Regional EFH Profile: North Pacific

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Summary
The NOAA Fisheries Alaska Regional Office, Alaska Fisheries Science Center, and North Pacific Fishery Management Council (Council) collaborate closely to identify, describe, and review Essential Fish Habitat (EFH) and Habitat Areas of Particular Concern (HAPCs) for the region's six fishery management plans (FMPs): the Bering Sea/Aleutian Islands Groundfish (BSAI) FMP, Gulf of Alaska Groundfish FMP, BSAI Crab FMP, Scallop FMP, and Salmon FMP. The region recently completed an EFH review in 2015 and presented a Summary Report to the Council in spring of 2016. The region's updated EFH description methodology describes EFH by species and life history stage using level 1 and 2 data. The region is considering fishing effects to habitat with the use of a Fishing Effects (FE) model that calculates potential habitat reduction by estimating impacts and recovery in a continuous time framework.

EFH timeline

Year	Action
1999	Environmental Assessment (EA) completed; EFH first identified and described for all FMPs through individual FMP amendments.[i]
2005	Environmental Impact Statement (EIS) completed; FMP amendments[ii] to update EFH and HAPC and implement habitat conservation measures.
2009	Arctic FMP implemented; EFH described for 3 species
2010	First 5-year EFH review completed for five FMPs (excluding Arctic). HAPC Process defined and aligned with EFH Review, or Council can initiate at its discretion.
2012	Updates to EFH implemented through omnibus amendment[iii]
2015	Second 5-year EFH review completed (including Arctic)
2016	Summary report presented to Council; future actions TBD

EFH identification and review

1999 Initial EFH Descriptions
EFH was first identified in an EA for the region's five FMPs in 1999 and adopted through individual FMP amendments. EFH was broadly described by the general distribution of a species life stage (level 1-2) under all stock conditions; or as the area where one would reasonably expect to find a certain life stage of that species. Scientists added a level 0 to help identify areas where information was not sufficient to describe EFH, however this was not within the regulatory bounds of EFH (and later was removed). No measures were implemented to address habitat impacts from fishing. An up-to-date review of fishing gear characteristics was prepared. A review of non-fishing activities was also included.

2005 EIS

The Alaska Region completed an EIS for EFH Habitat Identification and Conservation in Alaska in 2005 to provide a more thorough analysis of EFH and HAPCs (NMFS 2005). The region adopted a slightly similar approach used in 1999 (EFH based on general distribution); however the availability of GIS datasets and technology reflected updated regulatory guidance and the best available science. EFH was then described as 95% of the general distribution of the population where the species life stage has been documented through fishery independent surveys, research, observations, or catch logs.

For each FMP EFH is described by species and life history stage, primarily using level 1 data (presence/absence) or not at all. Distribution data were available for adult and late juvenile life history stages of some species. For early life stages (egg and larvae), EFH is based on presence/absence data or was inferred. EFH maps derived from this information were then reviewed by stock assessment authors. Changes to EFH descriptions were implemented through amendments to each FMP. The Council also adopted a formalized process for identifying and reviewing potential HAPCs and incorporating stakeholder input through a proposal process.

Fishing effects were analyzed using the Long Term Evaluation of Fishing Effects Index (LEI) model that calculated potential habitat reduction by estimating impacts and recovery in a continuous time framework. This analysis incorporated fishery observer data and a literature review of impacts to species in Alaska. The Council determined that while fishing activity does impact benthic habitat, adverse impacts to EFH are not more than minimal or temporary in nature and do not impact the ability of EFH to support the productivity of managed species. The Council adopted precautionary measures to conserve EFH, including EFH Habitat Conservation and Protection Areas that limit or prohibit bottom contact by certain fishing gears. The LEI was the first attempt to analyze fish habitat and fishing gear interactions.

2009 Arctic FMP

In 2009 the Council adopted a Fishery Management Plan for Fish Resources of the Arctic Management Area, as a precautionary approach to prevent the development of unregulated fisheries in a changing region. EFH is identified, described, and mapped using level 1 data for late juvenile and adult stages of the three species identified as potential commercial targets (Arctic cod, saffron cod, snow crab). Insufficient information exists to describe EFH for early life history stages for these fish. Descriptions were reviewed by stock assessment authors. Additionally in the analysis, an ecosystems component species analysis was prepared.

2010 EFH Review

The Alaska Region's 2010 EFH review process reviewed EFH for all FMPs with the exception of the Arctic FMP. The process resulted in amendments to the Council's FMPs descriptions of EFH and adjusted the Council's timeline for designating HAPCs to align with the 5-year EFH review cycle.[1]

2015 EFH Review

[1] The Council's approach for proposing, reviewing, and designating HAPCs is described in detail in the 2010 HAPC Process Document

In 2015 the region initiated a 5-year review process for all six of the region's FMPs. This process is similar to the process followed in 2010, although focused on three of the ten EFH FMP components, each supported by a technical subgroup. Outputs are reviewed by the Council's Ecosystem Committee, Scientific and Statistical Committee (SSC), and Advisory Panel and subsequently presented to the full Council. This process includes an important role for stock assessment authors and Plan Teams, who are tasked with reviewing outputs from the EFH description methodology and fishing effects analysis.[2]

EFH description methodology

The 2015 EFH review represents a major step forward for the methodology and level of information used to identify and describe EFH. Alaska Fisheries Science Center scientists developed species distribution models for major groundfish and invertebrate species throughout the region, resulting in updated text descriptions and new distribution maps by species, life stage, and season. Information inputs include long-running fishery independent surveys, supplemented with commercial catch data for adult life stages. Models were reviewed by the Council's SSC. The descriptive model outputs were reviewed by stock assessment authors, who recommended updates to EFH descriptions. One outcome of this process is that the level of information used to identify and describe EFH for most life history stages increased from "unknown" to "known" (level 1), or from level 1 to level 2.

A different process was followed for the Salmon and Arctic FMPs. For salmon species, a review team including NOAA Fisheries and Alaska Department of Fish & Game scientists reviewed existing EFH and new information. Stock assessment authors or experts followed a similar approach for the Arctic FMP.

Fishing effects analysis

The LEI model described above was updated and refined (Fishing Effects (FE) model). The changes to the model are significant in many areas. For example, about 2,000 sediment data points in the Bering Sea were available for the 2005/2010 analyses (and the Gulf and Aleutians utilized "shallow" and "deep" habitat proxies); that number has increased to over 400,000 throughout the Gulf, Aleutians, and Bering Sea. The FE model utilizes the Swept Areas Seabed Impacts (SASI) literature database review developed by the New England Fishery Management Council to estimate impacts to habitat. The LEI model was run in continuous time and written in MatLab, while the FE model is run in discrete time and has been converted to R. The most important update, however, has been the implementation of the VMS-enabled Catch-in-Areas database, which incorporates over 600,000 spatially-explicit VMS fishing events into the model at a 25km^2 resolution.

Non-fishing impacts

An updated review of non-fishing effects and impacts to EFH will be provided for review in June 2016. The document will review activities, other than fishing, that may have adverse effects on EFH and includes new sections addressing environmental change, including ocean acidification, and climate change in Arctic waters. Importantly, the document discusses EFH waters as waters that originate as rainfall, groundwater, or snowmelt and later flow into marine waters.

[2] A detailed description of the EFH review process, including roles and responsibilities of technical groups, is available in the NPFMC April 2014 briefing book.

Outcomes

The Alaska Region's EFH process culminated in a summary report that was provided to the Council's Ecosystem Committee, the SSC, and the Advisory Panel, and presented to the Council in April 2016. If the Council chooses to take action, updates or changes would be implemented through FMP amendments. The Council may also identify priorities to inform the HAPC proposal process. The Alaska Region also intends to prioritize stocks for habitat assessment in conjunction with the 5-year review process.

EFH research

The NOAA Fisheries Alaska Regional Office and Alaska Fisheries Science Center coordinate the Alaska Essential Fish Habitat Research Plan (Plan), which directly funds habitat research to address EFH information needs. The Plan supports an annual Request For Proposal (RFP) process to fund EFH research in support of five research priority themes, which focus on identifying, managing, and conserving habitats that are most important to the productivity of federal managed species.

EFH consultations

EFH consultations are conducted by Habitat Conservation Division staff at the NOAA Fisheries Alaska Regional Office. Taking into account that EFH is a national program, the Alaska Region experiences less pressure (by comparison) from the coastal development activities that account for the majority of EFH consultations. However, consultations can play a role in national and cross-regional issues, such as large scale oil and gas developments, mineral mining, hydropower, national military defense, and global seafloor cable projects. The Council and Regional Office have an established process through which Alaska Regional Office Habitat Conservation staff keep the Council apprised of consultations and activities that may impact federally managed fisheries.

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[i] Amendment 55 to the FMP for the Groundfish Fishery of the BSAI, Amendment 55 to the FMP for Groundfish of the GOA, Amendment 8 to the FMP for BSAI King and Tanner crabs, Amendment 5 to the FMP for Scallop Fishery off Alaska, Amendment 5 to the FMP for the Salmon Fisheries in the EEZ off Alaska

[ii] Amendment 78 to the FMP for the Groundfish Fishery of the BSAI Area, Amendment 73 to the FMP for Groundfish of the GOA, Amendment 16 to the FMP for BSAI King and Tanner Crabs, Amendment 9 to the FMP for the Scallop Fishery off Alaska, and Amendment 7 to the FMP for the Salmon Fisheries in the Exclusive Economic Zone (EEZ) off the Coast of Alaska.

[iii] Amendment 98 to the Fishery Management Plan for Groundfish of the Bering Sea and Aleutian Islands Management Area, Amendment 90 to the Fishery Management Plan for Groundfish of the Gulf of Alaska, Amendment 40 to the Fishery Management Plan for Bering Sea/Aleutian Islands King and Tanner Crabs, Amendment 15 to the Fishery Management Plan for the Scallop Fishery off Alaska, and Amendment 1 to the Fishery Management Plan for Fish Resources of the Arctic Management Area