



UNITED STATES DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

NATIONAL MARINE FISHERIES SERVICE

Southeast Regional Office

263 13th Avenue South

St. Petersburg, Florida 33701-5505

<http://sero.nmfs.noaa.gov>

October 16, 2015

F/SER47:KG/pw

Colonel Jason A. Kirk, Commander
U.S. Army Corps of Engineers, Jacksonville District
Miami Permits Section
9900 Southwest 107th Avenue, Suite 203
Miami, Florida 33176

Attention: Maria Bezanilla

Dear Colonel Kirk:

NOAA's National Marine Fisheries Service (NMFS) reviewed public notice SAJ-2015-00467 (SP-MIB) dated September 10, 2015. Marathon Hospitality, LLC, requests authorization from the Department of the Army to perform the following activities:

- 1) Place 90 cubic yards of fill to repair and replace 1,163 square feet of concrete dock, riprap revetment, and seawall and to abandon the existing boat ramp;
- 2) Excavate five cubic yards of riprap boulders and place fill within an area that measures 70 square feet located east of the existing boat ramp;
- 3) Place five cubic yards of fill within an area that measures 80 square feet for the installation of a riprap revetment that measures 40 linear feet; and
- 4) Install manatee grates at the existing culverts.

The initial determination by the Jacksonville District is the proposed impacts to 1,452 square centimeters of coral, designated a Habitat Area of Particular Concern (HAPC) by the South Atlantic Fishery Management Council (SAFMC), would not have a substantial adverse impact on essential fish habitat (EFH) or federally managed fishery species. As the nation's Federal trustee for the conservation and management of marine, estuarine, and anadromous fishery resources, the NMFS offers the following comments and recommendations pursuant to authorities of the Fish and Wildlife Coordination Act and the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act).

Essential Fish Habitat within the Project Area

The public notice indicates the project area consists of 0.03 acres of estuarine bottom with substrates suitable for coral within the basin and seagrass along the shoreline adjacent to the basin. A benthic survey was performed on July 7, 2015, by the applicant's consultant. The report describes hardbottom within the basin and corals on riprap. Lesser starlet coral (*Siderastrea radians*) was found in numerous locations within (85 colonies) and adjacent (31 colonies) to the proposed work area. Coral cover within the project footprint was 1,452 square centimeters, and the cover within 10 feet of the proposed project footprint was 860 square centimeters. A total of 2,312 square centimeters of coral could be affected by the project. Turtle grass (*Thalassia testudinum*) is also present in areas adjacent to the project area.

The South Atlantic Fishery Management Council (SAFMC) identifies estuarine bottom, coral, and seagrass habitats as EFH for several species, including adult white grunt (*Haemulon plumieri*); juvenile and adult gray snapper (*Lutjanus griseus*); juvenile mutton snapper (*Lutjanus analis*); and larval and juvenile pink shrimp (*Farfantepenaeus duorarum*). In addition, the SAFMC identifies corals and hardbottom habitat as EFH for lane snapper (*Lutjanus synagris*), schoolmaster (*Lutjanus apodus*), and dog snapper (*Lutjanus jocu*). Hardbottom is also EFH for coral and spiny lobster (*Panulirus argus*). The



SAFMC also designates coral and seagrass as a Habitat Area of Particular Concern (HAPC) for several species within the snapper/grouper complex. HAPC's are subsets of EFH that are rare, particularly susceptible to human-induced degradation, especially important ecologically, or located in an environmentally stressed area. Seagrass directly benefit fishery resources of the Florida Bay by providing water quality benefits, foraging opportunities, and nursery habitat. Further, seagrass and coral are part of a habitat complex that includes mangroves and hardbottom. This complex supports a diverse community of fish and invertebrates within Florida Bay. SAFMC provides additional information on EFH and HAPCs and how they support federally managed fishery species in *Fishery Ecosystem Plan of the South Atlantic Region* (available at www.safmc.net).

Impacts to Essential Fish Habitat and Recommended Avoidance and Minimization

The public notice indicates the project would impact 0.03 acres of estuarine bottom, including coral and hardbottom. The NMFS believes the project can minimize impacts to corals by relocating colonies from the proposed impact area to locations outside of the construction and buffer areas. The public notice states mitigation through the Keys Restoration Fund would be pursued if mitigation proves necessary.

EFH Conservation Recommendations

Section 305(b)(4)(A) of the Magnuson-Stevens Act requires NMFS to provide EFH Conservation Recommendations for any federal action or permit which may result in adverse impacts to EFH. Therefore, NMFS recommends the following to ensure the conservation of EFH and associated fishery resources:

1. The permit require use of the Florida Fish and Wildlife Conservation Commission coral health relocation protocols (enclosed) to determine if individual octocoral colonies are candidates for relocation.
2. The performance standard for coral relocation should be 85 percent survival with positive tissue growth and secure substrate attachment two years after relocation. The number of corals monitored should be no less than 25 percent of the relocated corals and include at least ten colonies of each species. If less than ten colonies of a species are relocated, all of the corals of that species should be monitored.
3. Once avoidance and minimization of project impacts are finalized, the applicant should submit functional assessments quantifying lost environmental functions resulting from the project and a complete mitigation plan demonstrating how the environmental functions lost from coral impacts will be fully offset.
4. Best management practices should be incorporated into the project design to minimize indirect impacts and water quality degradation. These best management practices should include use of staked turbidity curtains around the project area.

Section 305(b)(4)(B) of the Magnuson-Stevens Act and implementing regulation at 50 CFR Section 600.920(k) require the Jacksonville District to provide a written response to this letter within 30 days of its receipt. If it is not possible to provide a substantive response within 30 days, in accordance with the "findings" with the Jacksonville District, an interim response should be provided to the NMFS. A detailed response then must be provided prior to final approval of the action. The detailed response must include a description of measures proposed by the Jacksonville District to avoid, mitigate, or offset the adverse impacts of the activity. If the response is inconsistent with the EFH conservation recommendations, the Jacksonville District must provide a substantive discussion justifying the reasons for not following the recommendations.

Thank you for the opportunity to provide comments. Related correspondence should be directed to the attention of Mr. Kurtis Gregg at our West Palm Beach office, 400 North Congress Avenue, Suite 110, West Palm Beach, Florida, 33401. He may be reached by telephone at (561) 249-1627, or by e-mail at Kurtis.Gregg@noaa.gov.

Sincerely,



/ for

Virginia M. Fay
Assistant Regional Administrator
Habitat Conservation Division

Enclosure: Florida Fish and Wildlife Conservation Commission (FWC) Coral and Octocoral Mitigation Relocation Recommendations (10/7/2015)

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Florida Fish and Wildlife Conservation Commission (FWC) Coral and Octocoral Mitigation Relocation Recommendations

FWC Authorization Required

A Stock Collection and Release, Special Activity License (SAL) is required for all marine species relocation activities statewide, including but not limited to mitigation relocation activities. Information on the SAL Program and applications are available here: <http://myfwc.com/license/saltwater/special-activities/>

Definitions

For purposes of these Recommendations:

- 1) “Coral” is any species of the Order *Scleractinia*, Order *Antipitharia* and Genus *Millepora*.
- 2) “Octocoral” is any species of the Subclass *Octocorallia*, excluding encrusting octocorals (e.g., *Erythropodium caribaeorum*, *Briareum asbestinum*).
- 3) “Relocation” includes all activities that move coral or octocoral fragments or colonies from one place to another (e.g., transplantation, outplanting), including but not limited to moving them into and out of temporary holding locations (e.g., cache, staging, acclimation locations), in-water nurseries or land-based nurseries.

Coral and Octocoral Removal and Relocation

Removal and relocation of corals and octocorals to suitable sites at current or historical, regionally appropriate densities for purposes of project impact minimization should occur on all coastal projects where complete avoidance is not possible. The FWC recommends removal and relocation of coral and octocoral species, but these activities should be considered as minimization of project impacts and not as compensatory mitigation. This minimization effort can be accommodated in both Florida Uniform Mitigation Assessment Method (UMAM) and Habitat Equivalency Analysis (HEA) mitigation assessment methodologies, and would result in lower amounts of compensatory mitigation required for the project relative to the amount of mitigation that would be required if coral removal and relocation was not performed.

Coral and octocoral removal and relocation activities should not occur during times of severe stress (e.g., disease outbreak, coral bleaching, cold stress, significant algal blooms), or from locations being impacted by significant stress events (e.g., areas being impacted by dredging activities or storm water run-off events), unless there are extreme circumstances that warrant an exception. FWC will consider exceptions to this recommendation on a case by case basis when project impacts are imminent and cumulatively harmful, and when benefits outweigh potential risks.

Coral Removal and Relocation Activities

The FWC recommends removal and relocation of all state listed, ESA listed and ESA proposed species of corals regardless of colony size, unless a colony displays signs of disease pursuant to the attached “FWC Coral and Octocoral Visual Health Assessment Protocols.” The current species that are state listed or ESA listed/proposed are as follows:

- *Acropora cervicornis* (ESA and state listed as Threatened)
- *Acropora palmata* (ESA and state listed as Threatened)
- *Dendrogyra cylindrus* (ESA and state listed as Threatened)
- *Mycetophyllia ferox* (ESA and state listed as Threatened)
- *Orbicella annularis* (ESA and state listed as Threatened, formerly *Montastraea*)
- *Orbicella faveolata* (ESA and state listed as Threatened, formerly *Montastraea*)
- *Orbicella franksi* (ESA and state listed as Threatened, formerly *Montastraea*)

Florida Fish and Wildlife Conservation Commission (FWC) Coral and Octocoral Mitigation Relocation Recommendations

The FWC also recommends removal and relocation of all adult corals (defined as colonies 5 cm in diameter or greater and ≥ 2 cm in height), unless a colony displays signs of disease pursuant to the attached “FWC Coral and Octocoral Visual Health Assessment Protocols.” If corals fragment upon removal, fragments 5 cm in diameter or greater and ≥ 2 cm in height should be relocated near each other, as fragments of the same genet are known to readily and successfully fuse (Raymundo and Maypa 2004). Although coral colonies less than 5 cm have been observed to be reproductive (Soong 1993), the FWC recognizes that colonies greater than 5 cm are generally considered to be adults (Bak and Engel 1979, Miller et al. 2000), based on average growth rates (Vaughn 1915) and estimated age of sexual maturity (Connell 1973).

Corals 5 cm in diameter or greater can be successfully relocated. Brownlee (2010) successfully transplanted small corals (*Siderastrea siderea*, *Dichocoenia stokesii*, and *Porites porites*) with greater than 80 percent survivorship after 13 months. Monty et al. (2006) successfully transplanted 250 corals (14 species) ranging from 5 to 40 cm in diameter with a high rate of survivorship. These corals were monitored for 13 months. Eight species had 100 percent survivorship, including 78 *Siderastrea siderea*. Thornton et al. (2000) transplanted 271 corals from an outfall pipe in Broward County to an articulated concrete mat. *Siderastrea siderea* comprised 90 percent of the corals <1 to 100 square centimeters in size. After 27 months, 266 of the corals had survived (87 percent), as compared to 83 percent survival for corals on the nearby natural substrate. In addition, Stephens (2007) analyzed monitoring data from a transplantation effort that salvaged multiple species of coral from a coastal construction impact site in Broward County; survival of the species ranged between 92 and 100% during monitoring periods varying between 18 and 24 months.

The FWC has further prioritized coral species for removal and relocation (in addition to species identified above) in the event that all corals 5 cm in diameter or greater will not be removed and relocated. These coral species have been prioritized and binned based on a high conservation value (i.e., rare, slow-growing, low genetic diversity, slow to recover, sensitive to stress, poor-recruiter, high post-settlement mortality), and the list is as follows:

HIGH PRIORITY SPECIES

- Order *Antipatharia*
- *Agaricia fragilis*
- *Agaricia lamarcki*
- *Colpophyllia natans*
- *Dichocoenia stokesii*
- *Diploria labyrinthiformis*
- *Favia fragum*
- *Isophyllia* spp.
- *Leptoseris cucullata*
- *Madracis* spp.
- *Manicina aereolata*
- *Meandrina meandrites*
- *Montastraea cavernosa*
- *Mussa angulosa*
- *Mycetophyllia* spp.
- *Oculina diffusa*
- *Oculina robusta*
- *Solenastrea hyades*

MEDIUM PRIORITY SPECIES

- *Eusmilia fastigiata*
- *Porites divaricata*, *P. furcata*, *P. porites*
- *Pseudodiploria* spp. (formerly *Diploria*)
- *Sidereastrea siderea* ≥ 10 cm
- *Solenastrea bournoni*
- *Stephanocoenia intersepta* ≥ 10 cm
- *Undaria* spp. (formerly *Agaricia*)

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Coral and Octocoral Mitigation Relocation Recommendations**

LOW PRIORITY

A lower amount of effort should be attributed to removing and relocating the following species, and compensatory mitigation should be designed to offset the loss of any corals not relocated. Alternatively, if the impact area is dominated by these species, effort would be justified to remove and relocate the following species:

- *Porites astreoides*
- *Siderastrea radians*
- *Siderastrea siderea* <10 cm
- *Stephanocoenia intersepta* <10 cm
- *Cladocora arbuscula*
- *Phyllangia* spp.
- *Scolymia* spp.

FWC supports efforts to relocate corals that are less than 5 cm, however we are aware that this may increase project cost due to additional survey design measures to accurately identify coral recruits. For corals that will not be relocated (of any size), FWC recommends coordination with permitted/approved coral nursery/research facilities within the region to determine if they have interest and financial resources to remove corals or accept donated corals.

Octocoral Removal and Relocation Activities

The FWC recommends removal and relocation of all *Gorgonia* species and other octocoral species 10 cm in height or greater, based on the prioritized list below. Similar to corals, these octocoral species are also prioritized based on a high conservation value (i.e., state prohibited species, conservation need, local abundance/density, growth rates, relocation success, and ability to recover naturally). In general, more robust rod species are slow growing and have low recruitment, but transplant well and seem to recover quickly from being transplanted (e.g., growing a new holdfast over attachment material) (Brinkhuis 2009). Plumes are low on the list because they recruit very quickly after a disturbance and have high growth rates so their potential for natural recovery is greater. Additionally, more delicate plume species have less tissue (e.g., thinner tissue = less potential/resources for healing after clipping) and are inferior transplantation candidates. However, plumes can be transplanted successfully (Brinkhuis 2009). The prioritized list is as follows:

- *Antillogorgia* (formerly *Pseudopterogorgia*)
- *Eunicea*
- *Gorgonia* (state prohibited species)
- *Leptogorgia*
- *Muricea*
- *Muriceopsis*
- *Plexaura*
- *Plexaurella*
- *Pseudoplexaura*
- *Pterogorgia*

In addition to the species previously listed, the following are priority genera if deeper relocation sites are targeted (60' +):

- *Diodogorgia*
- *Ellisella*
- *Iciligorgia*
- *Swiftia*
- *Telesto*

Temporary Holding of Corals and Octocorals Prior to Reattachment

If corals and octocorals will be placed in a temporary holding location after removal and prior to reattachment at the relocation site (for caching, staging, acclimation, etc.), the FWC recommends the following criteria be adhered to:

**Florida Fish and Wildlife Conservation Commission (FWC)
Coral and Octocoral Mitigation Relocation Recommendations**

- 1) The temporary holding location for corals and octocorals must be located in a stable area (e.g., low energy, low sedimentation, minimal temperature flux, minimal freshwater input), and err conservatively on the side of being slightly farther from expected project-associated direct and indirect impact areas.
- 2) Coral fragments or colonies must be maintained in a temporary holding location where sediment does not collect, be affixed to an elevated structure, or placed in a suspended container in a manner wherein colonies are above the sea floor and do not touch each other. If coral fragments or colonies are to remain in the temporary holding location for longer than two weeks, fragments or colonies must be cemented or epoxied to an elevated structure or to the sea floor.
- 3) Octocoral colonies must be maintained in a temporary holding location where sediment does not collect, be affixed to an elevated structure, or placed in a suspended bag in a manner wherein colonies are above the sea floor and have adequate water flow (i.e., bags should not be crowded). If octocoral colonies are to remain in the temporary holding location for longer than two weeks, colonies must be attached with zip ties by their holdfast or base to an elevated array or line system previously installed on the sea floor. Orientation is less important, but colonies must not touch each other.
- 4) The installation of any structure to facilitate the temporary holding of corals and octocorals prior to reattachment must also be authorized pursuant to permits that authorize the placement of structures on submerged lands (e.g., Environmental Resource Permit (ERP), Joint Coastal Permit (JCP), USACE Dredge and Fill Permit, Florida Keys National Marine Sanctuary Permit).

Relocation Site Selection

The FWC recommends that the selection of an appropriate relocation site(s) for both corals and octocorals meet the following general criteria:

- 1) Relocation site must be suitable reef habitat, be within the known range of the species or genera, and have historic presence of the species to be relocated (in recent decades).
- 2) Optimally, the relocation site should be located in similar water depths and have similar physical conditions (e.g., light availability, water quality, water circulation) to those at the removal site.
- 3) Optimally, the relocation site should have similar substrate orientation to removal site, e.g., if corals or octocorals are being removed from a vertical or sloped elevated surface, then the relocation site should have similar vertical or sloped areas for relocation.
- 4) The relocation site must be as close in proximity to the removal area as possible to preserve the functional ecosystem value of the surrounding areas provided by the resources to be relocated, but err conservatively on the side of being slightly farther from expected project-associated direct and indirect impact areas.
- 5) Relocation site must not contain large amounts of loose rubble and should not be a high energy environment (Edwards and Clark 1998).
- 6) Relocation site must not be located within a direct or indirect impact area for any permitted, authorized or reasonably foreseeable marine coastal construction activity (e.g., dredging, beach nourishment, pipeline or communication cable installations), or within exclusion or buffer areas (e.g., military, aquaculture).
- 7) Relocation site must have adequate and appropriate space to allow for: 1 - colony growth, tissue re-colonization and plating based on colony size, species growth rates, and maximum size capacity; and 2 - attachment density commensurate with regionally appropriate densities.

Health Assessment

To minimize the risk that diseases are not being spread from the removal area to a temporary holding or relocation site, the FWC recommends a visual health assessment of each coral or octocoral fragment or colony slated for temporary holding or direct relocation be conducted immediately prior to removal pursuant to the

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“FWC Coral and Octocoral Visual Health Assessment Protocols” (attached). Corals and octocorals exhibiting visual signs of disease should not be removed, held temporarily, or relocated.

Corals and octocorals held in a temporary holding location should again be visually assessed for health pursuant to the “FWC Coral and Octocoral Visual Health Assessment Protocols” immediately prior to removal from the temporary holding location and reattachment at the relocation site. **Exception - The visual health assessment does not need to be conducted for coral and octocoral fragments or colonies that have been maintained in a temporary holding location for 48 hours or less.** Any corals or octocorals displaying signs of disease in the temporary holding location should either be: 1 - removed and disposed of and not be reattached, or 2 - donated for ex-situ research.

Removal, Relocation and Reattachment Methodologies

The FWC is available to provide technical expertise to assist with the development of appropriate methodologies for the removal, relocation and reattachment of corals and octocorals for mitigation purposes. The FWC would appreciate the ability to provide additional comments on relocation methodologies and relocation methodology revisions if such information becomes available in the future.

Staff of the Florida Department of Environmental Protection – Coral Reef Conservation Program, NOAA Florida Keys National Marine Sanctuary (Monroe County) and NOAA National Marine Fisheries Service are also available to provide technical expertise on coral removal, relocation and reattachment based on lessons learned on the Florida Reef Tract. Contacts for each of these agencies respective programs can be provided upon request.

Mitigation Plans

The FWC is available to provide technical expertise to assist with the development of appropriate mitigation plans to avoid, minimize and offset project impacts. The FWC would appreciate the ability to provide additional comments on mitigation plans and mitigation plan revisions if such information becomes available in the future.

Monitoring Plans

The FWC recommends that relocated corals and octocorals are monitored for attachment success and survival at one week (may be conducted at any time during the first week), one month, three months, six months, one year and two years post-relocation.

The FWC is available to provide technical expertise to assist with the development of monitoring plans to help gauge mitigation success and identify project impacts, and would appreciate the ability to provide additional comments on monitoring plans and monitoring plan revisions if such information becomes available in the future.

**Florida Fish and Wildlife Conservation Commission (FWC)
Coral and Octocoral Mitigation Relocation Recommendations**

Literature Cited

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Florida Fish and Wildlife Conservation Commission (FWC)
Coral and Octocoral Visual Health Assessment Protocols for Relocation Activities

CORALS

Definitions

For purposes of these Protocols:

- 1) “Coral” is any species of the Order *Scleractinia*, Order *Antipitharia* and Genus *Millepora*.
- 2) “Branching coral” is coral that has numerous branches, and usually secondary branches.
- 3) “Mounding/boulder/foliose coral” is coral that is ball or boulder shaped, or boasts a whorl-like pattern resembling lettuce.
- 4) “Bleaching” for purposes of coral relocation is defined as 100% of coral tissue is discolored due to the loss or reduction in number of endosymbiotic algae (zooxanthellae (Genus *Symbiodinium*)). During bleaching, tissue is present but is pale to white in color.
- 5) “Partial bleaching” is where only a portion of the coral has lost its zooxanthellae, and the remaining areas of tissue appear normal in color.
- 6) “Old mortality” is the non-living portion of exposed coral skeleton which has been overgrown by algae and other biofouling organisms and where the corallite structure has eroded over time and is no longer identifiable. *Not to be confused with “recent mortality.”
- 7) “Recent mortality” is the non-living portion of recently exposed coral skeleton (i.e., skeleton is white and corallite structures are intact and identifiable), including the development of fine “fuzz” or turf algae on exposed skeleton (i.e., skeleton is yellowish in appearance and corallite structure may be slightly eroded but still identifiable), indicating that the mortality occurred within a couple of weeks prior to observation. *Not to be confused with “old mortality.”
- 8) “Relocation” includes all activities that move coral fragments or colonies from one place to another (e.g., transplantation, outplanting), including but not limited to moving them into and out of temporary holding locations (e.g., cache, staging, acclimation locations), in-water nurseries, or land-based nurseries.

Coral Visual Health Assessment

Each coral fragment or colony selected for relocation must be visually assessed pursuant to these Protocols to ensure that they appear to be in good health and are free from suspected disease. This visual health assessment must be conducted immediately prior to removal from each and any location, and may need to be conducted more than once before the relocation activity is completed (e.g., immediately prior to removal from an original collection location, a culture location (nursery), or a temporary holding location established for purposes of caching, staging, acclimation, etc.). **Exception - The visual health assessment does not need to be conducted for coral fragments or colonies that have been maintained in a temporary holding location for 48 hours or less.** Coral fragments or colonies that are located in an original collection or culture location when the visual health assessment is conducted and are exhibiting visual signs of disease may not be removed and relocated to other in-water locations. Coral fragments or colonies that are located in a temporary holding location when the visual health assessment is conducted and are exhibiting visual signs of disease must be removed and disposed of, and this disposition must be noted in any reporting or monitoring documents. **Field personnel conducting coral visual health assessments should be proficient with species identification, and trained in coral disease, predation identification and removal, and survey techniques to assure accuracy of the assessment.** Each fragment or colony must meet the following criteria prior to relocation:

- 1) Branching coral fragments or colonies must have at least 5 cm (approx. 2”) of linear growth or 5 cm (approx. 2”) in diameter. **Exception** – Pursuant to the Relocation Recommendations, all state-listed, Endangered Species Act (ESA) -listed and ESA-proposed coral species should be relocated regardless of size.
- 2) Mounding, boulder or foliose coral fragments or colonies must have at least 2 cm (approx. 1”) of linear growth or height. **Exception** – Pursuant to the Relocation Recommendations, all state-listed, ESA-listed and ESA-proposed coral species should be relocated regardless of size.

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- 3) Show no visible signs of disease or mechanical injury, based on the presence of:
 - a. Bleaching or partial bleaching. **Exceptions** - Partial bleaching is acceptable for relocation of specific coral species for which it is recognized as a part of these coral species' normal, healthy state. These coral species are as follows: *Agaricia fragilis*, *Helioseris cucullata*, *Orbicella franksi*, *Siderastrea radians*, and *Undaria humilis*. Partial bleaching <2 cm on healthy, growing branch tips is also considered acceptable and normal for branching coral species including *Acropora cervicornis*, *Acropora palmata*, *Acropora prolifera*, *Oculina diffusa*, *Millepora alcicornis* and *Millepora complanata*.
 - b. Recent mortality greater than 1% tissue loss exposing underlying skeleton. **Exception** - Old mortality is acceptable for corals that are to be relocated.
 - c. Active disease (e.g., white/black/yellow/red band diseases, white pox or plague diseases, white *Beggiotoa* mats, dark (purple) spot/blotch diseases, growth anomalies).
 - d. Suspect disease indicators (e.g., bands, spots, microbial mats, cyanobacteria colonization).
 - e. Stress indicators (e.g., tissue sloughing, swelling, or thinning; excessive sedimentation; excessive mucous production; or abrasions (mechanical impacts)). **Exception** – As identified in the Mitigation Relocation Recommendations, there may be extreme in which the FWC will consider an exception to this criterion, but exceptions must be made in advance of any relocation activities and approved by the FWC.
 - f. Invasive, encrusting and/or overgrowing tunicates, sponges, octocorals (e.g., *Erythropodium caribaeorum*, *Briareum asbestinum*), zoanthids (e.g., *Palythoa*), or other organisms that cannot be removed (e.g., peeled off) prior to relocation. **Exception** - Corals infected with boring sponges of the genus *Cliona* are acceptable for relocation.
- 4) Corals that are experiencing active predation (e.g., presence in feeding position along tissue loss margin of *Coralliophila abbreviata* and/or *Hermodice carunculata*), may be relocated once all predators are removed.

OCTOCORALS

Definitions

For purposes of these Protocols:

- 1) An “octocoral” is any species of the subclass *Octocorallia*, excluding encrusting octocorals (e.g., *Erythropodium caribaeorum*, *Briareum asbestinum*).
- 2) A “rod” is characterized as having thick branches, and usually secondary branches with thick tissues.
- 3) A “seafan” is characteristically fan shaped with interconnected net-like branching with thin tissues.
- 4) A “plume” is characterized as having thin pinnate (feather-like) branches and branchlets with thin tissues.
- 5) A “holdfast” is the base of an octocoral that attaches the colony to the substrate.
- 6) The “axis” of an octocoral is the central supporting skeletal structure made out of proteinaceous gorgonin that is dark brown to black in color.
- 7) “Bleaching” for the purposes of octocoral relocation is defined as 100% of octocoral tissue is discolored due to the loss or reduction in number of endosymbiotic algae (zooxanthellae). During bleaching, tissue is present but is pale to white in color.
- 8) “Partial bleaching” is where only a portion of the octocoral tissue has lost its zooxanthellae, and the remaining areas of tissue appear normal in color. *Note that octocorals rarely bleach and generally tend to exhibit partial bleaching at their branch tips closest to the water’s surface.
- 9) “Recent mortality” is the non-living portion of recently exposed octocoral axis skeleton (i.e., axis is dark brown to black), including the development of fine “fuzz” or turf algae on exposed axis, indicating that the mortality occurred within a few days prior to observation. **“Old mortality” is not determinable in octocorals.

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- 10) “Relocation” includes all activities that move octocoral colonies from one place to another (e.g., transplantation, outplanting), including but not limited to moving them into and out of temporary holding locations (e.g., cache, staging, acclimation locations), in-water nurseries, or land-based nurseries.

Octocoral Visual Health Assessment

Each octocoral colony selected for relocation must be visually assessed pursuant to these Protocols to ensure that they appear to be in good health and are free from suspected disease. This visual health assessment must be conducted immediately prior to removal from each and any location, and may need to be conducted more than once before the relocation activity is completed (e.g., immediately prior to removal from an original collection location, a culture location (nursery), or a temporary holding location established for purposes of caching, staging, acclimation, etc.). **Exception - The visual health assessment does not need to be conducted for octocoral colonies that have been maintained in a temporary holding location for 48 hours or less.** Octocoral colonies that are located in an original collection or culture location when the visual health assessment is conducted and are exhibiting visual signs of disease may not be removed and relocated to other in-water locations. Octocoral colonies that are located in a temporary holding location when the visual health assessment is conducted and are exhibiting visual signs of disease must be removed and disposed of, and this disposition must be noted in any reporting or monitoring documents. **Field personnel conducting octocoral visual health assessments should be proficient with species identification, and trained in octocoral disease, predation identification and removal, and survey techniques to assure accuracy of the assessment.** Each colony must meet the following criteria prior to relocation:

- 1) Rod, plume and seafan colonies must have at least 10 cm (approx. 4”) of linear growth (height).
- 2) Show no visible signs of disease or mechanical injury based on the presence of:
 - a. Bleaching or partial bleaching.
 - b. Recent mortality greater than 5% of tissue loss exposing axis.
 - c. Active disease (e.g., purple spot, aspergillois, red band disease, black wasting disease, and growth anomalies (severely altered morphology of tissues and skeleton)).
 - d. Suspect disease indicators (e.g., bands, spots or rings (identified by severe dark purpling (25% or greater) or blackening of tissues); microbial mats; cyanobacteria colonization).
 - e. Stress indicators (e.g., tissue sloughing or swelling; excessive sedimentation; excessive mucous production). **Exception** – As identified in the Mitigation Relocation Recommendations, there may be extreme circumstances in which the FWC will consider an exception to this criterion, but exceptions must be made in advance of any relocation activities and approved by the FWC.
- 3) Octocorals that are experiencing active predation (e.g., presence of predators, including *Cyphoma gibbosum* and/or *Hermodice carunculata*, in feeding position along tissue loss margin), may be relocated once all predators are removed. **Exception** – Colonies of *Gorgonia ventalina* with active predation of the nudibranch *Tritonia hamnerorum*, cannot be relocated.