SOUTH ATLANTIC FISHERY MANAGEMENT COUNCIL

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POLICY CONSIDERATIONS FOR DEVELOPMENT OF ARTIFICIAL REEFS IN THE SOUTH ATLANTIC REGION AND PROTECTION OF ESSENTIAL FISH HABITAT

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Introduction

This document provides the South Atlantic Fishery Management Council (SAFMC) guidance regarding protection and mitigation (avoidance, minimization, and compensatory mitigation) of Essential Fish Habitat (EFH) and Habitat Areas of Particular Concern (EFH-HAPCs) related to artificial reef development, placement and maintenance. Artificial reefs, sometimes called "manmade reefs", " fish havens", or "constructed reefs", are broadly defined as any structure placed on the seabed, either deliberately or accidentally (e.g., shipwrecks), that acts similar to natural hard-bottom reefs. Generally structures are not considered artificial reefs until they are purposefully placed on the seafloor for enhancing fish habitat. Artificial reefs function the same as natural reefs ecologically, provide habitat for a wide variety of invertebrates and finfish, and can improve survival for species that are hard-bottom limited. They can enhance existing ecosystems or create new ones to fill in gaps where EFH has been damaged, lost, or severely overfished. Artificial reefs can also provide essential habitat while simultaneously acting as a deterrent to illegal fishing practices in specially managed areas. For these reasons, artificial reefs are considered EFH by the SAFMC.

In addition to serving as EFH, this policy highlights that the Council has designated artificial reefs Special Management Zones (SMZs) as EFH-HAPCs. As a whole, the guidance is consistent with the overall habitat protection policies of the SAFMC as formulated and adopted in the Habitat Plan (SAFMC 1998a), the Comprehensive EFH Amendment (SAFMC 1998b), the Fishery Ecosystem Plan of the South Atlantic Region (SAFMC 2009a), Comprehensive Ecosystem-Based Amendment 1 (SAFMC 2009b), Comprehensive Ecosystem-Based Amendment 2 (SAFMC 2011), and the various Fishery Management Plans (FMPs) of the Council.

For the purposes of policy, the findings assess potential threats and impacts to managed species EFH and EFH-HAPCs and the South Atlantic ecosystem associated with artificial reefs and processes that could improve those resources or place them at risk. The policies and recommendations established in this document are designed to address such impacts in accordance with the habitat policies of the SAFMC as mandated by law. The SAFMC may revise this guidance in response to 1) changes in conditions in the South Atlantic region, 2) applicable laws and regulatory guidelines, 3) new knowledge about the impacts or 4) as deemed as appropriate by the Council.

Policy Considerations

Artificial reefs have the effect of changing habitats from a soft substrate to a hard substrate system or to add vertical profile to low profile (< 1m) hard substrate systems. When artificial reefs are constructed, they provide new primary hard substrate similar in function to newly exposed hard-bottom (Goren 1985). Aside from the often obvious differences in the physical characteristics and nature of the materials involved in creating an artificial reef, the ecological succession and processes involved in the establishment of the epibenthic assemblages occur in a similar fashion on natural hard substrates and artificial hard substrates (Wendt et al. 1989). Demersal reef-dwelling finfish, pelagic planktivores and pelagic predators use natural and artificial hard substrates in very similar ways and often interchangeably (Sedberry 1988). The changes in species composition and local abundance of important species in a specific area are often seen as the primary benefits of reef deployment activities.

As noted by researchers, the physical characteristics of artificial reef habitat may result in differences in the observed behavior of fish species on or around such structures in contrast to behavior observed on equivalent areas of natural hard-bottoms (Bohnsack 1989). Some reef structures, particularly those of higher profile, seem to yield generally higher densities of managed and non-managed pelagic and demersal species than a more widely spread lower profile, natural hard-bottom or reef (Rountree 1989). The fishery management implications of these differences must be recognized and taken into consideration when planning, developing, and managing artificial reefs as essential fish habitat.

The proper placement of artificial materials in the marine environment can provide for the development of a healthy reef ecosystem, including intensive invertebrate communities and fish assemblages of value to both recreational and commercial fishermen. The effectiveness of an artificial reef in the enhancement of fishing varies and is dictated by geographical location, species targeted, stock health, and design and construction of the reef (Bohnsack 1989). Artificial reefs have developed an impressive track-record of providing beneficial results, as estimated in recent models and measured by fishing success for a wide range of finfish species (e.g., Pitcher et al. 2002, Gallaway et al. 2009). To date, artificial reefs have been chiefly employed to create specific, reliable and more accessible opportunities for recreational anglers. They have been used to a lesser extent to enhance commercial fishing probably because artificial reef total area is small compared to much larger, traditionally relied-upon, natural commercial fishing grounds.

Threats to EFH and EFH-HAPCs in Regards to Artificial Reefs

The SAFMC finds that artificial reefs in the South Atlantic enhance EFH for managed species, but can also negatively impact EFH and EFH-HAPCs and managed fisheries if not deployed properly. Table 1 following artificial reef policy and research recommendations, presents a summary of fisheries and habitat designations potentially affected by Artificial Reef development in the South Atlantic as presented in the SAFMC EFH User Guide (http://safmc.net/download/SAFMCEFHUsersGuideFinalNov16.pdf).

SAFMC Policies Addressing South Atlantic Artificial Reefs

The SAFMC establishes the following policies to address development of South Atlantic artificial reefs, and to clarify and augment the general policies already adopted in the Habitat Plan and Comprehensive Habitat Amendment and Fishery Ecosystem Plan (SAFMC 1998a; SAFMC 1998b; SAFMC 2009a).

***General Policies*:**

Uses

1. Artificial reefs serve a variety of purposes beyond recreational activities. These include areas for spawning, breeding, feeding, and growth to maturity of numerous marine organisms including Council-managed species.

2. The Council supports state requests to designate specific artificial reefs as SMZs for research and production in an effort to prevent overexploitation of specific artificial reef sites.

3. Artificial reefs can be used for scientific investigations designed to statistically answer questions that fisheries managers require to successfully manage future sustainable stocks.

Siting

4. Artificial reef managers should consult with all stakeholders (e.g., commercial trawlers) prior to siting in order to reduce user conflict and maximize the value of artificial reefs as EFH.

5. Artificial reefs should be sited in a manner that connects the various life history stages of the target species (i.e., reduces habitat bottlenecks at specific life stages).

6. Properly sited artificial reefs are EFH and are not detrimental to migratory species such as right whales or Atlantic sturgeon.

7. Properly sited artificial reefs are not hazards to navigation; they are charted and deployed with navigation as part of the design.

Construction

8. The SAFMC requires the use of environmentally-safe, long-lasting materials for reef construction, which are stable in their location and avoid any potential danger to other species (e.g., sea turtles) (Barnette 2017).

9. Managers should use proper design and placement (e.g., relief, distance from shore, proximity to other habitats) to target specific life stages and species.

10. The impacts of decommissioning structures such as oil or gas platforms, offshore wind foundations, tactical aircrew combat training system (TACTS) towers, or navigational aids, should be considered on a case-by-case basis.

Mitigation

11. There should be mitigation measures specified if the function of an artificial reef is lost. Artificial reefs can be used to mitigate for damage to natural reefs and for damage to artificial reefs. However, natural (and to an extent artificial) reef habitat is not perfectly replaceable, so caution should be taken to reduce damage to natural and artificial reefs when possible.

12. Investigation on the potential of artificial reef construction to compensate fishers (as in "buy-back") for any future expansion of no harvest SMZ areas should be conducted.

Habitat and Species Research Associated with Artificial Reef Development

The SAFMC encourages the funding of scientific research on the following topics:

Biological

1. Site selection and spatial habitat utilization by life stages and species life histories (e.g., nursery, spawning, etc.).
2. Community dynamics on artificial reefs and how they interact with communities on adjacent habitats.
3. Understanding the application of small scale scientific results to large scale regional fisheries management. E.g., how to apply results from local or specific individual artificial reef sites to a state or regional basis.
4. The feasibility of incorporating artificial reef habitat into ecosystem management and understanding the potential role of artificial reefs in fisheries management.
5. The role of artificial reefs in the recruitment and expansion of invasive species.
6. Explore the connectivity of the designated reef areas regionally, relative to migration between and residence time on, specific sites (e.g., acoustic tagging studies.

Socioeconomics

7. The socioeconomic impacts of artificial reefs relative to the fishing and diving communities, in addition to the economic impact to local coastal municipalities.

Physical

8. The stability, durability, sedimentation, and subsidence of various reef structure metrics and placement in order to maximize ecological benefits and reduce harm (e.g., sea turtle entrapment).

The SAFMC also encourages:

1. Long-term standardized monitoring of artificial reefs and their communities, with the necessary long-term funding, to allow valid future comparisons of temporal and spatial data.
2. Inter-state and/or national collaboration by developing similar data collections with regional or national data access.
3. Development and application of new innovations and techniques to ensure that regulations established for artificial reefs, especially no harvest areas, are enforced and violators are apprehended and prosecuted for illegal use of gears and/or poaching to the fullest extent of the law.
4. Conducting regional public education and outreach regarding the benefits of artificial and human made reefs for special purposes, including no harvest production (MPA and SMZ) areas and disposing of mono-filament fishing lines on shore, away from reefs.
5. Collaborations with regional recreational divers to retrofit many existing artificial reefs with Turtle Excluder Devices (TEDs).

Many habitats in the South Atlantic Region susceptible to the effects of artificial reef development have been designated as EFH and EFH-HAPCs by the SAFMC (Table 1).

Table 1. Habitats designated as Essential Fish Habitat (EFH), their associated managed fisheries/species, and EFH-HAPCs (Source: SAFMC EFH Users Guide 2016).

Essential Fish Habitat	**Fisheries/Species**	**EFH- Habitat Areas of Particular Concern**
Wetlands		
Estuarine and marine emergent wetlands	Shrimp, Snapper Grouper	Shrimp: State designated nursery habitats Mangrove wetlands
Tidal palustrine forested wetlands	Shrimp	
Submerged Aquatic Vegetation		
Estuarine and marine submerged aquatic vegetation	Shrimp, Snapper Grouper, Spiny lobster	Snapper Grouper, Shrimp
Shell bottom		
Oyster reefs and shell banks	Snapper Grouper	Snapper Grouper
Coral and Hardbottom		
Coral reefs, live/hardbottom, medium to high rock outcroppings from shore to at least 600 ft where the annual water temperature range is sufficient.	Snapper Grouper, Spiny lobster, Coral, Coral Reefs and Live Hard/bottom Habitat	The Point, Ten Fathom Ledge, Big Rock, MPAs; The *Phragmatopoma* (worm reefs) off central east coast of Florida and nearshore hardbottom; coral and hardbottom habitat from Jupiter through the Dry Tortugas, FL; Deepwater CHAPCs
rock overhangs, rock outcrops, manganese-phosphorite rock slab formations, and rocky reefs		Snapper-grouper [blueline tilefish]
Artificial reefs	Snapper Grouper	Special Management Zones
Soft bottom		
Subtidal, intertidal non-vegetated flats	Shrimp	
Offshore marine habitats used for spawning and growth to maturity	Shrimp	

Sandy shoals of capes and offshore bars	Coastal Migratory Pelagics	Sandy shoals; Capes Lookout, Fear, Hatteras, NC; Hurl Rocks, SC;
troughs and terraces intermingled with sand, mud, or shell hash at depths of 150 to 300 meters		Snapper-grouper [golden tilefish]
Water column		
Ocean-side waters, from the surf to the shelf break zone, including Sargassum	Coastal Migratory Pelagics	
All coastal inlets	Coastal Migratory Pelagics	Shrimp, Snapper-grouper
All state-designated nursery habitats of particular importance (e.g., PNA, SNA)	Coastal Migratory Pelagics	Shrimp, Snapper-grouper
High salinity bays, estuaries	Cobia in Coastal Migratory Pelagics	Spanish mackerel: Bogue Sound, New River, NC; Broad River, SC
Pelagic Sargassum	Dolphin	
Gulf Stream	Shrimp, Snapper-grouper, Coastal Migratory Pelagics, Spiny lobster, Dolphin-wahoo	
Spawning area in the water column above the adult habitat and the additional pelagic environment	Snapper-grouper	

References and Additional Sources

Barnett, M. C. 2017. Potential impacts of artificial reef development on sea turtle conservation in Florida. NOAA Technical Memo. NMFS-SER-5. doi:10.7289/V5/TM-NMFS-SER-5 26 pp.

Bohnsack, J. A. 1989. Are high densities of fishes at artificial reefs the result of habitat limitation or behavioral preference? Bulletin of Marine Science 44(2): 631-645.

EPA, DOT. 2006. National Guidance: Best Management Practices for Preparing Vessels Intended to Create Artificial Reefs. 77 pp. https://www.epa.gov/sites/production/files/2015-09/documents/artificialreefguidance.pdf

Gallaway, B. J., S. T. Szedlmayer and W. J. Gazey. 2009. A life history review for red snapper in the Gulf of Mexico with an evaluation of the importance of offshore petroleum platforms and other artificial reefs. Reviews in Fisheries Science 17(1): 48-67.

Goren, M. 1985. Succession of a benthic community on an artificial reef substratum at Elat (Red Sea). Journal of Experimental Marine Biology and Ecology 38: 19-40.

NOAA. 2007. National Artificial Reef Plan (as amended): Guidelines for Siting, Construction, Development, and Assessment of Artificial Reefs. National Oceanic and Atmospheric Administration, 1401 Constitution Ave NW, Room 5128, Washington, DC, 20230 60 pp.

NOAA, ASMFC. 2016. National Artificial Reef Workshop Summary. 32 pp. http://www.nmfs.noaa.gov/sfa/management/recreational/documents/natl-artificial-reef-workshop-june2016.pdf

Pitcher, T. J., E. A. Buchary and T. Hutton. 2002. Forecasting the benefits of no-take human-made reefs using spatial ecosystem simulation. ICES Journal of Marine Science 59: S17-S26.

Rountree, R. A. 1989. Association of fishes with fish aggregation devices: effects of structure size on fish abundance. Bulletin of Marine Science 44(2): 960-972.

SAFMC. 1998a. Final Habitat Plan for the South Atlantic region: Essential Fish Habitat requirements for fishery management plans of the South Atlantic Fishery Management Council. South Atlantic Fishery Management Council, 1 Southpark Cir., Ste 306, Charleston, SC 29407-4699. 457 pp. plus appendices.

SAFMC. 1998b. Final Comprehensive Amendment Addressing Essential Fish Habitat in Fishery Management Plans of the South Atlantic Region. Including a Final Environmental Impact Statement /Supplemental Environmental Impact Statement, Initial Regulatory Flexibility Analysis, Regulatory Impact Review, and Social Impact Assessment/Fishery Impact Statement. South Atlantic Fishery Management Council, 1 Southpark Cir., Ste 306, Charleston, SC 29407-4699. 136 pp.

SAFMC. 2009a. Fishery Ecosystem Plan of the South Atlantic Region. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, North Charleston, SC 29405.

SAFMC. 2009b. Comprehensive Ecosystem-Based Amendment 1 for the South Atlantic Region. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Suite 201; North Charleston, SC 29405.

SAFMC. 2011. Comprehensive Ecosystem-Based Amendment 2 for the South Atlantic Region. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Suite 201; North Charleston, SC 29405.

SAFMC. 2016. Users Guide to Essential Fish Habitat Designations by the South Atlantic Fishery Management Council. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Suite 201; North Charleston, SC 29405.

SC DNR. 1991. South Carolina Marine Artificial Reef Management Plan. South Carolina Department of Natural Resources Marine Resources Division, Office of Fisheries Management.

Sedberry, G. R. 1988. Food and feeding of black sea bass, *Centropristis striata*, in live bottom habitats in the South Atlantic Bight. Journal of the Elisha Mitchell Science Society 104(2): 35-50.

Wendt, P. H., D. M. Knott and R. F. Van Dolah. 1989. Community structure of the sessile biota on five artificial reefs of different ages. Bulletin of Marine Science 44(3): 1106-1122.