and criminal penalties for harming, harassing, or killing manatees.
- All on-site project personnel are responsible for observing water-related activities for the presence of manatee(s).
- Contractor shall report a distressed or dead manatee to FWC via:
  - "FWC Wildlife Alert" app
  - Texting 847411 (Tip411) with keyword "FWC" and information about the situation
  - Calling the Wildlife Alert Hotline at 888-404-FWCC (888-404-3922)
  - Cellular phone users can call #FWC or *FWC
  - Submitting a tip at MyFWC.com/WildlifeAlert

Manatees at Flamingo Marina, Everglades National Park. (Source: Bonnie Gross, Florida Rambler)

4.2.2 North Atlantic right whale

- Contractor shall maintain a minimum distance of 1,500 feet (500 yards) from a North Atlantic right whale.
- Vessels 65 feet in length or longer must comply with the Right Whale Ship Strike Reduction Rule.
- Contractor shall reduce speeds to 10 knots or less in North Atlantic right whale Seasonal Management Areas.
- Contractor shall check various communication media for general information regarding avoiding ship strikes and specific information regarding right whale sightings in the area. These include National Oceanographic and Atmospheric Administration (NOAA) weather radio, United States Coast Guard (USCG) NAVTEX broadcasts, and Notices to Mariners.
- Contractor shall report injured, dead, or entangled right whales to the USCG via VHF Channel 16.

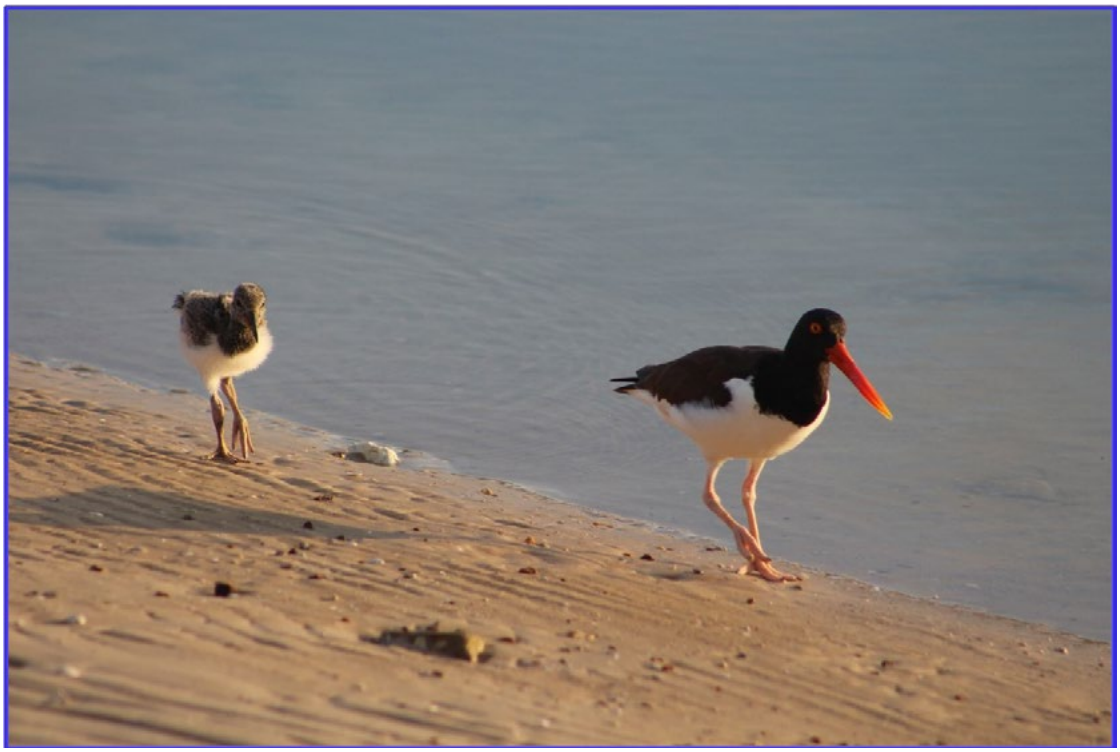
4.3 Birds

Certain species of coastal birds are listed as Threatened and Endangered species under the ESA (e.g., piping plover, red knot, wood stork) or by the state (e.g., American oystercatcher, black skimmer, least tern). Furthermore, certain bird species are federally protected under the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act (BGEPA).

Consider the following BMPs during debris removal activities that include work in coastal habitats:

- Contractor shall avoid known bird nesting and/or aggregation areas. Do not enter sites with nesting birds without resource agency or conservation area landowners present.
- If any of the birds in the area are still nesting (with eggs or young birds at the nest), it is preferable to delay the debris recovery until such time that no birds are nesting, and the young birds have left the area.
- Contractor shall stay off beaches/islands and outside buoy markers during the nesting season timeframe depicted on buoys.
- Contractor shall enforce a 150-foot buffer around islands with nesting activity (e.g., birds in nests, birds flying into the island with nesting material).
- Contractor shall avoid aircraft/drone disturbance to bird nesting and aggregation areas. If roosting or resting birds such as egrets, herons, eagles, or frigatebirds are observed, limit low and repetitive flights to minimize stress to those birds.
- If using airboats, the Contractor shall maintain a distance of 1,000 feet from nesting bird sites to limit disturbance.

- To limit disturbance to birds and other sensitive species associated with wetland and intertidal habitats, work crews should be limited in size and number to the minimum number of personnel and equipment required to complete debris removal in an efficient timeframe. Equipment and personnel should work as closely together as is feasible during debris recovery operations to minimize disturbance.
- Contractor shall check under and around vehicles and heavy equipment parked on the beach before they are moved. Shorebirds (e.g., piping plover and red knot) are especially vulnerable when they are roosting at night, and extra care should be taken at these times.
- Contractor shall avoid deliberately flushing birds (causing them to fly away). Flushing of birds can be considered as a “take” (action directed immediately against a protected species) under federal law.



Juvenile and adult American oystercatcher near shoreline (Source: AtkinsRéalis)

5. BMPs for Specific Debris Removal Techniques

This section presents BMPs related to specific debris removal techniques, including manual removal, lifting, floating, dragging, dredging, excavation, and filling. It should be noted that the debris removal techniques are presented in order of preference, from the most preferable technique (i.e., manual removal - Section 5.1) to the least preferable technique (dredging/ excavating/filling - Section 5.5).

5.1 Manual Removal for Small Debris

Consider the following BMPs during removal of small debris items by hand:

- In-Water – Marine debris removal via divers should be conducted by experienced salvage divers with an understanding of the safety and environmental concerns of removal operations. Foot traffic and contact with the bottom shall be avoided by controlling buoyancy. Manual removal should be prioritized over mechanical removal in-water.
- Land-Based – Manual recovery is preferred if the substrate is firm enough to support foot traffic and debris is small and light enough to be removed by hand or with hand tools. When the substrate is extremely soft, walk boards or mats may be utilized for foot traffic. Debris may be dismantled by hand and removed via a route that is safe and clear of vegetation and sensitive habitats.
- Mechanical Assistance – Manual operations can be employed to assist mechanical operations. For example, in lifting operations, the crane operator should be assisted by an in-water spotter to avoid blind grappling.
- The Contractor shall remove debris fragments created during debris removal activities by hand to the extent possible. Excavator buckets should not be used to remove debris fragments from the bottom substrate.

Manual assistance to derelict vessel removal via floating method (Source: FWC)

Manual removal of a derelict crab trap within intertidal marine habitat (Source: FWC)

5.2 Lifting Techniques (Crane, Hoisting, Aerial Lifting)

Consider the following BMPs during removal of debris items by lifting techniques:

- Where manual recovery is not possible and lifting techniques will be utilized, the Contractor shall employ wheeled or tracked vehicles and equipment to recover debris items in wetland vegetated habitats if access is available and substrate is firm enough to support transit.
- The Contractor shall avoid debris recovery in areas where barges or vessels will ground or strike the bottom, or during times where tidal stages are such that this could occur.
- The Contractor may dismantle/cut debris into more manageable pieces, as needed; however, all dismantling/cutting shall be properly managed to ensure resulting debris is controlled and able to be removed in its entirety.
- When possible, the Contractor shall utilize crane barges or landside cranes to lift debris clear of mangroves and over the adjacent sensitive shallow habitats.
- Blind grappling is not an acceptable removal method for submerged debris.
- Booms with grappling hooks may be employed to lift smaller items out of the water and onto the deck of a small removal vessel. A barge or boat-mounted crane, boom, or backhoe may be used to lift larger items out of the water or from within wetlands immediately adjacent to the waterline.
- During aerial removal operations (e.g., helicopters), the Contractor shall establish and maintain minimum altitude requirements and appropriate flight corridors, where compatible with flight safety requirements, to reduce disturbance to wildlife, particularly sensitive resources such as nesting or roosting bird concentration areas.
- In some cases, removal of debris items of particular concern from the beaches or un-vegetated intertidal habitats may be attempted by helicopter via sling load or grappling systems where no other access options are available.

Barge-mounted excavator performing lifting technique to remove a derelict vessel in Northeast Florida (Source: FWC)

5.3 Floating Techniques (Buoyancy Lift bags, Patching, Pumps)

- The Contractor shall utilize high tidal stages, spuds, pins, lift bags, and floating lines during removal activities to minimize impacts to the bottom substrate.
- The Contractor shall fill inflatable ballasts to the greatest extent feasible to minimize the draft and width of the impacted area along the removal path.

Marine debris removal in the Florida Keys using lift/float bags (Source: FWC)

5.4 Dragging / Towing (Matting, Rolling/Sled, Winching)

- The Contractor shall remove debris through any previously damaged pathways or via the shortest possible route to minimize further damage to habitats.
- Vessels and vehicles/equipment should not enter wetland areas if possible, and towing/dragging should be conducted from adjacent open water or previously disturbed upland areas.
- Sleds can be used to facilitate the transfer of the debris to boats or vehicles positioned adjacent to wetlands in open water or upland areas. Cable yarding or logging applications may also be used in these situations to minimize vegetation/soil disturbance.
- If specialized vehicles or equipment (e.g., amphibious excavator or marsh buggy) will be used to access high priority debris in wetland interiors, the Contractor shall minimize travel to extent possible, avoid reuse of previous tracks to avoid creating ruts or channels, consult with resource experts to determine the best route to minimize environmental impacts, and avoid turning maneuvers in wetland interiors.
- Where appropriate, the Contractor shall place geotextile mats, wooden board, or other similar materials along the extraction route to facilitate the sliding of debris and to spread the load while minimizing damage to vegetation and soils.
- Prior to dragging, the Contractor shall make every attempt to remove debris parts/components that protrude or are likely to snag on vegetation or soils.
- The Contractor shall use caution when using airboats to remove debris by dragging. The propeller slip stream may impact debris and vegetation and disturb wildlife, and the inability to reverse requires careful maneuvering close to shore.

- The Contractor shall not drag debris across tidal marsh, seagrass, mangrove roots, or oysters.
- Towlines should be attached to the stranded debris at the closest/least intrusive point.
- The Contractor may consider carefully towing debris out of the wetlands by boat to the waterline or to an adjacent upland area to then be removed by vehicle.
- The Contractor shall use floating lines in shallow water to minimize impacts to the bottom substrate during towing.

Derelict vessel removal utilizing a combination of methods: towing, float bags, and manual (diver) assistance (Source: FWC)

- The Contractor shall be prepared for engine-powered (fuel use) containment and clean-up when winching is utilized.

5.5 Dredging, Excavation, and Filling

- Dredging, excavation and filling may require permit(s) guidance from the United States Army Corps of Engineers (USACE) and FDEP.
- For excavation work on land, the Contractor shall deposit excavated materials on uplands that are diked or otherwise sloped or designed to prevent discharge into wetlands.

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ATTACHMENT A. GIS LAYERS - MARINE DEBRIS REMOVAL RESOURCE MAP

An interactive map is available on FDEP's website: Marine Debris Removal Resource Map

Map Service Title	Feature Service Resource/Link
Marine Debris	
FWC Derelict Vessel Database	MyFWC.com Derelict Vessel
Property Information / Managed Areas	
Cadastral Property Appraiser Parcels	https://ca.dep.state.fl.us/arcgis/rest/services/Map_Direct/Boundaries/MapServer/16
FL_Conservation_Lands_web	https://services.arcgis.com/9Jk4Zl9KofTtvg3x/ArcGIS/rest/services/FL_Conservation_Lands_web/FeatureServer/8
National Estuarine Research Reserve (NERR) Boundaries	https://ca.dep.state.fl.us/arcgis/rest/services/Map_Direct/Program_Support/MapServer/30
Florida Keys National Marine Sanctuary	https://ca.dep.state.fl.us/arcgis/rest/services/Map_Direct/Program_Support/MapServer/38
Florida Aquatic Preserves	https://ca.dep.state.fl.us/arcgis/rest/services/OpenData/AQUATIC_PRESERVES/MapServer/0
Outstanding Florida Waters	https://ca.dep.state.fl.us/arcgis/rest/services/OpenData/OFW/MapServer/0
Kristin Jacobs Coral Reef Ecosystem Conversation Area	https://ca.dep.state.fl.us/arcgis/rest/services/OpenData/KJ_CORAL_REEF_ECA/MapServer/0
State Park's Boundaries	https://ca.dep.state.fl.us/arcgis/rest/services/OpenData/PARKS_BOUNDARIES/MapServer/0
FWC Critical Wildlife Areas	https://geodata.myfwc.com/datasets/critical-wildlife-areas-florida/explore
NPS - National Register of Historic Places Locations	https://mapservices.nps.gov/arcgis/rest/services/cultural_resources/nrhp_locations/MapServer
Natural Resources, Habitats, and Listed Species	
National Wetlands Inventory - Wetlands (Map Service)	https://fwspublicservices.wim.usgs.gov/wetlandsmapservice/rest/services/Wetlands/MapServer/
Mangrove Habitat in Florida	https://atoll.floridamarine.org/arcgis/rest/services/FWC_GIS/OpenData_MarineEco/MapServer/4
Tidal Flats in Florida	https://atoll.floridamarine.org/arcgis/rest/services/FWC_GIS/OpenData_MarineEco/MapServer/8
Salt Marshes in Florida	https://atoll.floridamarine.org/arcgis/rest/services/FWC_GIS/OpenData_MarineEco/MapServer/3
Seagrass Habitat in Florida	https://atoll.floridamarine.org/arcgis/rest/services/FWC_GIS/OpenData_MarineEco/FeatureServer/6
Coral and Hard Bottom Habitats in Florida	https://atoll.floridamarine.org/arcgis/rest/services/FWC_GIS/OpenData_MarineEco/MapServer/7
Oyster Beds in Florida	https://atoll.floridamarine.org/arcgis/rest/services/FWC_GIS/OpenData_MarineEco/MapServer/5
Essential Fish Habitat - NOAA	https://services2.arcgis.com/FiaPA4ga0iQKduv3/arcgis/rest/services/nationwide_efh_1/FeatureServer
Acropora Critical Habitat - NMFS	https://ca.dep.state.fl.us/arcgis/rest/services/Map_Direct/ESSA_Support/MapServer/5
Acropora Priority Sites	Layer: Acropora Priority Sites (ID: 16) (floridamarine.org)

Map Service Title	Feature Service Resource/Link
Pillar Coral Critical Habitat - NMFS	https://services2.arcgis.com/C8EMgrsFcRFL6LrL/arcgis/rest/services/Proposed_CoralPillar20201127/FeatureServer
Lobed Star Coral Critical Habitat - NMFS	https://services2.arcgis.com/C8EMgrsFcRFL6LrL/arcgis/rest/services/Proposed_CoralLobedStar20201127/FeatureServer
Mountainous Star Coral Critical Habitat - NMFS	https://services2.arcgis.com/C8EMgrsFcRFL6LrL/arcgis/rest/services/Proposed_CoralMountainousStar20201127/FeatureServer
Boulder Star Coral Critical Habitat - NMFS	https://services2.arcgis.com/C8EMgrsFcRFL6LrL/arcgis/rest/services/Proposed_CoralBoulderStar20201127/FeatureServer
Rough Cactus Coral Critical Habitat - NMFS	https://services2.arcgis.com/C8EMgrsFcRFL6LrL/arcgis/rest/services/Proposed_CoralRoughCactus20201127/FeatureServer
American Crocodile Critical Habitat - USFWS	https://ca.dep.state.fl.us/arcgis/rest/services/Map_Direct/ESSA_Support/MapServer/12
Loggerhead Turtle Nearshore Reproductive Critical Habitat - USFWS	https://ca.dep.state.fl.us/arcgis/rest/services/Map_Direct/ESSA_Support/MapServer/14
Gulf Sturgeon Critical Habitat (Line) - NMFS	https://ca.dep.state.fl.us/arcgis/rest/services/Map_Direct/ESSA_Support/MapServer/18
Gulf Sturgeon Critical Habitat (Areas) - NMFS	https://ca.dep.state.fl.us/arcgis/rest/services/Map_Direct/ESSA_Support/MapServer/19
Gulf Sturgeon Migratory Zones - USACE	https://ca.dep.state.fl.us/arcgis/rest/services/Map_Direct/ESSA_Support/MapServer/33
Smalltooth Sawfish Critical Habitat - NMFS	https://ca.dep.state.fl.us/arcgis/rest/services/Map_Direct/ESSA_Support/MapServer/30
Smalltooth Sawfish Exclusion Zones - USACE	https://ca.dep.state.fl.us/arcgis/rest/services/Map_Direct/ESSA_Support/MapServer/11
Choctawhatchee Beach Mouse Critical Habitat - USFWS	https://ca.dep.state.fl.us/arcgis/rest/services/Map_Direct/ESSA_Support/MapServer/8
Perdido Key Beach Mouse Critical Habitat - USFWS	https://ca.dep.state.fl.us/arcgis/rest/services/Map_Direct/ESSA_Support/MapServer/7
St. Andrew Beach Mouse Critical Habitat - USFWS	https://ca.dep.state.fl.us/arcgis/rest/services/Map_Direct/ESSA_Support/MapServer/6
North Atlantic Right Whale Critical Habitat - NMFS	https://ca.dep.state.fl.us/arcgis/rest/services/Map_Direct/ESSA_Support/MapServer/15
Biologically Important Areas for Cetaceans – Small and Resident Population	https://coast.noaa.gov/arcgis/rest/services/Hosted/BiologicallyImportantAreasCetaceansSmallResidentPopulation/FeatureServer/0
State Manatee Protection Zones in Florida	https://atoll.floridamarine.org/arcgis/rest/services/FWC_GIS/OpenData_Boating/MapServer/14
Piping Plover Critical Habitat - USFWS	https://ca.dep.state.fl.us/arcgis/rest/services/Map_Direct/ESSA_Support/MapServer/4
Wading Bird Rookeries	Layer: Wading Bird Rookeries - 1999 (ID: 15) (floridamarine.org)
Florida Shorebird Nesting Database	https://atoll.floridamarine.org/arcgis/rest/services/FWC_GIS/OpenData_FWSppLoc/MapServer/21

ATTACHMENT B. REGULATORY CONSIDERATIONS MATRIX

Obey all local laws, including but not limited to, land access, beach closures, sensitive habitat exclusion areas, wildlife avoidance, and/or waste disposal. Where necessary, obtain and keep any permits or passes on site.

* Disclaimer: This document is not intended to list all potential authorizations required. Note that the regulations of local agencies are not covered in this guide. The contractor shall be responsible for obtaining all necessary authorizations prior to initiating the debris removal project.

Job Task Concern	Regulatory Agency Consideration	Recommendations
Significant disturbance of sediment required to remove debris / vessel	United States Army Corps of Engineers (USACE) Section 404 Clean Water Act and Section 10 Rivers and Harbors Act	A USACE Nationwide Permit may be required for work. Contact 904-232-1177 SAJ-RD@usace.army.mil for more information.
Filling of wetlands or other surface waters or dredging that creates or expands surface waters	Florida Department of Environmental Protection (FDEP) Environmental Resource Permit (ERP)	A FDEP ERP may be required for work. Contact the local FDEP regulatory office for further information (https://floridadep.gov/districts) and USACE at SAJ-RD@usace.army.mil.
Derelict vessel removal	FDEP Exemption under Section 373.406(6), Florida Statutes may be required. Assumes that the extraction of these vessels from the marine environment will cause only minimal environmental impacts and in turn avoid the long-term impacts resulting from the degradation of the vessel at its current location.	Contact the local FDEP regulatory office for further information (https://floridadep.gov/districts). Newly discovered derelict vessels can be reported to the FWC Wildlife Alert Hotline: 888-404-FWCC (3922).
Derelict fishing gear or potentially contaminated materials	Florida Fish and Wildlife Conservation Commission (FWC)	The removal of derelict fishing gear, traps and vessels requires coordination with FWC.
Prehistoric/historic artifacts, such as pottery or ceramics, projectile points, dugout canoes, metal implements, historic building materials, or any other physical remains that could be associated with Native American, early European, or American settlement are encountered.	State Historic Preservation Officer (SHPO) - Section 106 National Historic Preservation Act	Cease all activities involving subsurface disturbance, and immediately contact the Florida Division of Historical Resources at 850-245-6300. Artifacts greater than 50 years old are considered historical. Reference National Register of Historic Places when completing a preliminary desktop review in Environmental Response Management Application (ERMA) and Geographic Information System (GIS) layer links.
Human remains are encountered	Local law enforcement	Cease all activities and immediately contact local law enforcement.

Job Task Concern	Regulatory Agency Consideration	Recommendations
Endangered and threatened species or marine mammals are encountered	FWC	All vessel operators must watch for and avoid collision with species protected under the Endangered Species Act (ESA) and the Marine Mammal Protection Act (MMPA). Report encounters to the FWC Wildlife Alert Hotline: 888-404-FWCC (3922). Refer to Protected Species and Protection of Wildlife BMPs for further actions.
Incidental trimming/alteration of mangroves	FDEP	FDEP authorization required. Activities must be supervised or conducted by a professional mangrove trimmer. Contact the local FDEP regulatory office for further information (https://floridadep.gov/districts).
Seagrass impacts	FDEP and FWC	Contact the local FDEP regulatory office for further information (https://floridadep.gov/districts). "FWC Wildlife Alert" app (download from Google Play or Apple Store) Text 847411 (Tip411) with keyword "FWC" and information about the situation Call the Wildlife Alert Hotline at 888-404-FWCC (888-404-3922) Submit a tip at MyFWC.com/WildlifeAlert
Coral impacts	FDEP and FWC	Contact the local FDEP regulatory office for further information (https://floridadep.gov/districts). FWC Reporting Options: "FWC Wildlife Alert" app Text "TIP411" (847411) with keyword "FWC" and information about the situation. Call the Wildlife Alert Hotline at 888-404-FWCC (888-404-3922). Submit a tip at MyFWC.com/WildlifeAlert
Work within a National Park	National Park Service (NPS)	Reference National Parks when completing a preliminary desktop review with GIS or ERMA layer links.
Work within the Florida Keys National Marine Sanctuary (FKNMS) - (Federal Sanctuary)	Sanctuary Permitting Agency	Reference FKNMS when completing a preliminary desktop review with GIS or ERMA layer links. https://floridakeys.noaa.gov/ FKNMSpermits@noaa.gov

Job Task Concern	Regulatory Agency Consideration	Recommendations
Work within an Aquatic Preserve (43 listed in Florida)	Regulated by FDEP and special protections under Chapter 18-20 F.A.C.	Reference Aquatic Preserves when completing a preliminary desktop review with GIS or ERMA layer links. 253.04(3)(a), F.S. (2009) prohibits seagrass damage within aquatic preserves; carrying a penalty of up to $1,000.
Work within a National Estuarine Research Reserve (NERR)	FDEP	Reference NERR when completing a preliminary desktop review with GIS https://ca.dep.state.fl.us/arcgis/rest/services/Map_Direct/Program_Support/MapServer/30
Work within a National Wildlife Refuge	United States Fish and Wildlife Service (USFWS)	Reference National Wildlife Refuges when completing a preliminary desktop review with GIS or ERMA layer links. nos.info@noaa.gov
Work within a Florida State Park	Florida State Parks	Reference State Parks when completing a preliminary desktop review with GIS or ERMA layer links. Contact (850) 245-2157 or FSP.Feedback@FloridaDEP.gov for more information.
Work within a FWC Critical Wildlife Area (CWA)	FWC	Reference CWA locations when completing a preliminary desktop review with GIS https://geodata.myfwc.com/datasets/critical-wildlife-areas-florida/ explore Observe CWA guidelines, additional info and CWA coordinator contact available at: https://myfwc.com/conservation/terrestrial/cwa/

ATTACHMENT C. CONTRACTOR JOB AIDS

Contractor job aids are intended to be used as tear-away sheets for providing BMPs for debris removal in the following habitats:

- Beaches, Dunes, and Hammocks
- Coastal Wetlands and Intertidal Areas
- Submerged Habitats

BMPs for Debris Removal in Beaches, Dunes, and Hammocks

Pre-Removal Activities

- ☐ Photograph/video site conditions.
- ☐ Plan for work during daylight hours and favorable weather conditions.
- ☐ Survey project vicinity for sensitive environments and endangered species. Removal operations shall not commence on beaches until a Marine Turtle Permit Holder authorized by FWC has surveyed for sea turtle nests.
- ☐ Designate access routes and staging for removal operations:
  - Prioritize land-side access from disturbed areas (e.g., roads, trails, paved parking).
  - Ensure access and removal pathways are the shortest extent possible while avoiding sensitive habitats.
  - Consider environmental trade-offs between dragging multiple items along the same path versus dragging items via different paths. If each item to be removed via dragging is likely to cause significant impact to vegetation and soils, consider re-using paths with follow-up repair/restoration. If individual items are likely to cause more limited impacts, it may be more appropriate to drag individual items via separate paths.
  - Inform entire removal team of planned routes and sensitive areas to avoid.
- ☐ Identify removal operation technique and procedure (e.g., towing/dragging and minor deconstruction of debris or pollution control required at the removal site).

Removal Operations

- ☐ Manual removal techniques are preferred where possible.
- ☐ Where manual recovery is not possible, the next preferred method is recovery via equipment-assisted lifting methods.
- ☐ The least preferred method is removal via dragging/towing. If necessary, utilize geotextile or wooden mats, rollers, etc. along the extraction route to facilitate the sliding/rolling and load spreading of debris along the substrate/vegetation. This equipment may also be utilized to minimize soil/vegetation disturbance (e.g., rutting) by vehicles.
- ☐ Consider dismantling/cutting large and difficult to handle debris into more manageable pieces.
- ☐ When there is evidence that the debris is weakened and could fragment/disintegrate during removal, use hand tools to remove any smaller associated debris materials.
- ☐ Utilize low-pressure tires (< 10 psi).
- ☐ Avoid dunes and similar features where possible.
- ☐ If excavation is necessary, return the beach to its original profile at the end of each day.
- ☐ Maintain a minimum distance of 10 feet from vegetation while operating/staging equipment.
- ☐ Avoid disturbing local wildlife: watch for and maintain a distance from any observed animals: avoid areas of wildlife aggregation/nesting. Removal operations on sand beaches may require specific restrictions on timing and location to avoid impacts to high-profile or particularly sensitive species such as beach nesting birds, sea turtle nesting areas, and beach mice.
- ☐ Photograph/video during removal and post-removal.

Final Site Inspection/Cleanup

- ☐ Remove all equipment and materials deployed to facilitate debris removal operations as soon as possible or at conclusion of operations.
- ☐ Remove all debris items or document/photograph the location type of any debris remaining.
- ☐ Document removal details and disposal or recycling methods.

BMPs for Debris Removal in Coastal Wetlands and Intertidal Areas

Pre-Removal Activities

- ☐ Photograph/video site conditions.
- ☐ Plan for work during daylight hours and favorable weather conditions.
- ☐ Survey project vicinity for sensitive environments and endangered species.
- ☐ Designate access routes and staging for removal operations:
  - Avoid sensitive habitats – staged vehicle/vessel should not enter wetlands area if feasible.
  - Prioritize land-side access and staging from disturbed areas (e.g., roads, trails, bulkheads).
  - Ensure access and removal pathways are the shortest extent possible while avoiding sensitive habitats, or through the damaged entry pathway.
  - Inform entire removal team of planned routes and sensitive areas to avoid.
- ☐ Identify removal operation technique and procedure (e.g., towing/dragging and minor deconstruction of vessel or pollution control required at the removal site).

Operations within Wetlands

- ☐ Avoid alteration or trimming of mangroves. Any incidental trimming/alteration of mangroves must be authorized by the FDEP and supervised or conducted by a professional mangrove trimmer.
- ☐ Avoid all unnecessary contact with wetland vegetation or soils on foot or by vehicles.
- ☐ Utilize manual methods for removal and assistance to mechanical operations.
- ☐ Avoid dragging debris along the substrate/vegetation – utilize crane barges, landside cranes, etc. to lift debris clear of sensitive habitats.
- ☐ If dragging/towing through the wetland is required, utilize flotation devices, mats, rollers, etc. along the extraction route to facilitate the sliding/rolling and load spreading.
- ☐ Consider dismantling/cutting large and difficult to handle debris into more manageable pieces.
- ☐ Avoid disturbing local wildlife: watch for and maintain a distance from any observed animals: avoid areas of wildlife aggregation/nesting.
- ☐ Photograph/video during removal and post-removal.

Operations within Shallow Water

- ☐ In intertidal areas, determine if removal is best performed during high tide or during exposure.
- ☐ Avoid/minimize interaction with the seabed and living resources of the bottom:
  - Conduct operations at high tide.
  - Prioritize the use of shallow draft vessels – maintain a minimum draft clearance of 1 foot from the bottom.
  - Operate motors in a manner that will not create sediment plumes or prop scaring.
- ☐ Anchor in bare sand or mud bottom and avoid excess line within the water column.
- ☐ Reduce the risk of wildlife entanglement – in-water lines must be stiff, taught, and non-looping. Do without excess line.
- ☐ Avoid excessive sedimentation – be slow and steady and deploy turbidity curtains when necessary.
- ☐ Remove excess parts/debris (via manual removal) that protrude or are likely to fall off or cause additional damage.
- ☐ Do not drag vessels or debris across tidal marsh, seagrass, or oysters.
- ☐ Photograph/video during removal and post-removal.

Final Site Inspection/Cleanup

- ☐ Remove all debris items or document/photograph the location and type of any debris remaining.
- ☐ Remove all equipment and materials deployed to facilitate debris removal operations as soon as possible or at conclusion of operations.
- ☐ Document removal details and disposal or recycling methods.

BMPs for Debris Removal in Submerged Habitats

Pre-Removal Activities

- ☐ Photograph/video site conditions.
- ☐ Plan for work during daylight hours and favorable weather conditions.
- ☐ Survey project vicinity for sensitive environments and endangered species.
- ☐ Designate access routes and staging for removal operations:
  - Prioritize land-side access and staging from disturbed areas (e.g., roads, trails, bulkheads). If not feasible, consider marking, with buoys or stakes, deeper water access corridors and sensitive (e.g., seagrass, hard bottom) areas to avoid.
  - Ensure access and removal pathways are the shortest extent possible while avoiding sensitive habitats, or through the damaged entry pathway.
  - Inform entire removal team of planned routes and sensitive areas to avoid.
- ☐ Identify removal operation technique and procedure (e.g., towing/dragging and minor deconstruction of vessel or pollution control required at the removal site).

In-Water Operations

- ☐ Avoid/minimize interaction with the seabed and living resources of the bottom:
  - Conduct operations at high tide.
  - Prioritize the use of shallow draft vessels – maintain a minimum draft clearance of 1 foot from the bottom.
  - Operate motors in a manner that will not create sediment plumes or prop scaring.
- ☐ Anchor in bare sand or mud bottom and avoid excess line within the water column.
- ☐ Avoid disturbing local wildlife: watch for and maintain a distance from any observed animals: avoid areas of wildlife aggregation/nesting.
- ☐ Reduce the risk of wildlife entanglement – in-water lines must be stiff, taught, and non-looping. Do without excess line.

Removal Operations

- ☐ Utilize manual methods for removal and assistance to mechanical operations, avoiding diver contact with the bottom by controlling buoyancy.
- ☐ Remove excess parts/debris (via manual removal) that protrude or are likely to fall off or cause additional damage.
- ☐ Avoid dragging debris along the bottom - utilize floating/lifting methods.
- ☐ Utilize crane barges, landside cranes, etc. to lift debris clear of sensitive habitats.
- ☐ If winching is necessary, utilize floating lines to pull the debris in a controlled manner.
- ☐ If dragging is necessary, utilize flotation/buoyancy equipment to reduce debris contact with the bottom and/or place mats/rollers to facilitate sliding/rolling and load spreading along the bottom.
- ☐ Avoid excessive sedimentation – be slow and steady and deploy turbidity curtains when necessary.
- ☐ Photograph/video during removal and post-removal.

Final Site Inspection/Cleanup

- ☐ Remove all debris items or document/photograph the location and type of any debris remaining.
- ☐ Remove all equipment and materials deployed to facilitate debris removal operations as soon as possible or at conclusion of operations.
- ☐ Document removal details and disposal or recycling methods.