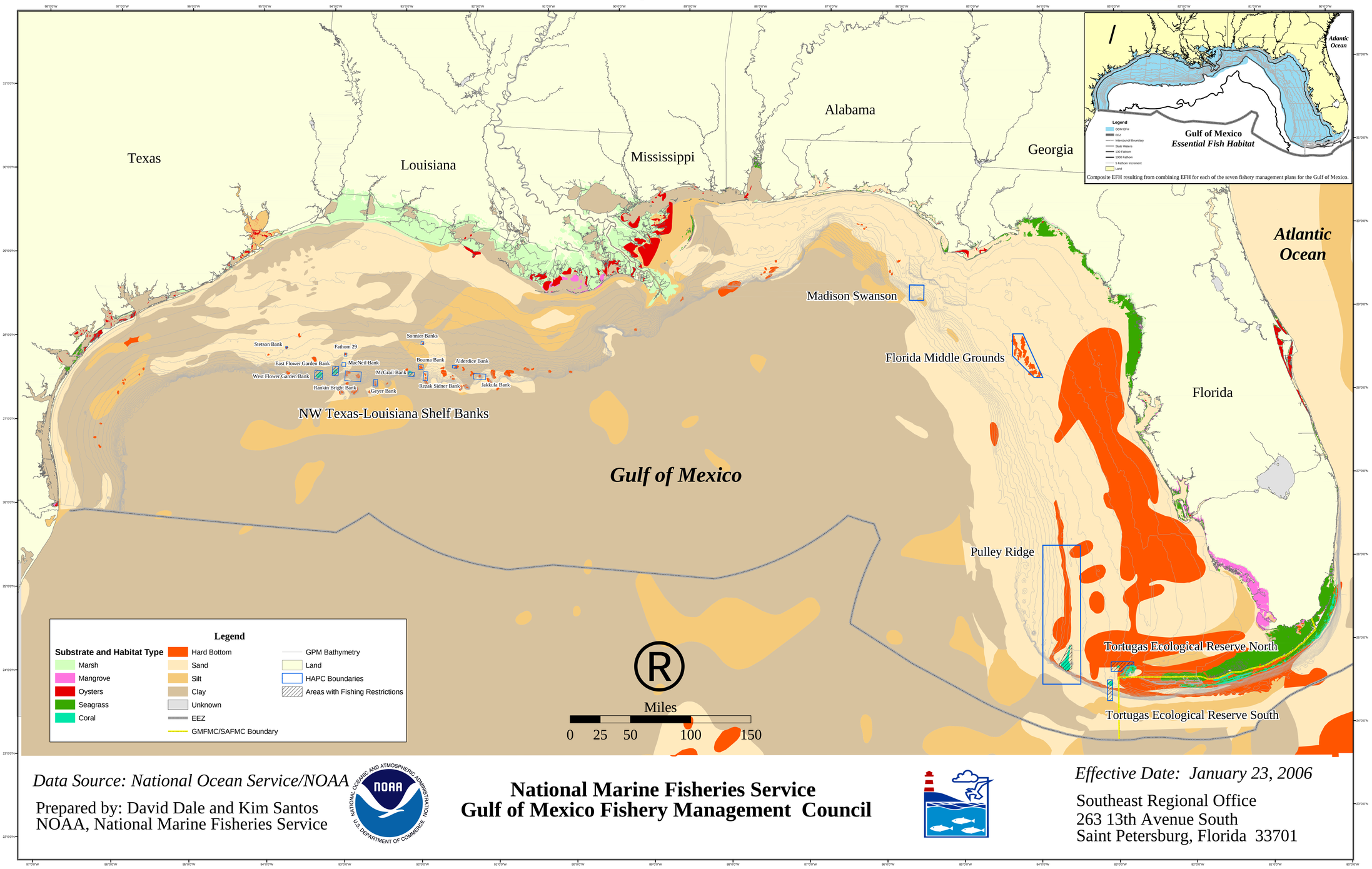
Gulf of Mexico

Habitat Areas of Particular Concern



Data Source: National Ocean Service/NOAA

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DESIGNATING HABITAT AREAS OF PARTICULAR CONCERN FOR THE GULF OF MEXICO USING GIS

The Essential Fish Habitat (EFH) provisions of the Magnuson-Stevens Fishery Conservation and Management Act require NOAA's National Marine Fisheries Service (NMFS) and the regional Fishery Management Councils to describe and identify EFH in the respective Fishery Management Plan (FMP) for each managed fish species. Though not required, Habitat Areas of Particular Concern (HAPC) may be designated, within areas identified as EFH, to focus conservation priorities on specific areas that play a particularly important role in the life cycles of federally managed fish species. The EFH regulation (50 CFR 600.815 (a)(8)) requires HAPCs to be based on one or more of the following considerations:

- The importance of the ecological function provided by the habitat;
- The extent to which the habitat is sensitive to human-induced environmental degradation;
- Whether and to what extent development activities are or will be stressing the habitat; and,
- The rarity of the habitat type.

The designation of HAPCs is intended to identify particularly vulnerable areas to anyone considering actions that might be harmful to habitat considered to be of the highest importance in the life cycles of managed species and most in need of protection. An HAPC is expected to be a localized area of EFH that is especially ecologically important, sensitive, stressed, or rare when compared to the rest of a species EFH geographic range. Identifying the most important habitat areas as HAPC on the basis of their habitat attributes encourages a higher level of scrutiny for conservation, and gives the managed species that occur there an extra buffer against adverse impacts. HAPCs are intended to be very specific, mappable, and definable areas, not broad areas of the Gulf or all areas of a particular habitat. ("HAPCs are localized areas that are especially vulnerable or ecologically important" 50 CFR, Part 600 2357). The Gulf of Mexico Fishery Management Council analyzed each factor using GIS to identify candidate sites for designation as HAPCs.

ECOLOGICAL IMPORTANCE (EI): Queries of life history-habitat use association tables were run for the suite of species in each FMP producing a tally of the number of species/life stages that use each habitat for each of the three ecological functions (breeding/spawning, feeding, growth to maturity). The tally results or scores were used to rank habitats in order of importance for each FMP and normalized across FMPs and ranked again.

The maps of habitat use for the FMPs showed that nearly the entire Gulf of Mexico from the shoreline to the 1,000-fathom isobath has a high habitat use for at least one of the FMPs. Under each FMP, the areas with the highest habitat use were also relatively large and not really appropriate to be identified as HAPCs. This suggested that the metric used to quantify ecological importance (habitat use) is not evaluated at a sufficiently fine scale to be useful in the identification of HAPCs. Most of the HAPC candidate sites identified under the other considerations, however, also met the condition of high ecological importance according to the measure of habitat use.

SENSITIVITY TO FISHING (SF): A quartile scale of potential habitat damage, from 0 (negligible) to 3 (high), was developed from Barnett (2000) and applied across habitat types for each fishing gear that could potentially interact with a habitat type. Summing sensitivity scores across gears developed an aggregate sensitivity score for each habitat. The habitats with the highest scores were given a higher consideration for HAPC designation.

Habitat parcels with the two highest levels of the fishing sensitivity index were selected as candidates for HAPCs. For the most part this identified small areas of coral habitats and hard bottom. These are listed in the table above. A large area of the west Florida shelf classified as hard bottom was considered to be too large to be an HAPC. In fact, the resolution of the habitat classification in this area is poor. While this entire large parcel is identified as hard bottom, only certain patches are actually hard bottom, and these patches are interspersed with soft bottoms. The precise locations of the hard bottom patches are not known and are ephemeral.

SENSITIVITY TO NON-FISHING (SNF): Sensitivity indices were scored, from 0 (no effect) to 3 (large effect), based on the potential severity of a given activity/effect on a specific habitat. Scientific and resource management literature (e.g., National Estuary Program, Comprehensive Conservation Management Plans) were reviewed to provide guidance on scoring non-fishing effects.

The areas with the two highest levels of non-fishing sensitivity are coral and seagrass in the eastern Gulf. The Flower Gardens, a coral area in the western Gulf in the off shore zone, was not included in the analysis of sensitivity to non-fishing activities because it is identified as an HAPC under other fishery management considerations not related to the EFH regulations.

DEVELOPMENT STRESS (DS): Required knowledge of the spatial distribution of those activities in the past, present and possible future in relation to local habitats. GIS data that represented "human-induced non-fishing activities" were gathered from various sources throughout the Gulf of Mexico region. These data were condensed by summing the total effects values for each habitat type by grid and plotting them to show the relative distribution throughout the Gulf.

None of the areas of the eastern Gulf of Mexico was classified as having a high stress index. In fact, nearly all of the least stressed areas occur in this region. High non-fishing stress within the two highest levels of the index occur in Galveston Bay and the marshes of Louisiana.

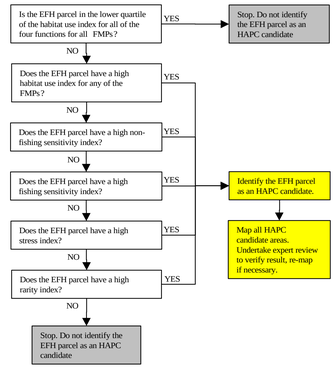
RARITY (R): The rarity of a habitat parcel was measured in terms of the mapped area of the habitat type relative to the total area of all mapped habitat types multiplied by the distance to the nearest neighboring eco-region (Based on the NOAA Fisheries twenty-one (21) statistical grids in the Gulf of Mexico for depicting fishing effort).

Difficulties were encountered with the interpretation of the rarity index. Habitats were identified as being rare in regions one would not expect them to be common (e.g., sand in seagrass dominated areas). Several different types of habitat were identified as being rare in across all eco-regions. All of these are listed as potential HAPCs in the table below, with the exception of the large area of hard bottom on the west-central Florida shelf. Even though this was identified by the analysis as being rare, it was not considered to be an appropriate size for an HAPC.

CANDIDATE SITES IDENTIFIED FOR HAPC DESIGNATION

	EI	S F	S NF	DS	R	HAPC
The Flower Gardens	X	X			X	YES
Dry Tortugas National Park	X	X	X		X	NO
Tortugas Ecological Reserve	X	X	X		X	YES
South Texas Banks	X	X			X	NO
Texas-Louisiana Shelf Break Topographic Features	X	X			X	YES
Mississippi-Alabama Pinnacle Trend	X	X			X	NO
Florida Middle Grounds	X	X			X	YES
Seagrass areas of the Florida Keys	X	X	X			NO
Seagrass areas of the Florida Big Bend	X	X	X			NO
Galveston Bay sand & mangrove	X			X	X	NO
Southwest Louisiana marshes				X		NO
Oyster beds of Vermilion Bay				X		NO
Marsh, mangrove, oyster bed and sand areas of Terrebonne Bay, Caminada Bay and Barataria Bay				X	X	NO
Oyster beds of Breton Sound and Chandeleur Sound					X	NO
Chandeleur Islands (mangroves)					X	NO
Silt areas of Breton Sound and off Biloxi/Gulfport					X	NO
Oyster Beds in Mobile Bay					X	NO
Oyster beds in upper Tampa Bay					X	NO
Oyster Beds of the Caloosahatchee River					X	NO
Sargassum					X	NO
Sand in Whitewater Bay, South Florida					X	NO

Gulf of Mexico Decision Tree for Identifying HAPC



The Council used a panel of experts to review and verify the candidate sites. Designated HAPCs are discrete areas and sites selected to meet one or more of the four criteria. These HAPC sites predominantly contain living coral reefs or hard bottom areas with known coral colonies. They include the following areas: the Florida Middle Grounds; Tortugas North and South Ecological Reserves; and, the individual reefs and banks of the Northwestern Gulf of Mexico (East and West Flower Garden Banks, Stetson Bank, MacNell Bank, 29 Fathom, Rankin Bright Bank, Rezak Sidner Bank, Geyer Bank, McGrail Bank, Bouma Bank, Sonnier Bank, Alderice Bank, and Jakkula Bank). Although Madison-Swanson Marine Reserve did not rank high for ecological importance for many species, the Council chose to include it due to the ecological importance of the habitat to several grouper species. Pulley Ridge is very unique and under current study as potentially the deepest coral reef in the U.S. Due to its unusual benthic productivity the Council chose to include it as an HAPC.

The Council's preferred alternative identified HAPC sites with special consideration with respect to preventing, mitigating, or minimizing adverse effects of fishing actions. As such, the Council also established the following fishing restrictions for the Gulf of Mexico: 1) prohibit bottom anchoring over coral reefs in HAPCs (East and West Flower Garden Banks, McGrail Bank, Pulley Ridge, and North and South Tortugas Ecological Reserves) and on the significant coral resources on Stetson Bank; 2) prohibit the use of trawling gear, bottom longlines, buoy gear, and all traps/pots on coral reefs in the East and West Flower Garden Banks, McGrail Bank, Pulley Ridge, and North and South Tortugas Ecological Reserves HAPCs and on the significant coral communities on Stetson Bank; 3) require a weak link in the tickler chain of bottom trawls on all habitats throughout the Gulf of Mexico exclusive economic zone.

References:

GMFMC. 2004. Final Environmental Impact Statement for the Generic Essential Fish Habitat Amendment to the Fishery Management Plans of the Gulf of Mexico. Gulf of Mexico Fishery Management Council, 2203 N. Lois Avenue, Suite 1100, Tampa, FL 33607.

GMFMC. 2005. Final Generic Amendment Number 3 for Addressing the Essential Fish Habitat Requirements to the Fishery Management Plans of the Gulf of Mexico. Gulf of Mexico Fishery Management Council, 2203 N. Lois Avenue, Suite 1100, Tampa, FL 33607.