



**NOAA
FISHERIES**

Alaska Region

Essential Fish Habitat: Update and Early 5-year Review Planning

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**April 1, 2019
Ecosystem Committee
North Pacific Fishery Management Council**

Outline

- **EFH Brief**
- **2017 EFH Review Recap**
- **2022 Review Proposed Approach**
 - **EFH Components 1-10**
 - **Potential Outcomes**
 - **Timeline**
- **EFH Research Update**
- **EFH Consultations (non-fishing)**

Magnuson-Stevens Act

In 1996, the Sustainable Fisheries Act amended the Magnuson-Stevens Fishery Conservation and Management Act (MSA) to require each federal FMP to describe and identify EFH, minimize to the extent practicable the adverse effects of fishing on EFH, and identify other actions to encourage the conservation and enhancement of EFH.

16 U.S.C. 1855 MSA Sec. 305 104-297:

(b)(1)(A) The Secretary shall **set forth a schedule** for the amendment of fishery management plans to include the identification of essential fish habitat and for the **review and the updating** of such identifications based upon **new scientific evidence or other relevant information**.

(b)(2)(B) The Secretary, in consultation with participants in the fishery, shall provide each Council with recommendations and information regarding each fishery under that Council's authority to **assist in the identification of essential fish habitat, the adverse impacts on habitat, and the actions that should be considered to ensure the conservation and enhancement** of that habitat.

EFH Final Rule (2002)

[50 CFR 600.815 (a)(10)]

Councils and NMFS should periodically review the EFH provisions of FMPs and revise or amend EFH provisions as warranted based on available information. FMPs should outline the procedures the Council will follow to review and update EFH information.

The review of information should include, but not be limited to, evaluating published scientific literature and unpublished scientific reports; soliciting information from interested parties; and searching for previously unavailable or inaccessible data. Councils should report on their review of EFH information as part of the Annual Stock Assessment and Fishery Evaluation (SAFE) report prepared pursuant to § 600.315(e).

A complete review of all EFH information should be conducted as recommended by the Secretary, but at least once every 5 years.

Council EFH Review History, 2005-2012

2005: FMPs amended to address EFH Final Rule requirements

- Included HAPCs: Seamounts, Bowers Ridge, GOA Coral, GOA Slope

2010: EFH 5-year Review

- Omnibus amendment to revise EFH implemented in 2012
- Skate nursery area HAPC

Summary Report & Council Process

If the review indicates that substantial new information is available, the summary report will recommend potential revisions for each relevant FMP

For example:

- revised EFH descriptions for certain stocks
- updated analysis of fishing and/or non-fishing effects on EFH

The Council will then consider this information and initiate action (proposed FMP amendments) as warranted, or conclude that no further action is needed

If the Council decides to initiate FMP amendments to update EFH components in the FMPs, or consider additional EFH mitigation measures, FMP amendments and associated analysis will proceed through the normal Council process

2017 EFH Review Recap

3 Primary EFH Components Updated

Component 1 - EFH Descriptions and Maps

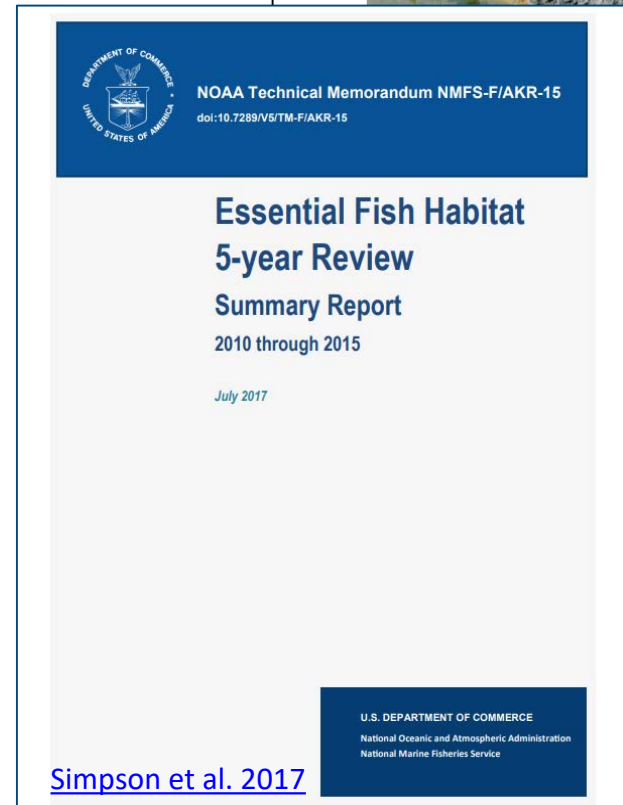
- 5 FMPs amended

Component 2 - Fishing Effects

- New model and analysis
- No management changes

Component 4 - Non-fishing Effects

- Conservation recommendations updated
- New sections on ocean acidification, climate change, and ecosystem processes



[Limpinsel et al. 2017](#)

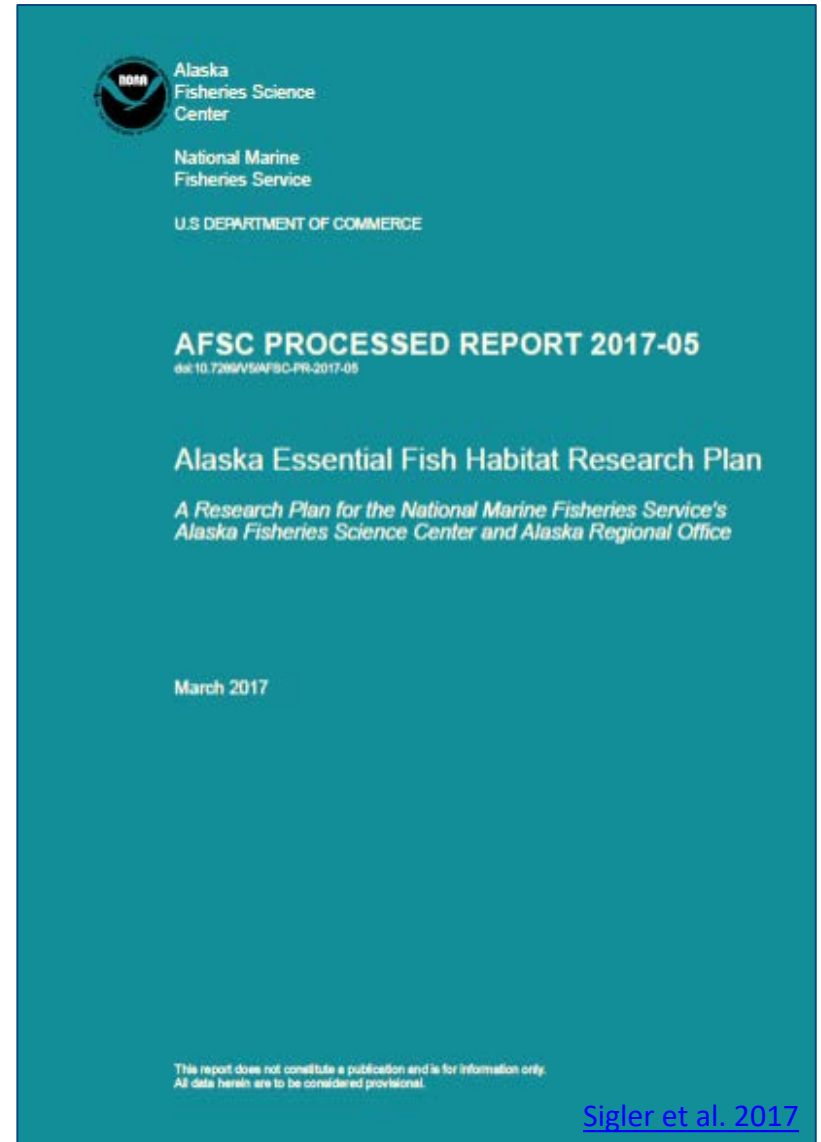
2017 Alaska EFH Revised Research Plan

Authors: Sigler MF, Eagleton MP,
Helser TE, Olson JV, Pirtle JL, Rooper CN,
Simpson SC, and Stone RP

NEW! Multi-year proposals to
accomplish EFH Level-3 information

Single-year proposals still in effect,
traditional approach.

Emphasis is still EFH Level-1 and 2 where
not currently described.



EFH in Fishery Management Plans

Components of EFH in FMPs

1. EFH Descriptions
2. Fishing Activities
3. Non-MSA Fishing Activities
4. Non-fishing Activities
5. Cumulative Impacts
6. EFH Conservation Recommendations
7. Prey Species
8. Habitat Areas of Particular Concern
9. Research Needs
10. Review EFH every five years



2022 Review Approach

1. EFH Descriptions and Identification

1. EFH Descriptions
2. Fishing Activities
3. Non-MSA Fishing Activities
4. Non-fishing Activities
5. Cumulative Impacts
6. EFH Conservation Recommendations
7. Prey Species
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10. Review EFH every five years

EFH Final Rule (67 FR 2343)	What was done in 2017	2022 Review Options
<ul style="list-style-type: none"> i. overview (text and maps) ii. habitat information by life stage iii. analysis of habitat information (levels 1-4) iv. EFH determination v. EFH mapping requirements <p>Councils should strive to describe habitat based on the highest level of detail (i.e., Level 4)</p>	<p>Identify and evaluate new scientific literature and other information. A newly developed model creates model-based EFH definitions. Stock assessment authors review models and outputs.</p> <p>Major update? Yes, species distribution models used to make EFH maps.</p>	<p>Identify and evaluate new scientific literature, models, and other information.</p> <p>Potential actions:</p> <ul style="list-style-type: none"> - Update EFH descriptions/maps - Create model maps for juvenile life stages - Scallop, Salmon

2022 Review Approach

2022 Review Options

Identify and evaluate new scientific literature, models, and other information

Potential actions:

- Update EFH descriptions/maps
- Create model maps for juvenile life stages

Level 1 - *Distribution data*

Level 2 - *Habitat-related densities*

Level 3 - *Growth, reproduction, or survival rates*

Level 4 - *Production rates*



BSAI & GOA Groundfish BSAI Crabs Arctic

- Refine and extend the species distribution modeling methods of 2017
- Apply additional years of AFSC bottom-trawl survey data and new data sources:
 - Alaska Department of Fish and Game small-mesh bottom-trawl survey
 - Update to the AFSC Nearshore Fish Atlas (Johnson et al. 2012; Lindeberg et al. *in progress*)
- Split demersal juvenile life stages into settlement and older juvenile stages
- Apply updated maturity schedules
- Develop the first examples of EFH Level 3 maps
- Raise EFH information levels to Level 1, 2, or 3

1. EFH Descriptions

2. Fishing Activities
3. Non-MSA Fishing Activities
4. Non-fishing Activities
5. Cumulative Impacts
6. EFH Conservation Recommendations
7. Prey Species
8. Habitat Areas of Particular Concern
9. Research Needs
10. Review EFH every five years

2022 Review Approach

2. Fishing Activities that May Adversely Affect EFH

1. EFH Descriptions
- 2. Fishing Activities**
3. Non-MSA Fishing Activities
4. Non-fishing Activities
5. Cumulative Impacts
6. EFH Conservation Recommendations
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9. Research Needs
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EFH Final Rule (67 FR 2343)	What was done in 2017	2022 Review Options
<ul style="list-style-type: none"> i. evaluation ii. minimizing adverse effects iii. practicability iv. options for managing adverse effects from fishing 	<p>Review impacts from fishing gears on EFH. Develop a new fishing effects (FE) model to update the prior LEI fishing effects model to examine impacts of fishing on habitat. SSC review model design, implementation, parameters, and outputs.</p> <p>Major update? Yes, updated LEI model to new FE model.</p>	<p>Do we need to revise fishing impacts on EFH from last 5-yr review?</p> <p>Potential actions:</p> <ul style="list-style-type: none"> - Re-run the FE model with new data - Model localized, small-scale impacts - Provide any new updates to Stock Authors to evaluate any evidence of adverse effects caused by fishing

2022 Review Approach

1. EFH Descriptions
2. Fishing Activities
- 3. Non-MSA Fishing Activities**
4. Non-fishing Activities
5. Cumulative Impacts
6. EFH Conservation Recommendations
7. Prey Species
8. Habitat Areas of Particular Concern
9. Research Needs
10. Review EFH every five years

3. Non-MSA Fishing Activities that May Adversely Affect EFH

EFH Final Rule (67 FR 2343)	What was done in 2017	2022 Review Options
<p>FMPs must identify any fishing activities that are not managed under the MSA that may adversely affect EFH. Such activities may include fishing managed by state agencies or other authorities.</p>	<p>Review changes to halibut and State water fisheries. Identify sources of new information that may shed light on analysis of the impact of these fishing activities.</p> <p>Major update? No.</p>	<p>Do we need to review changes to halibut and State water fisheries and revise analysis from 2005 EIS?</p> <p>Potential actions:</p> <ul style="list-style-type: none"> - Identify sources of new information that may shed light on analysis of fishing impacts from these activities - Salmon fishery impacts to EFH, including sport and personal use - Halibut fishery impacts to EFH, including sport and personal use - State water groundfish fishery impacts to EFH

2022 Review Approach

4. Non-fishing Activities that May Adversely Affect EFH

1. EFH Descriptions
2. Fishing Activities
3. Non-MSA Fishing Activities
- 4. Non-fishing Activities**
5. Cumulative Impacts
6. EFH Conservation Recommendations
7. Prey Species
8. Habitat Areas of Particular Concern
9. Research Needs
10. Review EFH every five years

EFH Final Rule (67 FR 2343)	What was done in 2017	2022 Review Options
<p>FMPs must identify activities other than fishing that may adversely affect EFH. For each activity, the FMP should describe known and potential adverse effects to EFH.</p>	<p>Review changes to non-fishing activities affecting EFH. Update EFH Conservation Recommendations; add new sections on warming trends off Alaska, ocean acidification and marine traffic (in the Arctic); and a more thorough bibliography.</p> <p>Major update? Yes, new non-fishing report (Limpinsel et al. 2017)</p>	<p>Do we need to revise the 2017 Non-Fishing Report or consider other aspects of Non-fishing Activities?</p> <p>Potential actions:</p> <ul style="list-style-type: none"> - Update EFH Conservation Recommendations - Review sections that did not get a thorough look in 2017 - Consider relevancy of current sections (e.g. timber industry) - Build on ecosystem dynamics

Essential Fish Habitat (EFH): An Ecosystem Approach



Essential Fish Habitat (EFH) is defined as the physical, biological and chemical characteristics necessary to support fish for feeding, spawning, breeding, and growth to maturity. Illustrated are some of many key Ecosystem Processes (EFH Attributes) that interact in water to support our fisheries. As defined, EFH is not just hard substrate and structure such as coral and rocks, or kelps and sea grasses. Substrates may define the physical characteristics of the bottom of seas, lakes, watersheds, or associated vegetation. However, the surrounding ecosystem processes influence the physical characteristics of the water and habitat, such as the quality and quantity of water, water temperature, dissolved gases, and bio-chemical interactions that support food chains, fish survival, and promote sustainable fisheries.

Water Cycle

Water enters the atmosphere through evaporation and returns to the land as rain or snow fall, contributing to surface waters or leaching back into the ground water regimes through wetland processes. In many regions, the abundant ground water regimes directly support surface waters and instream flows.

Near Shore Fish Nurseries

Many adult fish species spawn off shore. Their eggs and larvae are transported on coastal currents and tides, and settle in shallow nearshore waters. These coastal nearshore zones provide abundant supplies of "tiny" food sources for small fish and invertebrates to eat. These areas also provide refuge from larger predators. Small fish in nearshore fish nurseries become the big fish we value in our subsistence, sport, and commercial fisheries.

Outwelling Nutrients and Sediments:

Terrestrial vegetation decomposes, providing nutrient rich detritus to streams, river bottoms and soils. Wind and water constantly erode the land. Over time, streams and rivers move detritus and sediments downstream to estuaries and nearshore coastal zones. Sediments resupply substrates and provide foundation for vegetation and habitat for fish and invertebrates. Detritus provides nutrients to marine food chains, and larval and juvenile fish.

Wetlands and Riparian Zones

The function of wetlands and riparian zones are different depending on local geology and hydrology. Generally, wetlands serve to collect, store, and redistribute water over surface or ground aquifers. They act as filtration systems, regulating water temperature, quality and quantity. Riparian vegetation provides shade to cool waters and provide organic nutrients to streams and rivers, feeding invertebrates and fish.

Food and Nutrients

One of the most important though often overlooked EFH Attributes is nutrition. Larval and juvenile fish and invertebrates stand a greater chance of survival when appropriately sized nutrient-rich sources of food are plentiful. Abundant food sources allow fish and invertebrate species to survive harsh winter conditions and reach maturity sooner.

Hyporheic Zone

The hyporheic zone is the unseen water moving through gravel substrates in stream and river bottoms, between ground and surface waters, and surrounding riparian zones. This flowing water regulates temperature and dissolved gas exchange, circulates organic nutrients, removes wastes, and provides habitat for countless aquatic flora and fauna. Pacific salmon, in their most sensitive embryonic phase, survive freezing over winter conditions in the hyporheic zone.

Upwelling Nutrients

All forms of marine plants, animal life, and terrestrial detritus eventually settle to the bottom of seas where they are recycled and converted to other forms of nutrients. Some of these nutrients, sometimes referred to as old nutrient, are driven to the coastal surface waters by winds, currents and tides. These nutrients play an essential role in providing the foundation to marine food chains.

Ground Water

The surface waters we see in streams, rivers, and lakes are often closely connected to and readily interact with unseen groundwater aquifers. In areas where surface and ground waters are closely connected and interactive, withdrawing water from groundwater aquifers alters surface waters, changing instream flows and river discharges, and in coastal areas, may create saltwater intrusion.

Acknowledgments: Funding for this project and poster was provided by NOAA Fisheries, Alaska Region. Illustration and graphic design by Paul Irvin, Alaska Fisheries Science Center.

References: Limpinsel, D. E., Eagleton, M. P., and Hanson, J. L., 2017. Impacts to Essential Fish Habitat from Non-Fishing Activities in Alaska, EFH 5 Year Review: 2010 through 2015. U.S. Dep. Commer., NOAA Tech. Memo. NMFS-F/AKR-14, 229p.

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2022 Review Approach

5. Cumulative Impacts Analysis

1. EFH Descriptions
2. Fishing Activities
3. Non-MSA Fishing Activities
4. Non-fishing Activities
- 5. Cumulative Impacts**
6. EFH Conservation Recommendations
7. Prey Species
8. Habitat Areas of Particular Concern
9. Research Needs
10. Review EFH every five years

EFH Final Rule (67 FR 2343)	What was done in 2017	2022 Review Options
<p>To the extent feasible and practicable, FMPs should analyze how the cumulative impacts of fishing and non-fishing activities influence the function of EFH on an ecosystem or watershed scale. An assessment of the synergistic effects of multiple threats, and an assessment of the ecological risks resulting from the impact of those threats on EFH, also should be included.</p>	<p>Review cumulative impacts analysis discussion in FMPs, and evaluate against new information.</p> <p>Major update? No.</p>	<p>Do we need to revise the cumulative impacts analysis discussion in FMPs and evaluate against new information?</p> <p>Potential actions: TBD</p>

2022 Review Approach

6. EFH Conservation and Enhancement Recommendations

1. EFH Descriptions
2. Fishing Activities
3. Non-MSA Fishing Activities
4. Non-fishing Activities
5. Cumulative Impacts
- 6. EFH Conservation Recommendations**
7. Prey Species
8. Habitat Areas of Particular Concern
9. Research Needs
10. Review EFH every five years

EFH Final Rule (67 FR 2343)	What was done in 2017	2022 Review Options
<p>FMPs must identify actions to encourage the conservation and enhancement of EFH, including recommended options to avoid, minimize, or compensate for the adverse effects identified pursuant to paragraphs (a)(3)-(5) (i.e. non-MSA fishing effects, non-fishing effects, and cumulative impacts), especially in habitat areas of particular concern.</p>	<p>Review EFH recommendations for fishing and non-fishing activities and evaluate against new information to determine whether updates are warranted</p> <p>Major update? No.</p>	<p>Do we need to review any EFH recommendations for fishing and non-fishing activities and evaluate against new information to determine whether updates are warranted?</p> <p>Potential actions: Revisions to EFH Conservation Recommendations dependent on conclusions reached in the following EFH Components:</p> <ol style="list-style-type: none"> 2) Fishing Effects 3) Non-MSA Fishing Activities 5) Cumulative Impacts

2022 Review Approach

1. EFH Descriptions
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9. Research Needs
10. Review EFH every five years

7. Prey Species List and Any Locations

EFH Final Rule (67 FR 2343)	What was done in 2017	2022 Review Options
<p>Actions that reduce the availability of a major prey species or their habitat may be considered adverse effects on EFH if such actions reduce the quality of EFH. FMPs should list the major prey species for the species in the fishery management unit and discuss the location of prey species' habitat. Adverse effects on prey species and their habitats may results from fishing and non-fishing activities.</p>	<p>Review prey species information and determine whether updates are warranted.</p> <p>Major update? No.</p>	<p>Review prey species information and determine whether updates are warranted</p> <p>Potential actions:</p> <ul style="list-style-type: none"> - Habitat Assessment Report updates from Stock Authors - Consider prey items through the lens of Ecosystem Based Fisheries Management

2022 Review Approach

1. EFH Descriptions
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4. Non-fishing Activities
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6. EFH Conservation Recommendations
7. Prey Species
- 8. Habitat Areas of Particular Concern**
9. Research Needs
10. Review EFH every five years

8. HAPC Identification

Text from the EFH Final Rule (67 FR 2343)	What was done in 2017	2022 Review Options
<p>FMPs should identify specific types or areas of habitat within EFH as habitat areas of particular concern based on one or more of the following considerations: importance of ecological function, habitat sensitivity to human-induced degradation, whether development activities are or will be stressing the habitat, and rarity of the habitat.</p>	<p>Council determines whether to initiate a new call for HAPC proposals.</p> <p>Major update? No.</p>	<p>Does the Council want to initiate a new call for HAPC proposals or change HAPC management?</p> <p>Potential actions:</p> <ul style="list-style-type: none"> - Evaluate existing skate HAPCs - Evaluate ideas for HAPC monitoring and management - Initiate HAPC process

2022 Review Approach

1. EFH Descriptions
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8. Habitat Areas of Particular Concern
- 9. Research Needs**
10. Review EFH every five years

9. Research and Information Needs

Text from the EFH Final Rule (67 FR 2343)	What was done in 2017	2022 Review Options
<p>Each FMP should contain recommendations, preferably in priority order, 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 EFH conservation and enhancement measures for EFH.</p>	<p>Identify research necessary to fill gaps in EFH knowledge. Stock Assessment authors recommended items to research for many EFH species.</p> <p>Major update? Not an FMP revision, rather a revised EFH Research Plan (Sigler et al. 2017)</p>	<p>Update and identify research necessary to fill gaps in EFH knowledge</p> <p>Potential actions:</p> <ul style="list-style-type: none"> - Stock Authors recommend items to research - Compare Council and AFSC Research Priorities and determine if still current - Consider emphasizing process-type studies to validate modeling efforts

2022 Review Approach

10. Review EFH Components Every 5 Years

1. EFH Descriptions
2. Fishing Activities
3. Non-MSA Fishing Activities
4. Non-fishing Activities
5. Cumulative Impacts
6. EFH Conservation Recommendations
7. Prey Species
8. Habitat Areas of Particular Concern
9. Research Needs
- 10. Review EFH every five years**

Text from the EFH Final Rule (67 FR 2343)	What was done in 2017	2022 Review Options
<p>Councils and NMFS should <i>periodically review the EFH provisions of FMPs and revise or amend EFH provisions as warranted based on available information</i>. The review of information should include, but not be limited to: evaluating published scientific literature and unpublished scientific reports; soliciting information from interested parties; and searching for previously unavailable or inaccessible data.</p> <p><i>NMFS will develop written recommendations ...</i>The NMFS EFH recommendations may be provided either before the Council’s development of a draft EFH document, or later as a review of a draft EFH document as developed by the Council.</p>	<p>Summary report represents EFH 5-year review.</p> <p>2017 Summary Report</p>	<p>NMFS develops written recommendations to assist the Council in:</p> <ul style="list-style-type: none"> - The identification of EFH - Adverse impacts to EFH - Actions that should be considered to ensure the conservation and enhancement of EFH for each FMP <p>Action: Develop draft Summary Report based on Council and Committee feedback</p>

Potential Outcomes of 2022 Review

EFH Component	Minor Update Only (editorial/add new information)	Potential for More Substantive Update
1. EFH Descriptions		x
2. Fishing Effects		x
3. Non-MSA Fishing		x
4. Non-fishing Effects	x	
5. Cumulative Impacts	x	
6. EFH Cons. Recs.	x	
7. Prey Species	x	
8. HAPC	x	
9. Research Needs	x	
10. Review EFH	Depends on 1-9	Depends on 1-9

- New or revised SDM and habitat information on stocks in the FMPs
- Run FE model with updated fishing data, validate model outputs
- Updated non-fishing activities information and associated EFH Conservation Recommendations
- Identify HAPC priorities, and initiate a call for HAPC proposals
- Update research priorities and information needs

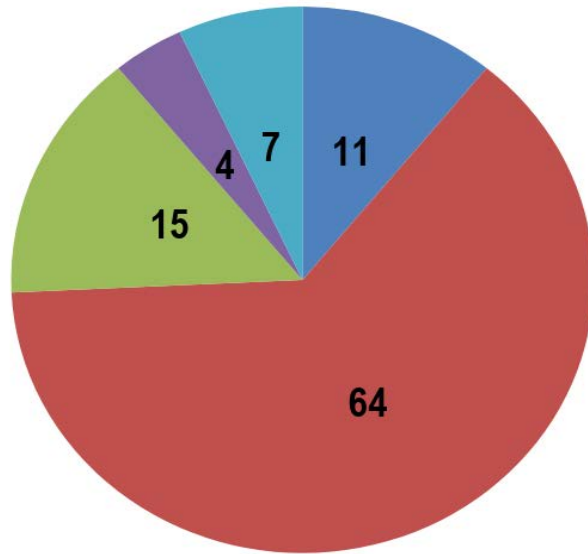
2022 EFH Review Potential Timeline

Table 4 in Ecosystem Committee Document

Jan-Apr 2019	Alaska Region, Council, AFSC staff identify 2022 plan to evaluate the 10 EFH Review Components (Draft a 2022 EFH Review Roadmap)
Apr 2019	Update to Ecosystem Committee on 2022 EFH Review approach, and Council B Reports (Non-Fishing Activities Update)
Oct 2019	Species distribution modeling update to Ecosystem Committee, <i>if appropriate</i>
April 2020	Update on species distribution modeling to Ecosystem Committee, SSC <i>if appropriate</i>
Apr 2020-Dec 2021	Incorporate feedback and finalize recommendations for EFH Review Updates; formulate Review Draft Summary Report; present to Council/Committees <i>as appropriate</i>
Dec 2021	Updated recommendations complete and distributed to stock authors, <i>if applicable</i>
Feb 2022	Stock assessment authors review EFH for target stocks under the 6 Council FMPs, <i>if applicable</i>
March 2022	Assemble and release Internal Council Review Draft Summary Report
Apr 2022	Summary Report for Council review (incl Ecosystem Committee, SSC) Council may consider setting HAPC priorities, and initiating a call for HAPC proposals Council decision as to whether to implement EFH changes and initiate analysis of FMP amendments
Apr-Sep 2022	If the Council decides to amend the FMPs, staff prepare amendments and analysis for EFH changes based on Council recommendations.
Oct 2022	Initial review draft of FMP amendments for EFH changes, Final Summary Report Council decision on whether to formulate HAPC proposals into an amendment analysis
Dec 2022	Council final action on FMP amendments for EFH changes (if any)

EFH Research Projects Update

Projects by Research Priority 2005-2018

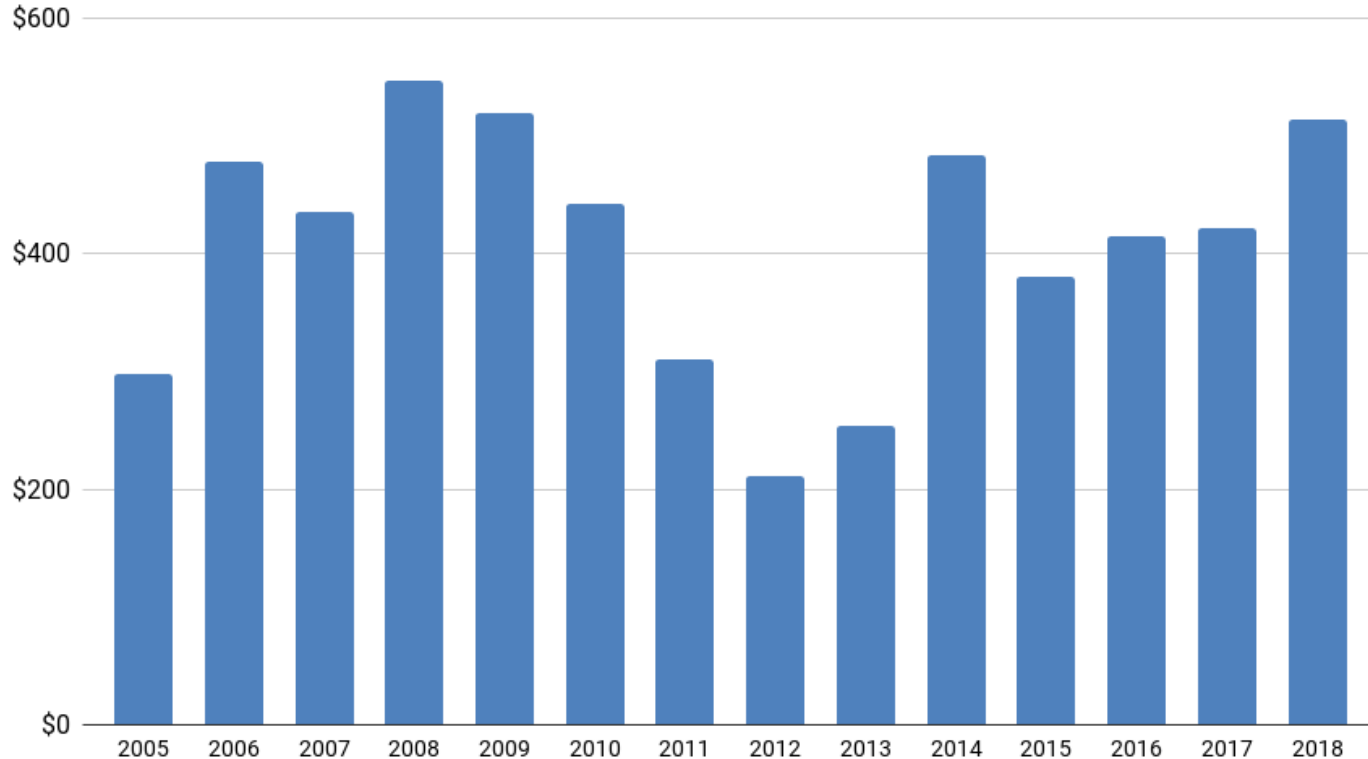


- Characterize Habitat Utilization and Productivity
- Sensitivity, Impact, and Recovery of Disturbed Benthic Habitat
- Recovery Rates, Validate and Improve Habitat Impacts Model
- Seafloor Mapping
- Coastal and Marine Areas Facing Development

- 103 Projects to date
- 85+ Publications
- Total cumulative funding exceeds \$5.8 M

EFH Research Projects Update

EFH Research Funded by Year (\$k) 2005-2018



Additional funds from NOAA Fisheries Office of Habitat Conservation included

FY17 and FY18 EFH Projects Funded

Table 2 in Ecosystem Committee Document

Year Funded	Project Title	Principal Investigators
2017	Optimal overwintering thermal habitat of juvenile walleye pollock from the Bering Sea and the Gulf of Alaska (3-year project)	Laurel, Heintz, Copeman, Hurst, Pirtle
2017	A pilot study for assessing deep-sea corals and sponges as nurseries for fish larvae in the western Gulf of Alaska (1-year project)	Rooper, Wilborn, Goddard
2017	Using habitat characteristics and prey abundance to predict distribution, abundance, and condition of groundfish in the Gulf of Alaska (1-year project)	Ressler, Simonson, Rooper, Punt
2017	Essential fish habitat of flatfish early life stages in the Chukchi Sea (3-year project)	Cooper, Logerwell, Heintz, Cianelli
2017	Juvenile flatfish habitat in the northern Bering Sea (1-year project)	Yeung, Cooper, Copeman, Matta, Yang
2018	Developing a novel approach to estimate habitat-related survival rates for early life history stages using individual-based models (2-year project)	Shotwell, Stockhausen, Gibson
2018	Optimal overwintering thermal habitat of juvenile walleye pollock from the Bering Sea and the Gulf of Alaska (3-year project)	Laurel, Heintz, Copeman, Hurst, Pirtle
2018	Essential habitat of flatfish early life stages in the Chukchi Sea (3-year project)	Cooper, Logerwell, Heintz, Cianelli
2018	A unified nearshore catch database to refine juvenile EFH models and maps for Alaska (2-year project)	Lindeberg, Pirtle, Neff
2018	Is nearshore habitat essential to overwintering YOY Pacific cod? (1-year project)	Kastelle, Helser, Litzow, Laurel
2018	Spatial variation in early juvenile flatfish growth and condition in relation to thermal phases in the eastern Bering Sea Shelf (1-year project)	Yeung, Copeman, Matta, Rooper, Yang
2018	Age effects on thermal habitat requirements on commercial flatfishes (1-year project)	Hurst, Copeman

EFH Projects Proposed for FY19 Funding

Table 2 (cont'd) in Ecosystem Committee Document

Project Title	Principal Investigators	Research Priority*
Optimal overwintering thermal habitat of juvenile walleye pollock from the Bering Sea and Gulf of Alaska (3-year project)	Laurel, Heintz, Copeman, Hurst, Pirtle, Gibson	Characterize habitat utilization and productivity
Developing a novel approach to estimate habitat-related survival rates for early life history stages using individual-based models (2-year project)	Shotwell, Stockhausen, Gibson	Characterize habitat utilization and productivity
Advancing EFH species distribution modeling descriptions and methods for the North Pacific Fishery Management Plan species (2-year project)	Laman, Pirtle, Rooper, Hurst, Conrath	Characterize habitat utilization and productivity
A unified nearshore catch database to refine juvenile EFH Models and maps of Alaska (2-year project)	Lindeberg, Pirtle	Characterize habitat utilization and productivity
Essential fish habitat of juvenile flatfish and Pacific cod early life stages in the Chukchi Sea (3-year project)	Cooper, Logerwell, Heintz, Ciannelli	Characterize habitat utilization and productivity
Spatial variation in early juvenile flatfish growth and condition in relation to habitat quality in the Bering Sea (1-year project)	Yeung, Copeman, Matta, Pirtle, Yang	Characterize habitat utilization and productivity

*Long-term research priorities identified in the Alaska EFH Research Plan include:

- 1) Characterize Habitat Utilization and Productivity
- 2) Assess Sensitivity, Impact, and Recovery of Disturbed Benthic Habitat
- 3) Validate and Improve Habitat Impacts Model
- 4) Map the Seafloor
- 5) Assess Coastal and Marine Habitat Facing Development

EFH Consultations Update

Currently engaging:

- Alaska Liquid Natural Gas Project (FERC)- provided comments on the Draft Environmental Impact Statement (DEIS)
- Grant Lake Hydropower (FERC)
- Pebble Project (USACE/EPA)
- US Coast Guard Programmatic Actions
- Aquaculture facility permits (USACE)
- Harbor Construction/ Dredging Consultations (Juneau, Whittier, St. George, Sandpoint) (USACE)
- Norton Sound Large Placer Mine (Alaska Department of Environmental Conservation)

June 2018 - April 2019 Completed Consultations:

- Navigation Improvements in Kotzebue Harbor, Dutch Harbor, Petersburg Harbor, Port of Nome (USACE)
- Dolphin Installation in Taiya Inlet, Skagway (USACE)
- 2019-20 Alaska Groundfish Fisheries Harvest Specifications
- Tenakee Springs Ferry Terminal Improvement (ADOT)
- Proposed 2019 Beaufort Sea Oil and Gas Lease Sale and Seismic Surveys (BOEM)
- Commercial use floating dock within Duncan Canal (ADNR)
- Red Mountain Underground Gold Project (Canadian Environmental Assessment Agency)
- Nationwide Permits for Survey Activities, Minor Discharges, and Minor Dredging (USACE)
- Alaska Pollutant Discharge Elimination System (PDES) and National PDES General Permits for Offshore Seafood Processors (EPA, ADEC)

Refer to NMFS B Reports Document for more on EFH Consultations and a Pebble Project Update

NOAA Fisheries - Alaska Regional Office

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Thank you!

Extra Slides,
if needed for discussion

Summary of 2017 Review Council Actions

Table 1 in Ecosystem Committee Document

EFH Component	FMP	Final Action
1. EFH description of individual species	BSAI Groundfish	Amendment implemented for all 22 species or complexes whose habitat is described in the FMP, revising some aspect of the EFH description and maps, as described in the summary report
	GOA Groundfish	Amendment implemented for all 23 species or complexes whose habitat is described in the FMP, revising some aspect of the EFH description and maps, as described in the summary report
	BSAI Crab	Amendment implemented for all 5 species or complexes in the FMP, revising general EFH and fishery information for each species, as described in the summary report
	Scallop	No amendments warranted
	Salmon	Amendment implemented for all 5 species in the FMP, revising some aspect of the EFH description and maps, as described in the summary report.
	Arctic	Amendment implemented for 2 of 3 species in the FMP, revising some aspect of the EFH descriptions.
2. Fishing activities that may adversely affect EFH	All FMPs	The FE model represented a substantial improvement from the Long-term Effects Index approach. None of the stock assessment authors concluded that habitat reduction within the core EFH areas for their species was affecting their stocks in ways that were more than minimal or not temporary. None of the authors recommended any change in management with regards to fishing within EFH.
4. Non-fishing activities that may adversely affect EFH	All FMPs	Amendments implemented to update EFH Conservation Recommendations for non-fishing activities.
8. HAPC	All FMPs	No action; status quo. The Council may initiate a call for proposals at any time using the HAPC nomination process.
9. Research and information needs	All FMPs	No action, status quo. Many of the Council and NMFS research questions are still valid and remain to be investigated.

Stock or Common Name	Region	Fishery Management Plan		
		BSAI Groundfish	GOA Groundfish	Arctic Fish Resources
Alaska plaice	EBS	X		
Arrowtooth flounder	AI, EBS, GOA	X	X	
Dover sole	GOA		X	
Flathead sole	EBS, GOA	X	X	
Greenland turbot	EBS	X		
Northern rock sole	GOA		X	
Rex sole	AI, EBS, GOA	X	X	
Yellowfin sole	EBS, GOA	X	X	
Arctic cod	Arctic			X
Saffron cod	Arctic			X
Great sculpin	GOA		X	
Pacific cod	AI, EBS, GOA	X	X	
Sablefish	AI, EBS, GOA	X	X	
Walleye pollock	AI, EBS, GOA	X	X	
Black rockfish	GOA		X	
Blackspotted rockfish	GOA		X	
Dark rockfish	GOA		X	
Dusky rockfish	AI, EBS, GOA	X	X	
Harlequin rockfish	GOA		X	
Northern rockfish	AI, GOA	X	X	
Pacific ocean perch	AI, EBS, GOA	X	X	
Quillback rockfish	GOA		X	
Rougheye rockfish	GOA		X	
Sharpchin rockfish (Slope Complex)	GOA		X	
Shortspine thornyhead	AI, EBS, GOA	X	X	
Shorttraker rockfish	GOA		X	

Stock or Common Name	Region	Fishery Management Plan			
		BSAI Groundfish	BSAI Crabs	GOA Groundfish	Arctic Fish Resources
Bering skate	AI, EBS, GOA	X		X	
Big skate	GOA			X	
Longnose skate	GOA			X	
Snow Crab	Arctic, EBS		X		X
Blue King Crab	EBS		X		
Golden King Crab	AI, EBS		X		
Red King Crab	EBS		X		

Table 3 (cont'd) in Ecosystem Committee Document

Table 5 in Ecosystem Committee Document

EFH FMP Component	Text from the EFH final rule (67 FR 2343)	2010 Review	2015 Review (2017)	2022 Review Plan
1. EFH Descriptions and Identification	<p>i. overview ii. habitat information by life stage iii. analysis of habitat information (levels 1-4) iv. EFH determination v. EFH mapping requirements</p> <p>Councils should strive to describe habitat based on the highest level of detail (i.e., Level 4).</p>	<p>Identify and evaluate new scientific literature, and information from other relevant sources, to see whether species-specific EFH description and identification, as written in the FMPs, is correct.</p>	<p>Identify and evaluate new scientific literature and other information. A newly developed model creates model-based EFH definitions. Stock assessment authors review models and outputs.</p> <p>Major update? Yes, species distribution models used to make EFH maps.</p>	<p>Identify and evaluate new scientific literature, models, and other information.</p> <p>Potential actions: Update EFH descriptions/maps Update Scallop, Salmon Create model maps for juvenile life stages.</p>
2. Fishing activities that may adversely affect EFH	<p>i. evaluation ii. minimizing adverse effects iii. practicability iv. options for managing adverse effects from fishing</p>	<p>Evaluate the various inputs to the existing LEI model to see how they compare with the model inputs from 2004 (a. distribution of the trawl fisheries, b. species recovery rates, c. gear changes in the fisheries that may affect habitat). This should demonstrate whether the impacts analysis from the 2005 EIS is likely to still be valid, or whether it warrants revision.</p>	<p>Review impacts from fishing gears on EFH. Develop a new fishing effects (FE) model to update the prior LEI fishing effects model to examine impacts of fishing on habitat. SSC review model design, implementation, parameters, and outputs.</p> <p>Major update? Yes, new Fishing Effects model.</p>	<p>Do we need to revise fishing impacts on EFH from last 5-yr review?</p> <p>Potential actions Re-run model with new data. Minor change, may decrease size of impacts, #s are low Model localized impacts Analyze patch size of habitat</p>

We refer to this as the **Roadmap** and use it as a working tool to track each EFH component, including work completed in the past and possible future updates, for consideration during the review process

Table 5 (cont'd) in Ecosystem Committee Document

EFH FMP Component	Text from the EFH final rule (67 FR 2343)	2010 Review	2015 Review (2017)	2022 Review Plan
3. Non-Magnuson-Stevens Act fishing activities that may adversely affect EFH	FMPs must identify any fishing activities that are not managed under the MSA that may adversely affect EFH. Such activities may include fishing managed by state agencies or other authorities.	Review whether there have been changes in halibut and State water fisheries. Identify sources of new information that may shed light on analysis of the impact of these fishing activities.	Review changes to halibut and State water fisheries. Identify sources of new information that may shed light on analysis of the impact of these fishing activities. Major update? No.	Do we need to review changes to halibut and State water fisheries and revise analysis from 2005 EIS? Potential actions: Identify sources of new information that may shed light on analysis of the impact of these fishing activities. Salmon fishery impacts to EFH, include sport and personal use fishing Halibut fishery impacts to EFH, include sport and personal use fishing State water groundfish fishery impacts to EFH.
4. Non-Fishing activities that may adversely affect EFH	FMPs must identify activities other than fishing that may adversely affect EFH. For each activity, the FMP should describe known and potential adverse effects to EFH.	Review whether there have been changes to non-fishing activities affecting habitat since the EFH analysis. Identify sources of new information that may shed light on analysis of the impact of non-fishing activities.	Review changes to non-fishing activities affecting EFH. Identify sources of new information that may shed light on analysis of the impact of non-fishing activities. Update EFH Conservation Recommendations; add new sections on warming trends off Alaska, ocean acidification and marine traffic (in the Arctic); and a more thorough bibliography. Major update? Yes, new non-fishing report.(Limpinsel et al. 2017, TM-NMFS-FAKR-14)	Do we need to revise the 2017 non-fishing report? Potential actions: Update EFH Conservation Recommendations. Look at sections and add specific Conservation Recommendations. Ecosystems graphic being done with designers. Review sections that did not get a great look; review others for current relevancy. Link with recent Council Coordination Committee – Habitat Working Group non-fishing discussion.

Table 5 (cont'd) in Ecosystem Committee Document

EFH FMP Component	Text from the EFH final rule (67 FR 2343)	2010 Review	2015 Review (2017)	2022 Review Plan
5. Cumulative impacts analysis	To the extent feasible and practicable, FMPs should analyze how the cumulative impacts of fishing and non-fishing activities influence the function of EFH on an ecosystem or watershed scale. An assessment of the synergistic effects of multiple threats, and an assessment of the ecological risks resulting from the impact of those threats on EFH, also should be included.	Review cumulative impacts discussion in FMPs, and evaluate against new information.	Review cumulative impacts analysis discussion in FMPs, and evaluate against new information. Major update? No.	Do we need to revise the cumulative impacts analysis discussion in FMPs and evaluate against new information?
6. EFH Conservation and Enhancement Recommendations	FMPs must identify actions to encourage the conservation and enhancement of EFH, including recommended options to avoid, minimize, or compensate for the adverse effects identified pursuant to paragraphs (a)(3)-(5) (i.e. non-MSA fishing effects, non-fishing effects, and cumulative impacts), especially in habitat areas of particular concern.	Review EFH recommendations for fishing and non-fishing activities, and evaluate against new information to see whether updates are warranted.	Review EFH recommendations for fishing and non-fishing activities and evaluate against new information to determine whether updates are warranted. Major update? No.	Do we need to review any EFH recommendations for fishing and non-fishing activities and evaluate against new information to determine whether updates are warranted? Potential actions: Revisions to 6 depended on conclusions in #s 2-5 above.

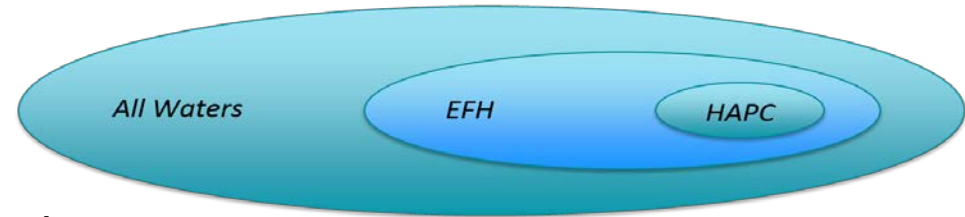
Table 5 (cont'd) in Ecosystem Committee Document

EFH FMP Component	Text from the EFH final rule (67 FR 2343)	2010 Review	2015 Review (2017)	2022 Review Plan
7. Prey species list and any locations	<p>Actions that reduce the availability of a major prey species or their habitat may be considered adverse effects on EFH if such actions reduce the quality of EFH. FMPs should list the major prey species for the species in the fishery management unit and discuss the location of prey species' habitat. Adverse effects on prey species and their habitats may results from fishing and non-fishing activities.</p>	<p>Review prey species information and determine whether updates are warranted.</p>	<p>Review prey species information and determine whether updates are warranted.</p> <p>Major update? No.</p>	<p>Review prey species information and determine whether updates are warranted.</p> <p>Habitat Assessment Reports (HAR) updates from Stock Experts</p> <p>Prey items through the lens of the Ecosystem Based Fisheries Management Umbrella</p>
8. HAPC identification	<p>FMPs should identify specific types or areas of habitat within EFH as habitat areas of particular concern based on one or more of the following considerations: importance of ecological function, habitat sensitivity to human-induced degradation, whether development activities are or will be stressing the habitat, and rarity of the habitat.</p>	<p>Summarize Council's progress on HAPC priorities. Based on species-specific review of EFH, stock assessment authors or Plan Teams may suggest candidate HAPC areas that could be considered by the Council in the next HAPC priority cycle.</p>	<p>Council determines whether to initiate a new call for HAPC proposals.</p> <p>Major update? No.</p>	<p>Does the Council want to initiate a new call for HAPC proposals or change HAPC management?</p> <p>Potential actions: Evaluate skate HAPCs Form a Skate Monitoring Team and include fisherman and NMFS scientists. HAPC Process</p>

Table 5 (cont'd) in Ecosystem Committee Document

EFH FMP Component	Text from the EFH final rule (67 FR 2343)	2010 Review	2015 Review (2017)	2022 Review Plan
9. Research and Information needs	Each FMP should contain recommendations, preferably in priority order, 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 EFH conservation and enhancement measures for EFH.	Review research and information needs, and determine whether updates to EFH research needs identified in the FMPs are warranted.	Identify research necessary to fill gaps in EFH knowledge. Stock Assessment authors recommended items to research for many EFH species. Major update? Yes, as part of the new Research Plan (Sigler et al. 2017, AFSC-PR-2017-05)	Update and identify research necessary to fill gaps in EFH knowledge. Stock Assessment authors recommend items to research for EFH species. Look at Council and AFSC Research priorities and compare items. Big picture items move towards the EFH Research Plan.
10. Review EFH components every 5 years.	Councils and NMFS should periodically review the EFH provisions of FMPs and revise or amend EFH provisions as warranted based on available information. FMPs should outline the procedures the Council will follow to review and update EFH information. The review of information should include, but not be limited to: evaluating published scientific literature and unpublished scientific reports; soliciting information from interested parties; and searching for previously unavailable or inaccessible data. NMFS will develop written recommendations to assist each Council in the identification of EFH, adverse impacts to EFH, and actions that should be considered to ensure the conservation and enhancement of EFH for each FMP. The NMFS EFH recommendations may be provided either before the Council's development of a draft EFH document, or later as a review of a draft EFH document as developed by the Council.	Summary report represents EFH 5-year review.	Summary report represents EFH 5-year review. 2017 Summary Report	Develop Draft Summary Report based on Council and Committee Feedback

EFH Descriptions



EFH Levels within EFH Regulation (50 CFR Part 600)

Level 1 - *Distribution data are available* for some or all portions of the geographic range of the species.

Level 2 - *Habitat-related densities* of the species are available

Level 3 - *Growth, reproduction, or survival rates* within habitats are available.

Level 4 - *Production rates* by habitat are available.

- **600.815 (a)(1)(ii)(B).** FMPs must demonstrate that the best scientific information available was used in the description and identification of EFH, consistent with National Standard 2.
- **600.815 (a)(1)(iii)(B).** Councils should strive to describe habitat based on the highest level of detail (i.e., Level 4). If there is no information on a given species or life stage, and habitat usage cannot be inferred from other means, such as information on a similar species or another life stage, EFH should not be designated.

EFH Review and Update Products

EFH descriptions and maps updated for most groundfish stocks

Alaska EFH Web App *NEW!*

