

HIGHLY MIGRATORY SPECIES ESSENTIAL FISH HABITAT AMENDMENT - FINAL

Introduction

The highly migratory species (HMS) fisheries in the Exclusive Economic Zone (EEZ) off the West Coast of the United States are managed under the Pacific Fishery Management Council's (Council) HMS Fishery Management Plan (FMP). The FMP was prepared by the Council and approved and implemented by the National Marine Fisheries Service (NMFS) under the Magnuson-Stevens Fishery Conservation and Management Act (MSA) (18 U.S.C. 1801 et seq.). The HMS FMP includes five species of tunas, three species of pelagic shark, striped marlin, swordfish, and dorado (dolphinfish) in the U.S. West Coast EEZ in the Fishery Management Unit (FMU). HMS are harvested commercially and recreationally using a range of gear types. This document describes potential modifications to HMS essential fish habitat (EFH) resulting from the current EFH periodic review. EFH requirements and the process for periodic EFH reviews are described in the EFH regulations at 50 CFR 600.815(a)(10).

The MSA mandates that each FMP describe and identify EFH for the fishery (16 U.S.C. 1853(7)). EFH is defined as "those waters and substrate necessary to fish for spawning, breeding, feeding or growth to maturity" (16 U.S.C. 1802(10)). Under this authority, NMFS and the Council have developed a comprehensive strategy to conserve EFH. This includes incorporating EFH into each of the Council's FMPs, identifying fishing and non-fishing impacts and associated conservation recommendations, and other required EFH elements. In addition to the EFH regulations, further guidance was issued from the NMFS Office of Habitat Conservation on conducting EFH reviews (NMFS 2000).

[Council Operating Procedure 22](#) (PFMC 2023) describes the Council's EFH review process, which consists of a two-phase process. The HMS EFH review is now in the second phase, which concludes in presenting proposed EFH modifications for Council consideration.

This document describes the timeline and process of the EFH review, summarizes proposed EFH modifications, and provides information to support Council decision making in the context of HMS EFH. Appendix F to the HMS FMP contains the detailed identification and description, overall distribution, life history summaries, trophic interactions, and prey species information, on which proposed EFH modifications are based. The draft revised Appendix F is included in Briefing Book materials as Agenda Item F.2 Attachment 2. At the November meeting, the Council should consider Advisory Body input and public comment, and adopt the proposed EFH modifications contained in the FMP and in Appendix F.

History of HMS EFH

The HMS FMP was approved in 2004 and has been amended seven times. EFH components were included as Appendix A to the Final Environmental Impact Statement (EIS) and HMS EFH has not been reviewed since that time. There are currently 11 species in the HMS Fishery Management Unit (FMU), for which EFH must be described:

Sharks:

- common thresher shark (*Alopias vulpinus*)
- shortfin mako shark (*Isurus oxyrinchus*)
- blue shark (*Prionace glauca*)

Tunas:

- North Pacific albacore tuna (*Thunnus alalunga*)
- bigeye tuna (*Thunnus obesus*)
- Pacific bluefin tuna (*Thunnus orientalis*)
- skipjack tuna (*Katsuwonus pelamis*)
- yellowfin tuna (*Thunnus albacares*)

Billfish/Swordfish:

- striped marlin (*Tetrapturus audax*)
- swordfish (*Xiphias gladius*)

Other:

- dorado or dolphinfish (*Coryphaena hippurus*)

HMS EFH Review Timeline

At its March 2020 meeting, the Council initiated scoping for EFH revisions and adopted the Phase 1 Action Plan, in accordance with COP 22. In September 2020, the Council considered the Phase 1 report and agreed to move to Phase 2 of the EFH review. Other key dates and activities included the following:

Month/year	Activity
March 2020	The Council considered Scoping and adopted the Phase 1 Action Plan
June 2020	Call for data and information issued
September 2020	Council considered Phase 1 report , agreed to move to Phase 2
March 2021	Council adopted the Phase 2 action plan
May 1-2 2023	HMSMT meeting with emphasis on EFH
September 2023	Council adopted preliminary HMS EFH modifications for public review
November 2023	Council considers final action on HMS EFH modifications

Proposed modifications to HMS EFH

Summary of EFH Components

The EFH regulations describe mandatory contents (or ‘components’) to be included in FMPs. For HMS EFH, most of the EFH components are found in the main FMP text. Life history summaries, trophic interactions, and prey species are found in FMP Appendix F (see Table 1). The text descriptions of EFH are found in both the FMP as well as in Appendix F. Table 1 lists these

components, where those components can be found (FMP vs Appendix F), and whether they are proposed for modification under this EFH review.

Table 1. Summary of EFH Components

EFH component	Current location	Notes
EFH description & identification	Appendix F (and in FMP, pending)	Updated to reflect recent information on distribution per life stage
Maps	Appendix F	New maps reflecting overall distribution and EFH spatial extent
Life history summaries, including prey species	Appendix F	Updated to reflect recent information on life histories, prey, etc.
Fishing impacts (MSA & non-MSA)	FMP	Text updates; additional information on prey species
Non-fishing impacts	FMP	Minor updates; add Kiffney et al
Conservation & enhancement measures	FMP (with non-fishing impacts)	Minor updates; add Kiffney et al
HAPCs	FMP	Minor text updates; no proposed changes
Research and Information	FMP	Updated based on Advisory Body input
Review/revision process	N/A	Review/revision process described in FMP text; COP 22 referenced

EFH Description and Identification, Maps, and Life History Summaries (In Appendix F)

FMPs are required to describe and identify EFH in text for each life stage of species in an FMU. This should include the physical, biological, and chemical characteristics; the geographic location of habitats described in the FMP; and must include maps of the geographic locations of EFH or the geographic boundaries within which EFH for each species and life stage is found. The regulatory guidance at 50 CFR Part 600 Subpart J provides details on the approach to data and information used to inform EFH, grouping species assemblages when scientifically justified, mapping requirements, and other information. EFH for the 11 HMS species is currently described on an individual basis.

The revised EFH description and identification and life history summaries are based on work completed by the Southwest Fisheries Science Center, supported by NMFS funding. This work included a literature review and summary, public input, and recommendations for modifying elements of HMS EFH, particularly related to species distribution. The revised HMS FMP Appendix F (Agenda Item F.2 Attachment 2) contains the descriptions of overall species

distributions, life history summaries, trophic interactions, primary prey species, proposed EFH descriptions, and maps.

Minor modifications to the description and identification of EFH for HMS species are proposed, based on historic and recent information. The original description and identification were based primarily on fishery-dependent information where data are collected only when and where fishing occurs. Although current fishery-independent information is limited, it represents an incremental improvement over the fishery information used exclusively to identify HMS EFH previously.

Members of the HMS EFH Review Team initially attempted to apply a species distribution model (SDM) approach to generate new EFH and species distribution maps. Specifically, the Review Team evaluated AquaMaps, which generates model-based, large-scale predictions of marine species distributions, based on estimates of a species tolerance to various environmental parameters. The method was originally developed to predict global distributions of marine mammals (Kaschner et al. 2006). To take advantage of additional information available in FishBase and other databases and apply it to a wider variety of marine organisms, this modeling approach was modified in collaboration with FishBase. However, when the Review Team tried to utilize the FishBase modeling results for HMS species, it did not produce accurate distribution maps. For instance, the FishBase model output for bigeye tuna indicates moderately high probability of presence off the Pacific Northwest, although this species is known to be rare in EEZ waters off the Pacific Northwest. Consultation with experts confirmed the results were inaccurate and also revealed a lack of confidence in the underlying data (e.g., due to a lack of fisheries in certain areas). Instead, the Review Team decided to develop new maps for this EFH review based on species distribution data compiled from various data sources by the International Union for Conservation of Nature (IUCN). The IUCN maps provide more accurate approximations of species distributions, provide a consistent source across species, and also allow for production of a shapefile. The HMS EFH Review Team concluded that the maps compiled by the IUCN represent the best available science for regional and worldwide distribution of species managed under the HMS FMP. The development of more robust SDMs is currently underway for HMS in the U.S. West Coast EEZ. The citations for each map are included in Appendix F.

In defining the geographic extent of EFH, guidance from NMFS states “The extent of the EFH should be based on the judgment of the Secretary and the appropriate Council(s) regarding the quantity and quality of habitat that are necessary to maintain a sustainable fishery and the managed species’ contribution to a healthy ecosystem.” The spatial extent should generally encompass all life stages for each species. For all the HMS species except the common thresher shark, the seaward extent of EFH is the EEZ boundary. The seaward extent of thresher shark EFH approximates 100 miles from shore and reflects the fact that this species’ global distribution is closer to shore than other HMS. For six species (bigeye, skipjack, yellowfin and bluefin tunas; striped marlin, and dorado), the northern extent of EFH is the latitude line at Point Conception, California. While these species are known to be present farther north, they are rarer in those waters than the other species in the HMP FMP EFH. The broad distribution of HMS makes it difficult to use a quantifiable metric to define the spatial extent of EFH. Thus, the spatial extent described in Appendix F, though based on the best available information for each species and life stage, is largely qualitative.

Habitat Areas of Particular Concern

The EFH regulations encourage the Councils to identify specific types or discrete areas of habitat within EFH as HAPCs, based on one or more of the following considerations:

1. the importance of the ecological function provided by the habitat.
2. the extent to which the habitat is sensitive to human-induced environmental degradation.
3. whether, and to what extent, development activities are, or will be, stressing the habitat type.
4. the rarity of the habitat type.

The HMS FMP does not currently include any HAPCs, and none are proposed based on the current EFH review. The Council should continue considering information such as shark pupping grounds, key migratory routes, feeding areas, and areas of concentration of large adult females, that would support HAPCs. New information can be considered during the next HMS EFH review.

The proposed FMP text (F.2 Attachment 3) describes the process and considerations regarding potential HMS HAPCs.

Fishing Impacts

FMPs must contain an evaluation of the potential adverse effects of fishing activities on EFH designated under the FMP and describe actions that could be taken to minimize adverse effects to EFH. This includes effects from fishing activities regulated under this FMP as well as other Federal FMPs. FMPs must also identify any fishing activities not managed under the MSA that may adversely affect EFH. The HMS EFH review process, including the literature review and subsequent discussions among the HMSMT, did not identify any new fishing activities or gear different than what is currently included in the HMS FMP. Thus, the fishing impacts section is proposed to remain essentially status quo. The proposed FMP language (F.2 Attachment 3) includes language adopted for public review at the Council's September 2023 meeting.

Non-fishing Impacts and Conservation Measures (7.5 of HMS FMP)

FMPs are required to identify non-fishing activities that may adversely affect EFH. The EFH regulations suggest that “*such activities include, but are not limited to: dredging, filling, excavation, mining, impoundment, discharge, water diversions, thermal additions, actions that contribute to non-point source pollution and sedimentation, introduction of potentially hazardous materials, introduction of exotic species, and the conversion of aquatic habitat that may eliminate, diminish, or disrupt the functions of EFH.*” FMPs are required to describe known and potential impacts to EFH, and to provide conservation recommendations to avoid, minimize, or compensate for adverse effects.

The proposed FMP language (F.2 Attachment 3) describes non-fishing activities that may adversely affect HMS EFH, potential conservation measures, and it incorporates Kiffney et al. 2022 by reference. A brief description of impacts and conservation measures related to offshore wind energy (OSW) development has been added to the FMP itself, noting that a more thorough treatment of OSW as a non-fishing impact is contained in Kiffney et al. 2022. Table 2 below lists the non-fishing activities included in the FMP and/or Kiffney et al. 2022.

Table 1: Non-fishing activities proposed for inclusion in the HMS FMP

Currently in HMS FMP	Kiffney et al. 2022
<ul style="list-style-type: none"> ● Dredging ● Dredge material disposal/fill ● Oil and gas exploration ● Water intake ● Aquaculture ● Wastewater discharge ● Discharge of oil/hazardous substances ● Coastal development impacts 	<ul style="list-style-type: none"> ● Climate change ● Upland and urban development ● Road construction and operation ● Stormwater and urban runoff ● Silviculture ● Dam operations and removal ● Mineral mining ● Oil extraction, shipping, and production ● Energy-related activities (wave/tidal, OSW, cables & pipelines, liquified natural gas) ● Agriculture and grazing ● Shoreline and bank stabilization ● Marine and freshwater transportation ● Coastal development ● Dredging ● Aquaculture ● Overwater structures ● Water intake and discharge facilities ● Pile driving and removal ● Noise pollution

Research and Information Needs

The EFH regulations state that FMPs should identify “*research and data needs for research efforts that the Councils and NMFS view as necessary to improve upon the description and identification of EFH, the identification of threats to EFH from fishing and other activities, and the development of conservation and enhancement measures for EFH.*” The following are based on research needs contained in the HMS FMP and in the Council’s Research and Data Needs database.

- Support efforts to better understand and describe the dynamic nature of HMS habitats, and the potential for shifts in both HMS and their prey in response to changing climate and oceanic conditions. Given that all HMS come to the U.S. EEZ to forage, understanding forage is critical to understanding HMS movements and distributions.

- Continue research that may help to identify important shark habitats such as pupping grounds, key migratory routes, feeding areas, prey species, and areas of concentration of large adult female sharks. Pupping grounds and core nursery areas have not yet been identified and need further study. These areas may not only concentrate pups, but also pregnant females at certain times of the year. This information may help to identify future HMS HAPCs.
- Support efforts to better understand the migratory corridors and habitat dependency, including benthic habitats, of HMS fishes, how they are distributed by season and age throughout the Pacific and within the West Coast EEZ, and how oceanographic changes in habitat and prey species availability affect production, recruitment, and migration. More research is needed in these areas to better define EFH and potential HAPCs.
- Continue efforts to identify and evaluate potential impacts to HMS EFH from fishing activities, including efforts to quantify derelict gear in the fishery and assess its impact on the marine environment and other species.

Review and Revision Process

The EFH regulations require a description of a process to periodically review and revise EFH. The proposed FMP language (F.2 Attachment 3) includes a summary of the Council's two-phase approach to EFH reviews, as described in Council Operating Procedure 22.

References

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