Appendix D
EFH Text and Map Descriptions for Federally Managed Species of the Alaska Region

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ACRONYMS AND ABBREVIATIONS

ADF&G	Alaska Department of Fish and Game
AI	Aleutian Islands
AKR	Alaska Region
EBS	Bering Sea
BSAI	Bering Sea and Aleutian Islands
cm	centimeter
EA	Environmental Assessment
EEZ	Exclusive Economic Zone
EFH	essential fish habitat
FMP	Fishery Management Plans
FMU	Fishery Management Unit
GIS	geographical information system
GOA	Gulf of Alaska
nm	nautical mile
m	meters
mm	millimeter
Magnuson-Stevens Act	Magnuson-Stevens Fisheries Conservation and Management Act
NMFS	National Marine Fisheries Service
RACE	Resource Assessment and Conservation Engineering Division

Section I Introduction

This appendix describes essential fish habitat (EFH) for federally managed species in the Alaska region in text, tables, and maps. Material is arranged by alternative, with each alternative containing: a general discussion of objective, methodology, and rationale; summary tables; text descriptions of each species; and maps for each species.

Federal Management Plans

EFH is described with text and maps for each life history stage of those federally managed species listed in the five Fishery Management Plans (FMP) for Alaska. The five FMPs and area covered by the FMP are:

1. Bering Sea and Aleutian Islands (BSAI) Groundfish FMP

   The management area for the federally managed BSAI groundfish fisheries effectively covers all of the Bering Sea (EBS) under U.S. jurisdiction, extending southward to include the waters south of the Aleutian Islands (AI) west of long. 170° W, to the border of the U.S. Exclusive Economic Zone (EEZ). The northern boundary of the EBS is the Bering Strait, defined as a straight line from Cape Prince of Whales to Cape Dezhneva.

2. Gulf of Alaska (GOA) Groundfish FMP

   The management area is the entire U.S. EEZ of the North Pacific Ocean, exclusive of the EBS, between the eastern AI at long. 170° W and Dixon Entrance at long. 132° 40' W. (This area is commonly referred to as the GOA.)

3. Scallop Fisheries off the Coast of Alaska FMP

   The management areas covered under the Scallop FMP includes all federal waters of the GOA and the BSAI area. The GOA is defined as the U.S. EEZ of the North Pacific Ocean, exclusive of the EBS, between the eastern AI at long. 170° W and Dixon Entrance at long. 132°40' W. The BSAI is defined as the EEZ south of the Bering Strait to the Alaska Peninsula and AI and extending south of the AI west of long. 170° W.

4. BSAI King and Tanner Crab FMP

   The management area is those waters of the EEZ lying south of Point Hope (lat. 68° 21' N), east of the USSR convention line of 1867, and extending south of the AI for 200 miles between the convention line and Scotch Cap Light (long. 164° 44.6' W).

5. Salmon Fisheries in the EEZ Off the Coast of Alaska FMP

   The management unit of the salmon FMP consists of all of the EEZ off the coast of Alaska (including parts of the GOA, EBS, Chukchi Sea, and Arctic Ocean), and the salmon fisheries that occur there. Two management areas are established within the fishery management unit, with the border between the two at the longitude of Cape Suckling (long. 143°53'36" W). As long as the International Convention for the High Seas Fisheries of the North Pacific Ocean remains in effect (or is replaced by an equivalent convention), the Council leaves the management of the salmon fisheries west

of long. 175° E under the control of the International North Pacific Fisheries Commission (or equivalent organization). Otherwise, this plan will govern the salmon fisheries in the EEZ west of long. 175° E as an integral part of the West Area.

The West Area is the area of the EEZ off the coast of Alaska west of the longitude of Cape Suckling (143°53'36" W). It includes the EEZ in the Bering, Chukchi, and Beaufort Seas, as well as the EEZ in the North Pacific Ocean west of Cape Suckling. The East Area is the area of the EEZ off the coast of Alaska east of the longitude of Cape Suckling.

EFH Descriptive Information Levels

EFH is defined in the Magnuson-Stevens Act as those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity. The regulations specify the following requirements for EFH description. "FMPs must describe and identify EFH in text that clearly states the habitats or habitat types determined to be EFH for each life stage of the managed species. FMPs should explain the physical, biological, and chemical characteristics of EFH and, if known, how these characteristics influence the use of EFH by the species/life stage. FMPs must identify the specific geographic location or extent of habitats described as EFH. FMPs must include maps of the geographic locations of EFH or the geographic boundaries within which EFH for each species and life stage is found....[also] FMPs must demonstrate that the best scientific information available was used in the description and identification of EFH, consistent with national standard 2" (50 CFR 600).

The EFH Final Rule (50 CFR 600) specifies the following approach to gather and organize the data necessary for identifying EFH. Information is to be described using levels of information and all levels should be used to identify EFH, if information exists. The goal of this procedure is to include as many levels of analysis as possible within the constraints of the available data. Councils should strive to obtain data sufficient to describe habitat at the highest level of detail (i.e., Level 4).

Level 1: Distribution data are available for some or all portions of the geographic range of the species. At this level, only distribution data are available to describe the geographic range of a species (or life stage). Distribution data may be derived from systematic presence/absence sampling and/or may include information on species and life stages collected opportunistically. In the event that distribution data are available only for portions of the geographic area occupied by a particular life stage of a species, habitat use can be inferred on the basis of distributions among habitats where the species has been found and on information about its habitat requirements and behavior. Habitat use may also be inferred, if appropriate, based on information on a similar species or another life stage.

Level 2: Habitat-related densities of the species are available. At this level, quantitative data (i.e., density or relative abundance) are available for the habitats occupied by a species or life stage. Because the efficiency of sampling methods is often affected by habitat characteristics, strict quality assurance criteria should be used to ensure that density estimates are comparable among methods and habitats. Density data should reflect habitat utilization, and the degree that a habitat is utilized is assumed to be indicative of habitat value. When assessing habitat value on the basis of fish densities in this manner, temporal changes in habitat availability and utilization should be considered.

Level 3: Growth, reproduction, or survival rates within habitats are available. At this level, data are available on habitat-related growth, reproduction, and/or survival by life stage. The habitats

contributing the most to productivity should be those that support the highest growth, reproduction, and survival of the species (or life stage).

Level 4: Production rates by habitat are available. At this level, data are available that directly relate the production rates of a species or life stage to habitat type, quantity, quality, and location. Essential habitats are those necessary to maintain fish production consistent with a sustainable fishery and the managed species' contribution to a healthy ecosystem.

The regulations specify that Level 1 information, if available, should be used to identify the geographic range of the species at each life stage. If only Level 1 information is available, distribution data should be evaluated (e.g., using a frequency of occurrence or other appropriate analysis) to identify EFH as those habitat areas most commonly used by the species. Levels 2 through 4 information, if available, should be used to identify EFH as the habitats supporting the highest relative abundance; growth, reproduction, or survival rates; and/or production rates within the geographic range of a species.

Existing EFH descriptions (EFH description Alternative 2) include reference to Level 0 and is the only alternative to reference Level 0 information. Level 0 was established by the Alaska Region's (AKR) EFH Team in 1999 to address concerns of how to identify EFH in the data-limited environment the AKR faces. The AKR EFH Team felt the EFH Interim Rule did not adequately provide the level of definition needed for Alaska EFH resources. Further discussion on Level 0 is provided in Sections 2.3.1.2 and D.2.

Important to note is that EFH description Alternatives 3, 4, 5, and 6 do not include Level 0 information and use the level of information definitions (Levels 1 to 4) as defined by the EFH Final Rule, as outlined above. The EFH Final Rule Level of Information definitions were changed to allow the use of habitat information in data-limited situations, such as inference.

EFH Scientific Information

EFH descriptions are interpretations of the best scientific information. In support of this information, a thorough review of FMP species is contained in Section 3.2.1 Biology, Habitat Usage, and Status of Magnuson-Stevens Act Managed Species and detailed by life history stage in Appendix F: EFH Habitat Assessment Reports.

Another important scientific reference, specific to Pacific salmon, is the Alaska Department of Fish and Game's (ADF&G's) *Catalogue of Waters Important for Spawning, Rearing, or Migration of Anadromous Fishes*. The catalogue covers the entire state of Alaska and focuses on freshwater and estuarine areas used by anadromous fishes. The catalogue is divided into six regional areas (see Figure D-1). There are limitations to the catalogue, and many areas in Alaska have not been completely surveyed.

EFH Text Descriptions

The EFH Final Rule (50 CFR 600.815(a)(1)(iv)(B)) states: "FMPs must describe EFH in text, including reference to the geographic location or extent of EFH using boundaries such as longitude and latitude, isotherms, isobaths, political boundaries, and major landmarks. If there are differences between the descriptions of EFH in text, maps, and tables, the textual description is ultimately determinative of the limits of EFH....the boundaries of EFH should be static."

The vastness of the AKR and the large number of individual fish species managed by FMPs asserts a challenge to describe EFH by text using static boundaries. To address this challenge, the AKR EFH Team refers to the boundaries as defined by each Fishery Management Unit (FMU) for each FMP, described on page D-1 of this appendix. FMU boundaries are known geographic locations within the waters of Alaska and reference is included in each species life history text description.

EFH Map Description

EFH guidelines specify FMPs must include maps that display, within the constraints of available information, the geographic location of EFH or the geographic boundaries within which EFH for each species and life stage is found. A geographical information system (GIS) analytical system was used to delineate EFH map descriptions for this analysis. Importantly, EFH descriptive maps are a means to visually present the EFH text description and are complimentary.

EFH Alternative Methodology and Analytical Approach

Each EFH description alternative has a specific methodology and analytical approach to describe EFH. To assess each alternative and evaluate the merits of one particular approach to another, it is important to understand each alternative. At the beginning of each EFH description alternative in Chapter 2, the basic methodology, objective, and rationale for each alternative is provided. Appendix H offers more details about specific GIS analytical approaches used for each EFH description alternative.

The following sections provide a description of alternatives, evaluated in this analysis, for the description and identification of EFH. This EIS includes alternatives for describing EFH for every species and life stage managed under the North Pacific Council's five FMPs for which sufficient information is available. As specified in the EFH regulations, if there is no information on a given species or life stage, and habitat use cannot be inferred from other means, EFH should not be described (50 CFR 600.815(a)(1)(iii)(B)).

Section II EFH Description Alternatives by FMP

D.1 Alternative 1—No EFH Description (No Action)

Under this alternative, the FMPs would be amended to remove any description or identification of EFH.

D.2 Alternative 2 (Status Quo)—Existing EFH General Distribution

Under this alternative, the existing description and identification of EFH contained in the FMPs would remain unchanged. EFH is the general distribution for a species life history stage, if presence/absence information is available. General distribution is used to describe EFH whether higher levels of information exist and are provided under all stock conditions. General distribution is a subset of a species range, encompassing the area that contains about 95 percent of the occurrence for a particular species' life history stage.

In January 1999, these EFH descriptions were made under FMP amendments 55/55/8/5/5. Importantly, *EFH is the text description only* and any mapped areas are only attempts to depict general distribution.

Additionally, the EFH Core Team (a multi-disciplined panel comprised of National Marine Fisheries Service (NMFS) AKR and Alaska Fisheries Science Center staff) decided there was some information for a particular species' life history stage, but not enough to describe EFH using Level 1 information. In

these cases, a Level 0 was established to describe EFH for those life history stages where EFH could be inferred from another life history stage or a species with similar habitat characteristics. Further, the Level 0 was divided into three sub-categories as 0a, 0b, 0c. Level 0 sub-categories are summarized below and are listed in the EFH descriptions for each life stage in Alternative 2.

Classification of EFH Level 0 used in the AKR EFH determinations based on available information. The classification system used in the AKR for Levels 1 to 4 follows NMFS nationwide guidelines.

Level 0	No systematic sampling has been conducted for this species and life stage; may have been caught opportunistically in small numbers during other research.
Level 0a	Some information on a species' life stage upon which to infer general distribution.
Level 0b	No information on the life stage, but some information on a similar species or adjacent life stage from which to infer general distribution.
Level 0c	No information on the actual species' life stage and no information on a similar species or adjacent life stages, or where complexity of a species stock structure prohibited inference of general distribution.

As discussed earlier, Alternative 2 is the only alternative to reference Level 0 information.

Objective

Existing EFH descriptions were analyzed through an environmental assessment process that met the objectives of the Magnuson-Stevens Act and EFH Interim Final Rule guidelines. Specifically, the objective was to identify EFH for each FMP species, by particular life stage and using best scientific information and technology, as only those waters and substrates necessary to the species.

Methodology

The analysis examined fishery observer data and catch data for BSAI Groundfish, GOA Groundfish, BSAI Crab, and Scallop FMP fisheries (Fritz et al. 1998), NMFS survey records, and, where appropriate, Alaska Department of Fish and Game (ADF&G) survey information to select approximately 95 percent of occurrences; as where one would reasonably (with high probability) expect to find a certain life stage of that species. Where this information exists, the area described by this data is EFH. The EFH areas were reviewed by scientific stock assessment authors for accuracy. EFH maps were hand drawn over a template of the FMP area, either BSAI or GOA. Text descriptions for each FMP by life stage were developed (see the 1999 EFH Environmental Assessment [EA] for more information).

For Salmon FMP species, the analysis is focused on two areas: marine and freshwater. Marine salmon EFH was generally described to include all marine waters from the mean higher high water line to the limits of the EEZ, since scientific information indicates salmon are 1) distributed throughout all marine waters during late juvenile and adult life stages, and 2) found nearshore and along coastal migration corridors as early juvenile life stages out migrate and adult life stages return to and from freshwater areas, respectively. Freshwater areas used by egg, larvae, and returning adult salmon will be described as those areas indexed by the ADF&G *Catalogue of Waters Important for the Spawning, Rearing, or Migration of Anadromous Fishes*, specifically Pacific salmon species. Freshwater salmon systems are generally defined as those areas above mean higher tide to the upper limits of those freshwater systems supporting salmon and may include contiguous wetland areas, such as those areas hydrologically connected to the main water source via access channels to an adjacent river, stream, lake, pond, etc.

Rationale

Alternative 2 incorporates basic rationales to describe EFH as general distribution. These rationales are found in the 1999 EFH EA Section 6.0, pages 46-48, and are summarized as follows:

- Areas of higher concentration, based on current information, do not adequately address unpredictable annual differences in spatial distributions of a life stage, nor changes due to long-term shifts in oceanographic regimes;
- All habitats occupied by a species contribute to production at some level;
- A stock's long-term productivity is based on both high and low levels of abundance, and the entire general distribution may be required during times of high abundance;
- Observed concentrations or densities do not necessarily reflect all habitat required to maintain healthy stocks within the ecosystem;
- The use of best scientific information available in a risk-averse fashion and employing an ecosystem approach suggests that, unless the information indicates otherwise, the more inclusive general distribution should be used to describe EFH;
- Density knowledge alone (Level 2 information and higher) would be insufficient to determine that habitat encompassed by general distribution is not essential to maintain healthy stocks and ecosystems and sustain productive fisheries; and
- A broad geographic distribution of essential habitats provides the prey species important for growth, maturation, and diversity that may be required in times of changing environmental conditions.

D.2.1 Description of Essential Fish Habitat for the Groundfish Resources of the BSAI Regions

D.2.1.1 EFH Information Levels for BSAI Groundfish

D.2.1.2 EFH Text Descriptions for BSAI Groundfish

Species	Eggs	Larvae	Early Juveniles	Late Juveniles	Adults
Pollock	1	1	1	1	2
Pacific cod	0a	0a	0a	1	2
Yellowfin sole	0a	0a	0a	1	2
Greenland turbot	0a	0a	0a	1	2
Arrowtooth flounder	0a	0a	0a	1	2
Rock sole	0a	0a	0a	1	2
Other flatfish	0a	0a	0a	1	2
Flathead sole	0a	0a	0a	1	2
Sablefish	0a	0a	0a	1	2
Pacific ocean perch	-	0a	0a	1	1
Northern rockfish	-	0b	0b	1	1
Shortraker rockfish	-	0b	0a-b	0b	1
Rougheye rockfish	-	0b	0a-b	1	1
Dusky rockfish	-	0b	0b	0a	1
Thornyhead rockfish	0a	0a	0a	0a	1
Atka mackerel	0a	0a	0b	0b	2
Squid	0a	-	0a	0a	0a
Other species					
sculpins	0a	0a	0a	0a	1
skates	0a	-	0a	0a	1
sharks	-	-	0a	0a	0a
octopus	0a	-	0a	0a	0a
squid	0a	-	0a	0a	0a
Forage fish species					
smelts	0a	0a	0a	0a	0a
other forage fish	0	0	0	0	0

<u>EFH Definition for BSAI Walleye Pollock</u>

Eggs (duration 14 to 25 days)—Level 1
Pelagic waters of the outer continental shelf and upper slope of the BS from Unimak Island northwest to Zhenchug Canyon. Also in pelagic waters (200 to 400 meters [m] depth) over basin and lower slope areas in the AI and the Aleutian Basin. These are likely areas of upwelling or have gyres. Spawning occurs from February through April.

Larvae (duration 60 days)—Level 1
Epipelagic waters on the inner, middle, and outer continental shelf and upper slope throughout the BS, eastern portions of the Aleutian Basin and throughout the AI. Survival is enhanced where food (copepod nauplii and small euphausiids) is concentrated, such as along semi-permanent fronts (mid-shelf front near the 100-m isobath) in the BS, within ephemeral gyres, and possibly in association with jellyfish.

Juveniles (up to 4 years)—Level 1
Throughout the BS and the AI both pelagically and on-bottom (no known substrate preferences) throughout the inner, middle, and outer shelf regions. At ages 2 and 3 years, pollock are located off-bottom within the water column, principally in the middle and outer shelf regions northwest of the Pribilof Islands. Ranges of juveniles of strong year-classes have varied from throughout the BS (1978 year-class) to almost exclusively north of Zhenchug Canyon (1989 year-class). Feeding areas contain pelagic crustaceans such as copepods and euphausiids.

Adults (4+ years old)—Level 2
Meso-pelagic and semi-demersal habitats (no known substrate preferences) along the middle and outer continental shelf in the BS from the U.S. Russia Convention Line to Unimak Pass and northeast along the Alaska Peninsula and throughout the AI. Adults also exist pelagically over deep Aleutian basin waters. Feeding areas are those that concentrate pelagic crustaceans (e.g., euphausiids) and juvenile fish (primarily juvenile pollock), such as in upwelling regions along the shelf break or fronts on the middle shelf. Known spawning areas in the BS are: north of Unimak Island, along the mid-shelf front (100-m isobath) between Unimak Island and the Pribilof Islands, south of the Pribilof Islands, and possibly at other areas to the north, particularly at heads of submarine canyons. Known spawning areas in the AI are: over deep waters north of Umnak and Unalaska Islands, the region north of the Islands of Four Mountains, through Amukta Pass to Seguam Island, and north of Kanaga and Tanaga Islands. Pollock may prefer waters of 2° to 3°C for spawning.

<u>EFH Definition for BSAI Pacific Cod</u>

Eggs (duration 15 to 20 days)—Level 0a
Areas of mud and sand on the inner, middle, and outer continental shelf and upper slope throughout the eastern BSAI in winter and spring.

Larvae (duration unknown)—Level 0a
Epipelagic waters throughout the eastern BSAI regions in winter and spring.

Early Juveniles (up to 2 years)—Level 0a
Areas of mud and sand and the water column on the inner and middle continental shelf of the eastern BSAI, particularly those with mysids, euphausiids and shrimp.

Late Juveniles (2 to 4 years)—Level 1
Areas of soft substrate (clay, mud, and sand) and the lower portion of the water column on the inner, middle, and outer continental shelf areas of the eastern BSAI, particularly those with mysids, euphausiids, shrimp, pollock, flatfish, crab, and fishery discards.

Adults (4+ years old)—Level 2
Areas of mud and sand along the inner, middle, and outer continental shelf up to 500 m along with the lower portion of the water column of the eastern BSAI. Spawning occurs from January through May near the bottom across broad areas of the shelf, but predominately along the outer shelf between 100 and 200 m in the BS and throughout the area less than 200 m from the AI. After spawning, the mature population spreads out throughout the shelf in the eastern BSAI, but with concentrations along the outer shelf northwest of the Pribilof Islands and along the outer and middle shelf areas northwest of the Alaskan Peninsula and into Bristol Bay. Feeding areas are those containing pollock, flatfish, and crab.

EFH Definition for BSAI Yellowfin Sole

Eggs (duration unknown)—Level 0_a
Pelagic inshore waters of the southeastern BS shelf from Norton Sound to Bristol Bay in spring and summer.

Larvae (duration 2 to 3 months)—Level 0_a
Pelagic inshore waters of the southeastern BS shelf from Norton Sound to Bristol Bay in spring, summer, and fall.

Early Juveniles (to 5.5 years old)—Level 0_a
Demersal areas (bottom and lower portion of the water column) on the inner, middle, and outer portions of the continental shelf (down to 250 m) and within nearshore bays of the BS.

Late Juveniles (5.5 to 9 years old)—Level 1
Areas of sandy bottom along with the lower portion of the water column within nearshore bays and on the inner, middle and outer portions of the continental shelf (down to 250 m) of the BS south of St. Matthew Island (approximately 61° N) and in Norton Sound. Feeding areas would be those containing polychaetes, bivalves, amphipods, and echiurids.

Adults (9+ years old)—Level 2
Areas of sandy bottom along with the lower portion of the water column on the inner, middle and outer portions of the continental shelf (down to 250 m) of the BS south of St. Matthew Island (approximately 6° N) and in Norton Sound. Areas of known concentrations vary seasonally. Adult spawning areas in summer (May through August) are located along the inner shelf from Cape Constantine to Cape Peirce, throughout Kuskokwim Bay, and north of Nunivak Island. Summer (June through October) feeding concentrations of adults are located along the inner and middle portions of the shelf from Kuskokwim and Bristol Bays south along the Alaskan Peninsula to Amak Island, and northwest to St. Matthew Island. Feeding areas would be those containing polychaetes, bivalves, amphipods, and echiurids. In winter, yellowfin sole adults migrate to deeper waters of the shelf (100 to 200 m) south of 60° N to the Alaskan Peninsula.

EFH Definition for BSAI Greenland Turbot

Eggs (duration unknown)—Level 0_a
Benthypelagic waters of the outer continental shelf and slope in the BS and throughout the AI.

Larvae (8 to 9 months)—Level 0_a
Pelagic waters of the outer continental shelf, slope, and adjacent basin in the BS and throughout the AI.

Early Juveniles (to 4 years old)—Level 0_a
Substrate and lower portion of the water column of the inner, middle, and outer portions of the continental shelf and the adjacent upper slope region of the BS and throughout the AI.

Late Juveniles (4 to 5 years old)—Level 1
Substrate (particularly mud and muddy-sand) and lower portion of the water column of the middle and outer continental shelf and adjacent upper and lower slope regions of the BS and throughout the AI. Feeding areas would be those containing euphausiids, polychaetes, and small fish.

Adults (5+ years old)—Level 2
Substrate (particularly mud and muddy-sand) and lower portion of the water column of the outer continental shelf and adjacent upper and lower slope regions of the BS and throughout the AI. Feeding areas would be those containing pollock and small fish.

EFH Definition for BSAI Arrowtooth Flounder

Eggs (duration unknown)—Level 0_a
Pelagic waters of the middle and outer continental shelf and slope in the BS and throughout the AI in winter.

Larvae (duration 2 to 3 months)—Level 0_a
Pelagic waters of the inner, middle, and outer continental shelf and adjacent nearshore bays in the BS and throughout the AI.

Early Juveniles (to 2 years old)—Level 0_a
Areas of gravel, sand, and mud and the associated water column of the inner continental shelf and the adjacent nearshore bays in the BS and throughout the AI.

Late Juveniles (2 to 4 years old)—Level 1
Areas of gravel, sand, and mud and the associated water column of the middle and outer continental shelf and adjacent upper slope regions of the BS and throughout the AI. Feeding areas would be those containing euphausiids, crustaceans, and small fish.

Adults (4+ years old)—Level 2
Areas of gravel, sand, and mud and the associated water column of the middle and outer continental shelf and adjacent upper slope regions of the BS and throughout the AI. Summer feeding areas on the middle and outer shelf would be those containing gadids, euphausiids, and other fish. Spawning areas in winter are on the outer shelf and upper slope regions.

EFH Definition for BSAI Rock Sole

Eggs (duration unknown)—Level 0_a
Areas of pebbles and sand on the middle and outer continental shelf in the BS in winter (December through March).

Larvae (duration 2 to 3 months)—Level 0_a
Pelagic waters of the BS over the inner, middle, and outer continental shelf, the slope, and the Aleutian Basin.

Early Juveniles (to 3.5 years old)—Level 0_a
Inner, middle, and outer portions of the continental shelf along with the lower portion of the water column of the BS south of 61° N and in Norton Sound. Feeding areas would be those containing polychaetes, bivalves, amphipods, and crustaceans.

Late Juveniles (3.5 to 8 years old)—Level 1
Areas of pebbles and sand along with the lower portion of the water column within nearshore bays and on the inner, middle, and outer portions of the continental shelf of the BS south of 61° N and in Norton Sound. Feeding areas would be those containing polychaetes, bivalves, amphipods, and crustaceans.

Adults (8+ years old)—Level 2
Areas of pebbles and sand along with the lower portion of the water column on the inner, middle, and outer portions of the continental shelf of the BS south of 61° N and in Norton Sound. Areas of known concentrations vary seasonally and include adult spawning areas in winter and feeding areas in summer (May through October), which include Bristol Bay, portions of outer Kuskokwim Bay, north of the Alaskan Peninsula to Unimak Island, and near the Pribilof Islands. Feeding areas would be those containing polychaetes, bivalves, amphipods, and crustaceans.

EFH Definition for BSAI Other Flatfish—Alaska Plaice

Eggs (duration unknown)—Level 0_a
Pelagic waters of the middle and outer continental shelf of the BS in spring and early summer.

Larvae (duration 2 to 4 months)—Level 0_a
Pelagic waters of the inner, middle, and outer continental shelf of the BS in summer and fall.

Early Juveniles (up to 4 years)—Level 0_a
Substrate (particularly areas of sand and mud) and lower portion of the water column on the inner and middle continental shelf of the BS.

Late Juveniles (4 to 7 years)—Level 1
Substrate (particularly areas of sand and mud) and lower portion of the water column on the inner, middle, and outer continental shelf of the BS. Feeding areas will be those containing polychaetes, amphipods, and echiurids. With increasing age, plaice overwinter near the edge of the shelf, and return to the middle and inner shelf for feeding in spring, summer, and fall.

Adults (7+ years)—Level 2
Substrate (particularly areas of sand and mud) and lower portion of the water column on the inner, middle, and outer continental shelf of the BS. Feeding areas will be those containing polychaetes, amphipods, and echiurids. Plaice overwinters near the edge of the shelf in the southeastern BS from the Pribilof islands to Unimak Island and north along the Alaskan Peninsula. Adults also occur across broad areas of the middle and inner shelf in summer and fall.

EFH Definition for BSAI Flathead Sole

Eggs (duration unknown)—Level 0_a
Pelagic waters of the middle and outer portions of the southeastern BS shelf, adjacent slope, and basin waters and throughout the AI in winter and early spring.

Larvae (duration unknown)—Level 0_a
Pelagic waters of the inner, middle, and outer portions of the southeastern BS shelf, adjacent slope, and basin waters and throughout the AI in spring and summer.

Early Juveniles (to 2 years old)—Level 0_a
Bottom substrate and lower water column on the inner, middle, and outer portions of the southeastern BS shelf and throughout the AI.

Late Juveniles (2 to 3 years old)—Level 1
Bottom substrate (particularly sand and mud) and lower portion of the water column on the inner, middle, and outer portions of the southeastern BS shelf south of 61° N and throughout the AI. Feeding areas would be those containing polychaetes, bivalves, ophiuroids, pollock, small tanner crab, and other crustaceans.

Adults (3+ years old)—Level 2
Bottom substrate (particularly sand and mud) and lower portion of the water column on the inner, middle, and outer portions of the southeastern BS shelf south of 61° N and throughout the AI. Feeding areas, primarily on the inner, middle, and outer shelf in spring, summer, and fall, are those containing polychaetes, bivalves, ophiuroids, pollock, small tanner crab, and other crustaceans. Spawning areas in winter and early spring are located primarily on the outer shelf.

EFH Definition for BSAI Sablefish

Eggs (duration 14 to 20 days)—Level 0_a
Pelagic waters of the upper and lower slope, and basin areas from 200 to 3,000 m from late winter to early spring (December through April) in the eastern BSAI.

Larvae (up to 3 months)—Level 0_a
Epipelagic waters of the middle and outer continental shelf, the slope, and basin areas in the eastern BSAI during late spring-early summer months (April through July).

Early Juveniles (up to 2 years)—Level 0_a
Pelagic waters, during the first summer, along the outer, middle, and inner continental shelf of the eastern BSAI and, after the first summer, areas of soft-bottom in nearshore bays and island passages until the end of the second summer.

Late Juveniles (2 to 5 years)—Level 1
Areas of soft bottom deeper than 200 m associated with the continental slope and deep shelf gulleys and fjords (presumably within the lower portion of the water column) of the eastern BSAI. Feeding areas are those containing mesopelagic and benthic fishes, benthic invertebrates, and jellyfish.

Adults (5+ years)—Level 2
Areas of soft bottom deeper than 200 m (presumably within the lower portion of the water column) associated with the continental slope and deep shelf gulleys in the eastern BSAI. Feeding areas would be those containing mesopelagic and benthic fishes, benthic invertebrates, and jellyfish. A large portion of the adult diet is comprised of gadid fishes, mainly pollock.

EFH Definition for BSAI Pacific Ocean Perch

Eggs (internal incubation, ~90 days)—No EFH Definition Determined
Internal fertilization and incubation. Incubation is assumed to occur during the winter months.

Larvae (duration 60 to 180 days)—Level 0_a
Pelagic waters of the inner, middle, and outer continental shelf, the upper and lower slope, and the basin areas of the BSAI during the spring and summer months.

Early Juveniles (larval stage to 3 years)—Level 0_a
Initially pelagic, then demersal in very rocky areas of the inner continental shelf of the BSAI. Includes the water column.

Late Juveniles (3 to 10 years)—Level 1
Areas of cobble, gravel, mud, and sand along the inner, middle, and outer continental shelf and upper slope areas, shallower than for adults, and the middle and lower portions of the water column of the BSAI regions. Feeding areas are those containing euphausiids.

Adults (10+ years)—Level 1
Areas of cobble, gravel, mud, and sand along the outer continental shelf and upper slope areas and middle and lower portions oft the water column of the BSAI. Feeding areas are those containing euphausiids. Areas of high concentrations tend to vary seasonally and may be related to spawning behavior. In summer, adults inhabit shallower depths (180 to 250 m), and in the fall, they migrate farther offshore (300 to 420 m).

EFH Definition for BSAI Pacific Ocean Perch Complex—Shortraker, and Rougheye Rockfish

Eggs—No EFH Definition Determined
Internal fertilization and incubation.

Larvae (duration unknown)—Level 0_b
Epipelagic waters of the inner, middle, and outer continental shelf, the upper and lower slope, and the basin areas of the BSAI during the spring and summer months.

Early Juveniles—Level 0_{a-b}
Pelagic waters and substrate on the entire continental shelf of the BSAI regions.

Late Juveniles—Level 0_b and Level 1
Areas shallower than for adults along the continental shelf of the BSAI regions. Juvenile shortraker rockfish have been seen only rarely.

Adults (15+ years)—Level 1
Areas of mud, sand, rock, cobble, and gravel and the lower portion of the water column on the outer continental shelf and upper slope of the BSAI. Fishery concentrations at 100 to 500 m. Feeding areas would be those areas where shrimps, squid, and myctophids occur.

EFH Definition for BSAI Pacific Ocean Perch Complex—Northern Rockfish

Eggs—No EFH Definition Determined
Internal fertilization and incubation.

Larvae—Level 0_b
Pelagic waters of the inner, middle, and outer continental shelf, the upper and lower slope, and the basin areas extending to the seaward boundary of the EEZ of the BSAI during the spring and summer months.

Early Juveniles (up to 25 centimeter [cm])—Level 0_b
Pelagic waters and substrate of the inner, middle, and outer continental shelf of the BSAI.

Late Juveniles (greater than 25 cm)—Level 1
Areas of cobble and rock along the shallower regions (relative to adults) of the outer continental shelf of the BSAI.

Adults (13+ years)—Level 1
Areas of cobble and rock along the outer continental slope and upper slope regions and the middle and lower portions of the water column of the BSAI. Areas of relatively shallow banks of the outer continental shelf have been found to have concentrated populations.

EFH Definition for BSAI Other Rockfish—Dusky Rockfish

Eggs—No EFH Definition Determined
Internal fertilization and incubation.

Larvae—Level 0_b
Pelagic waters of the inner, middle, and outer continental shelf, the upper and lower slope, and the basin areas extending to the seaward boundary of the EEZ of the BSAI during the spring and summer months.

Early Juveniles (up to 25 cm)—Level 0_b
Pelagic waters of the inner, middle, and outer continental shelf of the BSAI.

Juveniles (greater than 25 cm)—Level 0_a
Areas of cobble, rock, and gravel and the water column along the inner, middle, and outer continental shelf of the BSAI.

Adults (up to 50 years)—Level 1
Areas of cobble, rock, and gravel along the outer continental shelf and upper slope region and the middle and lower portions of the water column of the BSAI. Feeding areas are those containing euphausiids.

EFH Definition for BSAI Other Rockfish—Thornyhead Rockfish

Eggs—Level 0_a
Pelagic waters of the BSAI during the late winter and early spring.

Larvae (duration less than 15 months)—Level 0_a
Pelagic waters of the BSAI.

Juveniles (greater than 15 months)—Level 0_a
Areas of mud, sand, rock, cobble, and gravel and the lower portion of the water column along the middle and outer continental shelf and upper slope of the BSAI.

Adults (12+ years)—Level 1
Areas of mud, sand, rock, cobble, and gravel and the lower portion of the water column along the middle and outer continental shelf and upper and lower slope of the BSAI. Feeding areas are those containing shrimp, fish (cottids), and small crabs.

EFH Definition for BSAI Atka Mackerel

Eggs (duration 1 to 1.5 months)—Level 0_a
Areas of gravel, rock and kelp in shallow water in island passages, nearshore, and on the inner continental shelf in the AI and southeastern BS in areas of swift current in summer.

Larvae (duration 1.5 to 6 months)—Level 0_a
Epipelagic waters of the outer continental shelf of the southeastern BSAI, the Aleutian Basin (to the edge of the EEZ), and in the adjacent North Pacific Ocean (to the edge of the EEZ) in fall and winter.

Juveniles (up to 3 years)—Level 0_b
Unknown habitat association; assumed to settle near areas inhabited by adults, but have not been observed in fishery or surveys.

Adults (3+ years)—Level 2
Areas of gravel, rock, and kelp on the inner, middle, and outer portions of the shelf in the AI and the entire water column to the surface. Areas of gravel and rock on the outer portion of the shelf in the southeast BS and extending nearshore near the Pribilof Islands, including the entire water column. Feeding areas are those containing copepods, euphausiids and meso-pelagic fish (myctophids). Spawning occurs in nearshore (inner shelf and in island passages) rocky areas and in kelp in shallow waters in summer. BSAI Atka mackeral move to offshore deeper areas nearby in winter, and perform diurnal/tidal movements between demersal and pelagic areas.

EFH Definition for BSAI Other Species—Sculpins

Eggs—Level 0_a
All substrates on the inner, middle, and outer continental shelf of the eastern BSAI. Some species deposit eggs in rocky, shallow waters near shore.

Larvae—Level 0_a
Pelagic waters of the inner, middle, and outer continental shelf and slope of the eastern BSAI, predominately over the inner and middle shelf.

Juveniles—Level 0_a
Broad range of demersal habitats from intertidal pools, all shelf substrates (mud, sand, gravel, etc.), and rocky areas of the upper slope of the eastern BSAI.

Adults—Level 1
Broad range of demersal habitats from intertidal pools, all shelf substrates (mud, sand, gravel, etc.), and rocky areas of the upper slope of the eastern BSAI.

EFH Definition for BSAI Other Species—Skates

Eggs—Level 0_a
All bottom substrates of the slope and across the shelf throughout the eastern BSAI.

Larvae—No EFH Definition Determined
Not applicable (no larval stage)

Juveniles—Level 0_a
Broad range of substrate types (mud, sand, gravel, and rock) and the water column on the shelf and the upper slope of the eastern BSAI.

Adults—Level 1
Broad range of substrate types (mud, sand, gravel, and rock) and the lower portion of the water column on the shelf and the upper slope of the eastern BSAI.

EFH Definition for BSAI Other Species—Sharks

Eggs—No EFH Definition Determined
Not applicable (most are oviparous)

Larvae—No EFH Definition Determined
Not applicable (no larval stage).

Juveniles and Adults—Level 0_a
All waters and substrate types in the inner, middle, and outer continental shelf and slope of the BSAI.

EFH Definition for BSAI Other Species—Octopus

Eggs—Level 0_a
All bottom substrates of the shelf throughout the eastern BSAI.

Larvae—No EFH Definition Determined
Not applicable (no larval stage).

Juveniles and Adults—Level 0_a
Broad range of substrate types (mostly rock, gravel, and sand) and the lower portion of the water column on the shelf and the upper slope of the eastern BSAI. Feeding areas are those containing crustaceans and molluscs.

EFH Definition for BSAI Squid—Red Squid

Eggs—Level 0_a
Areas of mud and sand on the upper and lower slope throughout the eastern BSAI.

Larvae—No EFH Definition Determined
Not applicable (no larval stage).

Juveniles and Adults—Level 0_a
Pelagic waters of the shelf, slope, and basin to the seaward edge of the EEZ in the eastern BSAI. Feeding areas are those containing euphausiids, shrimp, forage fish, and other cephalopods.

EFH Definition for BSAI Forage Fish Complex—Eulachon

Eggs (duration 30 to 40 days)—Level 0_a
Bottom substrates of sand, gravel, and cobble in rivers from April through June.

Larvae (duration 1 to 2 months)—Level 0_a
Pelagic waters of the inner continental shelf throughout the BS.

Juveniles (to 3 years)—Level 0_a
Pelagic waters of the middle and outer continental shelf and upper slope throughout the BS.

Adults (3+ years)—Level 0_a
Pelagic waters of the middle to outer continental shelf and upper slope throughout the BS for non-spawning fishes (July through April). Feeding areas are those containing euphausiids and copepods. Rivers during spawning (April through June).

EFH Definition for BSAI Forage Fish Complex—Capelin

Eggs (duration 2 to 3 weeks)—Level 0_a
Sand and cobble intertidal beaches down to 10 m deep along the shores of the BS in Bristol Bay, Norton Sound, and along the northern shore of the Alaskan Peninsula from May through August.

Larvae (duration 4 to 8 months)—Level 0_a
Epipelagic waters of the inner and middle continental shelf throughout the BS.

Juveniles (1 to 2 yrs)—Level 0_a
Pelagic waters of the inner and middle continental shelf throughout the BS. Capelin juveniles may be associated with fronts and ice edges in winter.

Adults (2+ years)—Level 0_a
Pelagic waters of the inner, middle, and outer continental shelf throughout the BS during their non-spawning cycle (September through April). Populations are associated with fronts and the ice edge formed in winter and with intertidal beaches of sand and cobble down to 10 m deep during spawning (May through August).

EFH Definition for BSAI Forage Fish Complex—Sand Lance

Eggs (3 to 6 weeks)—Level 0_a
Bottom substrate of sand to sandy gravel along the inner continental shelf throughout the BS and the AI.

Larvae (100 to 131 days)—Level 0_a
Pelagic and neustonic waters along the inner continental shelf throughout the BS and the AI.

Juveniles—Level 0_a
Soft bottom substrates (i.e., sand, mud) and the entire water column of the inner and middle continental shelf throughout the BS and the AI. Feeding areas contain zooplankton, calanoid copepods, mysid shrimps crustacean larvae, gammarid amphipods, and chaetognaths.

Adults—Level 0_a
Soft bottom substrates (i.e., sand, mud) and the entire water column of the inner and middle continental shelf throughout the BS and the AI. Feeding areas contain zooplankton, calanoid copepods, mysid shrimps crustacean larvae, gammarid amphipods, and chaetognaths.

EFH Definition for BSAI Forage Fish Complex—Myctophids and Bathylagids

Eggs—Level 0_c—No EFH Definition Determined
No information available at this time.

Larvae—Level 0_c—No EFH Definition Determined
No information available at this time.

Juveniles—Level 0_a
Pelagic waters ranging from near surface to lower portion of the water column of the slope and basin regions throughout the BS, the AI, and to the seaward extent of the EEZ in the EBS and North Pacific Ocean.

Adults—Level 0_a
Pelagic waters ranging from near surface to lower portion of the water column of the slope and basin regions throughout the BS, the AI, and to the seaward extent of the EEZ in the EBS and North Pacific Ocean.

EFH Definition for BSAI Forage Fish Complex—Sand Fish

Eggs—Level 0_a
Egg masses attached to rock in nearshore areas throughout the BS and the AI.

Larvae—Level 0_c—No EFH Definition Determined
No information available at this time.

Juveniles—Level 0_a
Bottom substrates of mud and sand of the inner continental shelf throughout the BS and the AI.

Adults—Level 0_a
Bottom substrates of mud and sand of the inner continental shelf throughout the BS and the AI.

EFH Definition for BSAI Forage Fish Complex—Euphausiids

Eggs—Level 0_a
Neustonic waters throughout the BS, the AI, and to the seaward extent of the EEZ in the EBS and North Pacific Ocean in spring.

Larvae—Level 0_a

Epipelagic waters throughout the BS, the AI, and to the seaward extent of the EEZ in the EBS and North Pacific Ocean in spring.

Juveniles—Level 0_a

Pelagic waters throughout the BS, the AI, and to the seaward extent of the EEZ in the EBS and North Pacific Ocean. Dense populations are associated with upwelling or nutrient-rich areas, such as the edge of the continental shelf, heads of submarine canyons, edges of gullies on the continental shelf, in island passages along the AI, and over submerged seamounts.

Adults—Level 0_a
Pelagic waters throughout the BS, the AI, and to the seaward extent of the EEZ in the EBS and North Pacific Ocean. Dense populations are associated with upwelling or nutrient-rich areas, such as the edge of the continental shelf, heads of submarine canyons, edges of gullies on the continental shelf, in island passages along the AI, and over submerged seamounts.

EFH Definition for BSAI Forage Fish Complex—Pholids and Stichaeids

Eggs—Level 0_c—No EFH Definition Determined
No information available at this time.

Larvae—Level 0_c—No EFH Definition Determined
No information available at this time.

Juveniles—Level 0_a
Intertidal to demersal waters of the inner continental shelf with mud substrate throughout the BS and the AI. Certain species are associated with vegetation such as eelgrass and kelp.

Adults—Level 0_a
Intertidal to demersal waters of the inner continental shelf with mud substrate throughout the BS and the AI. Certain species are associated with vegetation such as eelgrass and kelp.

EFH Definition for BSAI Forage Fish Complex—Gonostomatids

Eggs—Level 0_c—No EFH Definition Determined
No information is available at this time.

Larvae—Level 0_c—No EFH Definition Determined
No information is available at this time.

Juveniles—Level 0_c—No EFH Definition Determined
No information is available at this time.

Adults—Level 0_a
Bathypelagic waters throughout the BS, AI, and to the seaward extent of the EEZ in the EBS and North Pacific Ocean.

D.2.1.3 EFH Map Descriptions for BSAI Groundfish
Figures D-2 through D-21 show EFH distributions under Alternative 2 for the BSAI groundfish species described in Section D.2.1.2.

D.2.2 Description of Essential Fish Habitat for the Groundfish Resources of the GOA Region

D.2.2.1 EFH Information Levels for GOA Groundfish

Species	Eggs	Larvae	Early Juveniles	Late Juveniles	Adults
Pollock	1	1	1	1	2
Pacific cod	0a	0a	0a	1	2
Shallow water flatfish					
Yellowfin sole	0a	0a	0a	1	2
Rock sole	0a	0a	0a	1	2
Deepwater flatfish	0a	0a	0a	0a	1
Arrowtooth flounder	0a	0a	0a	1	2
Rex sole	0a	0a	0a	0a	1
Flathead sole	0a	0a	0a	1	2
Sablefish	0a	0a	0a	1	2
Pacific ocean perch	-	0a	0a	1	1
Northern rockfish	-	0b	0b	1	1
Shortraker rockfish	-	0b	0a-b	0b	1
Rougheye rockfish	-	0b	0a-b	1	1
Yelloweye rockfish	-	0b	0a	1	1
Pelagic shelf rockfish					
Dusky rockfish	-	0b	0b	0a	1
Thornyhead rockfish	0a	0a	0a	0a	1
Atka mackerel	0a	0a	0a	0a	1
Other species					
sculpins	0a	0a	0a	0a	1
skates	0a	-	0a	0a	1
sharks	-	-	0a	0a	0a
octopus	0a	-	0a	0a	0a
squid	0a	-	0a	0a	0a
Forage Fish species					
smelts	0a	0a	0a	0a	0a
other forage fish	0	0	0	0	0

D.2.2.2 EFH Text Descriptions for GOA Groundfish

<u>EFH Definition for GOA Walleye Pollock</u>

Eggs (duration to 14 days)—Level 1
Pelagic waters along the inner, middle, and outer continental shelf and the upper slope in the GOA from Dixon Entrance to 170° W. Spawning concentrations occur in Shelikof Strait (late March), in the Shumagin Islands (early March), the east side of Kodiak Island, and near Prince William Sound. Oceanographic features that eggs may be associated with are gyres.

Larvae (duration 14 to 60 days)—Level 1
Epipelagic waters of the water column along the middle and outer continental shelf in the GOA from Dixon Entrance to 170° W. Feeding areas are those that contain copepod, naupli, and small euphausiids. Oceanographic features that larvae may be associated with are gyres and fronts.

Juveniles (4 to 4.5 years)—Level 1
Pelagic waters along the inner, mid, and outer continental shelf in the GOA from Dixon Entrance to 170° W. Feeding areas are those that contain pelagic crustaceans, copepods, and euphausiids. Oceanographic features that juveniles may be associated with are fronts and the thermocline.

Adults (4.5+ years)—Level 2
Pelagic waters from 70 to 200 m along the outer continental shelf and basin in the GOA from Dixon Entrance to 170° W. Feeding areas are those that contain pelagic crustaceans and fish. Oceanographic features that adults are associated with are fronts and upwelling. Spawning concentrations occur in Shelikof Strait, in the Shumagin Islands, along the east side of Kodiak Island, and near Prince William Sound in late winter. The greatest abundance occurs in the GOA between 147° W to 170° W at depths less than 300 m.

EFH Definition for GOA Pacific Cod

Eggs (duration 15 to 20 days)—Level 0_a
Areas of mud, sandy mud, muddy sand, and sand along the inner, middle, and outer continental shelf of the GOA from Dixon Entrance to 170° W in winter and spring.

Larvae (duration unknown)—Level 0_a
Epipelagic waters of the GOA from Dixon Entrance to 170° W in winter and spring.

Early Juveniles(up to 2 years)—Level 0_a
Areas of mud, sandy mud, muddy sand, and sand along the inner and middle continental shelf and the lower portion of the water column of the GOA from Dixon Entrance to 170° W. Feeding areas are those containing small invertebrates (e.g., mysids, euphausiids, and shrimp).

Late Juveniles (2 to 5 years)—Level 1
Areas of mud, sandy mud, muddy sand, and sand along the inner and middle continental shelf and the lower portion of the water column of the GOA from Dixon Entrance to 170° W. Feeding areas are those containing pollock, flatfish, and crab.

Adults (5+ years)—Level 2
Areas of mud, sandy mud, muddy sand, and sand along the inner, middle, and outer continental shelf up to 500 m and the lower portion of the water column of the GOA from Dixon Entrance to 170° W. Feeding areas are those containing pollock, flatfish, and crab. Spawning occurs from January through May.

EFH Definition for GOA Deep Water Flatfish—Dover Sole

Eggs—Level 0_a
Pelagic waters along the inner, middle, and outer continental shelf of the GOA from Dixon Entrance to 170° W during spring and summer.

Larvae (duration up to 2 years)—Level 0_a
Pelagic waters along the inner, middle, and outer continental shelf and upper slope of the GOA from Dixon Entrance to 170° W.

Early Juveniles (up to 3 years)—Level 0_a
Areas of sand and mud along the inner and middle continental slope and the lower portion of the water column of the GOA from Dixon Entrance to 170° W. Feeding areas are those containing polychaetes, amphipods, and annelids.

Late Juveniles (3 to 5 years)—Level 0_a
Areas of sand and mud along the inner and middle continental slope and the lower portion of the water column of the GOA from Dixon Entrance to 170° W. Feeding areas are those containing polychaetes, amphipods, and annelids.

Adults (5+ years)—Level 1
Areas of sand and mud along the middle to outer continental shelf and upper slope deeper than 300 m and the lower portion of the water column of the GOA from Dixon Entrance to 170° W. Winter and spring spawning and summer feeding occur on soft substrates (sand and mud) of the continental shelf and upper slope and a shallower summer distribution occurs mainly on the middle to outer portion of the shelf and upper slope. Feeding areas are those containing polychaetes, amphipods, annelids, and mollusks.

EFH Definition for GOA Shallow Water Complex—Yellowfin Sole

Eggs (duration unknown)—Level 0_a
Pelagic inshore waters of the central and western GOA during summer months.

Larvae (duration 2 to 3 months)—Level 0_a
Pelagic inshore waters and inner continental shelf regions of the central and western GOA during summer and autumn months.

Early Juveniles (to 5.5 years old)—Level 0_a
Demersal areas (bottom and lower portion of the water column) on the inner, middle, and outer portions of the continental shelf (down to 250 m) and within nearshore bays of the central and western GOA.

Late Juveniles (5.5 to 9 years old)—Level 1
Areas of sandy bottom along with the lower portion of the water column within nearshore bays and on the inner, middle, and outer portions of the continental shelf (down to 250 m) of the central and western GOA. Feeding areas would be those containing polychaetes, bivalves, amphipods, and echiurids.

Adults (9+ years old)—Level 2
Areas of sandy bottom along with the lower portion of the water column on the inner, middle, and outer portions of the continental shelf (down to 250 m) of the central and western GOA. Areas of known concentrations vary seasonally (known for the EBS). Adult spawning areas are known for the BS (see EBS EFH definition). Summer (June through October) feeding concentrations of adults occur in the EBS. Feeding areas would be those containing polychaetes, bivalves, amphipods, and echiurids. In winter, yellowfin sole adults migrate to deeper waters of the shelf (100 to 200 m) south of 60° N to the Alaskan Peninsula.

EFH Definition for GOA Shallow Water Complex—Rock Sole

Eggs (duration unknown)—Level 0_a
Areas of pebbles and sand at depths from 125 to 250 m in winter (December through March) along the shelf-slope break in the GOA from Dixon Entrance to 170° W.

Larvae (duration 2 to 3 months)—Level 0_a
Pelagic waters of the GOA from Dixon Entrance to 170° W over the inner, middle, and outer portions of the continental shelf and the slope.

Early Juveniles (to 3.5 years old)—Level 0_a
Inner, middle, and outer portions of the continental shelf (down to 250 m) of the GOA and the lower portion of the water column from Dixon Entrance to 170° W. Feeding areas would be those containing polychaetes, bivalves, amphipods, and crustaceans.

Late Juveniles (3.5 to 8 years old)—Level 1
Areas of pebbles and sand and the lower portion of the water column within nearshore bays and on the inner, middle, and outer portions of the continental shelf (down to 250 m) of the GOA from Dixon Entrance to 170° W. Feeding areas would be those containing polychaetes, bivalves, amphipods, and crustaceans.

Adults (8+ years old)—Level 2
Areas of pebbles and sand and the lower portion of the water column on the inner, middle, and outer portions of the continental shelf (down to 250 m) of the GOA from Dixon Entrance to 170° W. Areas of known concentrations vary seasonally and include adult spawning areas in winter (see Eggs) and feeding areas in summer (May through October) in the EBS (see BSAI EFH definition). Feeding areas would be those containing polychaetes, bivalves, amphipods, and crustaceans.

EFH Definition for GOA Rex Sole

Eggs—Level 0_a
Pelagic waters of the inner, middle, and outer continental shelf of the GOA from Dixon Entrance to 170° W from February through July.

Larvae—Level 0_a
Pelagic waters of the inner, middle, and outer continental shelf of the GOA from Dixon Entrance to 170° W during the spring and summer months.

Juveniles (up to 2 years)—Level 0_a
Areas of gravel, sand, and mud along the inner, middle, and outer continental shelf deeper than 300 m, and the lower portion of the water column of the GOA from Dixon Entrance to 170° W. Feeding areas are those containing polychaetes, amphipods, euphausiids, and Tanner crab.

Adults (2+ years)—Level 1
Areas of gravel, sand, and mud along the inner, middle, and outer continental shelf deeper than 300 m, and the lower portion of the water column of the GOA from Dixon Entrance to 170° W. Feeding areas are those containing polychaetes, amphipods, euphausiids, and Tanner crab. Spawning occurs from February through July along areas of sand, mud, and gravel substrates of the continental shelf.

EFH Definition for GOA Flathead Sole

Eggs (duration unknown)—Level 0_a
Pelagic waters (January through April) along the inner, middle, and outer continental shelf in the GOA from Dixon Entrance to 170° W.

Larvae (duration unknown)—Level 0_a
Pelagic waters along the inner, middle, and outer continental shelf of the GOA from Dixon Entrance to 170° W. Feeding areas are those containing phytoplankton and zooplankton.

Juveniles (2 to 3 years)—Level 1
Areas of sand and mud along the inner, middle, and outer continental shelf and upper slope and the lower portion of the water column in the GOA from Dixon Entrance to 170° W. Feeding areas are those containing polychaetes, bivalves, ophiuroids, pollock, and small tanner crab.

Adults (3+ years)—Level 2
Areas of sand and mud along the inner, middle, and outer continental shelf and upper slope and the lower portion of the water column in the GOA from Dixon Entrance to 170° W. Feeding areas, primarily on the inner, middle, and outer shelf in spring, summer and fall, are those containing polychaetes, bivalves, ophiuroids, pollock, small tanner crab, and other crustaceans. Spawning areas in winter and early spring are located primarily on the outer shelf.

EFH Definition for GOA Arrowtooth Flounder

Eggs (duration unknown)—Level 0_a
Pelagic waters (November through March) along the inner, middle, and outer continental shelf in the GOA from Dixon Entrance to 170° W.

Larvae (duration 2 to 3 months)—Level 0_a
Pelagic waters along the inner and outer continental shelf and nearshore bays during spring and summer in the GOA from Dixon Entrance to 170° W. Feeding areas are those that contain phytoplankton and zooplankton.

Early Juveniles (to 2 years old)—Level 0_a
Areas of gravel, mud, and sand and the water column of the inner continental shelf and adjacent nearshore bays in the GOA from Dixon Entrance to 170° W.

Late Juveniles (1 to 4 years)—Level 1
Areas of gravel, mud, and sand along the inner, middle, and outer continental shelf and upper slope and the lower portion of the water column in the GOA from Dixon Entrance to 170° W. Feeding areas are those that contain euphausiids, crustaceans, amphipods, and pollock.

Adults (4+ years)—Level 2
Areas of gravel, mud, and sand along the inner, middle, and outer continental shelf, upper slope and nearshore bays and the lower portion of the water column in the GOA from Dixon Entrance to 170° W. Summer feeding areas on the middle and outer shelf would be those containing gadids, euphausiids, and other fish. Spawning areas in winter are on the outer shelf and upper slope regions.

EFH Definition for GOA Sablefish

Eggs (duration 14 to 20 days)—Level 0_a
Pelagic waters of the continental shelf and in basin areas from 200 to 3,000 m extending to the seaward boundaries of the EEZ of the GOA from Dixon Entrance to 170° W from late winter to early spring (December to April).

Larvae (duration up to 3 months)—Level 0_a
Epipelagic waters of the middle to outer continental shelf and the slope and basin areas of the GOA from Dixon Entrance to 170° W during late spring and early summer months (April through July).

Early Juveniles (up to 2 years)—Level 0_a
During the first summer, Pelagic waters along the outer, middle, and inner continental shelf of the GOA from Dixon Entrance to 170 ° W. After the first summer until the end of the second summer, early juveniles use areas of soft-bottom in nearshore bays and island passages in the demersal and semi-demersal regions.

Late Juveniles (2 to 5 years)—Level 1
Areas of soft bottom generally deeper than 100 m and associated with the continental slope and deep shelf gulleys and fjords (presumably demersal within the lower portion of the water column) of the GOA from Dixon Entrance to 170° W. Feeding areas are those containing mesopelagic and benthic fishes, benthic invertebrates, and jellyfish.

Adults (5+ years)—Level 2
Areas of soft bottom deeper than 200 m (presumably within the lower portion of the water column) associated with the continental slope and deep shelf gulleys and fjords (such as Prince William Sound and those in southeastern Alaska) of the GOA from Dixon Entrance to 170° W. Feeding areas would be those containing mesopelagic and benthic fishes, benthic invertebrates, and jellyfish. A large portion of the adult diet is comprised of gadid fishes, mainly pollock.

EFH Definition for GOA Slope Rockfish—Pacific Ocean Perch

Eggs (internal incubation, ~90 days)—No EFH Definition Determined
Infernal fertilization and incubation. Incubation is assumed to occur during the winter months.

Larvae (duration 60 to 180 days)—Level 0_a
Pelagic waters of the inner, middle, and outer continental shelf, the upper and lower slope, and the basin areas extending to the seaward boundary of the EEZ of the GOA from Dixon Entrance to 170° W during the spring and summer months.

Early Juveniles (larval stage to 3 years)—Level 0_a
Initially pelagic, then demersal in very rocky areas of the inner continental shelf of the GOA from Dixon Entrance to 170° W.

Late Juveniles (3 to 10 years)—Level 1
Areas of cobble, gravel, mud, sandy mud, and muddy sand along the inner, middle, and outer continental shelf and upper slope areas. Late juveniles occur shallower than adults, in the middle to lower portion of the water column of the GOA from Dixon Entrance to 170° W. Feeding areas are those containing euphausiids.

Adults (10+ years)—Level 1
Areas of cobble, gravel, mud, sandy mud or muddy sand along the outer continental shelf and upper slope areas from 180 to 420 m (actual depths sampled) of the GOA from Dixon Entrance to 170° W. Feeding areas are those containing euphausiids. Areas of high concentrations tend to vary seasonally and may be related to spawning behavior. In summer, adults inhabit shallower depths (180 to 250 m), and in the fall, they migrate farther offshore (300 to 420 m).

EFH Definition for GOA Slope Rockfish—Shortraker and Rougheye Rockfish

Eggs—No EFH Definition Determined
Internal fertilization and incubation.

Larvae—Level 0_b
Pelagic waters of the inner, middle, and outer continental shelf, the upper and lower slope, and the basin areas extending to the seaward boundary of the EEZ of the GOA from Dixon Entrance to 170° W during the spring and summer months.

Early Juveniles (up to 20 cm)—Level 0_{a-b}
Between nearshore waters and outer continental shelf of the GOA from Dixon Entrance to 170° W.

Late Juveniles (greater than 20 cm)—Level 0_b and Level 1
Areas shallower than adult along the continental shelf of the GOA (includes substrate and water column) from Dixon Entrance to 170° W. Juvenile shortraker rockfish have been observed on only a few rare occasions. Presence is presumed somewhere between nearshore and outer continental shelf between Dixon Entrance and 170° W.

Adults (15+ years)—Level 1
Areas of mud, sand, rock, sandy mud, cobble, muddy sand, and gravel at depths ranging from 200 to 500 m and the lower third of the water column of the outer continental shelf and the upper slope of the GOA from Dixon Entrance to 170° W. Fishery concentrations are at 300 to 500 m. Feeding areas would be those areas where shrimps, squid, and myctophids occur.

EFH Definition for GOA Slope Rockfish—Northern Rockfish

Eggs—No EFH Definition Determined
Internal fertilization and incubation.

Larvae—Level 0_b
Pelagic waters of the inner, middle, and outer continental shelf, the upper and lower slope, and the basin areas extending to the seaward boundary of the EEZ of the GOA from Dixon Entrance to 170° W during the spring and summer months.

Early Juveniles (up to 25 cm)—Level 0_b
Pelagic waters of the inner, middle, and outer continental slope of the GOA from Dixon Entrance to 170° W.

Late Juveniles (greater than 25 cm)—Level 1
Areas of cobble and rock along the shallower regions (relative to adults) of the outer continental shelf and the middle and lower portions of the water column of the GOA from Dixon Entrance to 170° W.

Adults (13+ years)—Level 1
Areas of cobble and rock along the outer continental slope and upper slope regions and the middle and lower portion of the water column of the GOA from Dixon Entrance to 170° W. Areas of relatively shallow banks of the outer continental shelf have been found to have concentrated populations.

EFH Definition for GOA Pelagic Shelf Rockfish—Dusky Rockfish

Eggs—No EFH Definition Determined
Internal fertilization and incubation.

Larvae—Level 0_b
Pelagic waters of the inner, middle, and outer continental shelf, the upper and lower slope, and the basin areas extending to the seaward boundary of the EEZ of the GOA from Dixon Entrance to 170° W during the spring and summer months.

Early Juveniles (less than 25 cm)—Level 0_b
Pelagic waters of the inner, middle, and outer continental shelf of the GOA from Dixon Entrance to 170° W.

Late Juveniles (greater than 25 cm)—Level 0_a
Areas of cobble, rock, and gravel along the inner, middle, and outer continental shelf of the GOA from Dixon Entrance to 170° W. Location in water column is currently unknown.

Adults (up to 50 years)—Level 1
Areas of cobble, rock, and gravel along the outer continental shelf and upper slope region and the middle to lower portion of the water column of the GOA from Dixon Entrance to 170° W. Feeding areas are those containing euphausiids. Also found in nearshore waters of Southeast Alaska along rocky shores at depths less than 50 m.

EFH Definition for GOA Demersal Shelf Rockfish—Yelloweye Rockfish

Eggs—No EFH Definition Determined
Internal fertilization and incubation.

Larvae (less than 6 months)—Level 0_b
Epipelagic areas of the water column of the GOA from Dixon Entrance to 170° W during the spring and summer months.

Early Juveniles (to 10 years)—Level 0_a
Areas of rock and coral along the inner, middle, and outer continental shelf, bays, island passages, and the entire water column of the GOA from Dixon Entrance to 170° W. Concentrations of young juveniles (2.5 to 10 cm) have been observed in areas of high relief (such as vertical walls, cloud sponges, and fjord-like areas).

Late Juveniles (10 to 18 yrs)—Level 1
Areas of rock and coral along the inner, middle, and outer continental shelf, nearshore bays, and island passages of the GOA from Dixon Entrance to 170° W and the lower portion of the water column. High concentrations are found associated with high relief with refuge spaces such as overhangs, crevices, and caves.

Adults (18+ years)—Level 1
Areas of rock, coral, and cobble along the inner, middle, and outer continental shelf, upper slope, nearshore bays, and island passages of the GOA from Dixon Entrance to 170° W from and the lower portion of the water column. High concentrations are found associated with high relief containing refuge spaces such as overhangs, crevices, and caves. Feeding areas are those containing fish, shrimp, and crab.

EFH Definition for GOA Thornyhead Rockfish

Eggs—Level 0_a
Pelagic waters of the GOA from Dixon Entrance to 170° W during the late winter and early spring.

Larvae (less than 15months)—Level 0_a
Pelagic waters extending to the seaward boundary of the EEZ of the GOA from Dixon Entrance to 170° W during the early spring through summer.

Juveniles (more than 15 months)—Level 0_a
Areas of mud, sand, rock, sandy mud, cobble, muddy sand, and gravel and the lower portion of the water column along the middle and outer continental shelf and upper slope of the GOA from Dixon Entrance to 170° W.

Adults—Level 1
Areas of mud, sand, rock, sandy mud, cobble, muddy sand, and gravel and the lower portion of the water column along the middle and outer continental shelf and upper and lower slope of the GOA from Dixon Entrance to 170° W. Feeding areas are those containing shrimp, fish (cottids), and small crabs.

EFH Definition for GOA Atka Mackerel

Eggs (40 to 45 days)—Level 0_a
Areas of gravel, rock, and kelp in shallow waters, island passages, and the inner continental shelf of the GOA from Kodiak Island to 170° W.

Larvae (up to 6 months)—Level 0_a
Epipelagic waters of the middle and outer continental shelf and slope and extending seaward to the edge of the EEZ in the GOA from Kodiak Island to 170° W.

Juveniles (up to 2 years)—Level 0_a
Unknown habitat association; assumed to settle near areas inhabited by adults, but have not been observed in fishery or surveys.

Adults—Level 1
Areas of gravel, rock, and kelp on the inner, middle, and outer continental shelf and the entire water column (to the surface) in the GOA from Kodiak Island to 170° W. Feeding areas are those containing copepods, euphausiids, and meso-pelagic fish (myctophids). Spawning occurs in nearshore (inner shelf and in island passages) rocky areas and in kelp in shallow waters in summer and early fall. Atka mackeral move to deep offshore areas nearby in winter and perform diurnal/tidal movements between demersal and pelagic areas.

EFH Definition for GOA Other Species—Sculpins

Eggs—Level 0_a
All substrate types on the inner, middle, and outer continental shelf of the GOA from Dixon Entrance to 170° W. Some species deposit eggs in rocky shallow waters near shore.

Larvae—Level 0_a
Pelagic waters of the inner, middle, and outer continental shelf and slope of the GOA from Dixon Entrance to 170° W, predominately over the inner and middle shelf.

Juveniles—Level 0_a
Broad range of demersal habitats from intertidal pools, all shelf substrates (mud, sand, gravel, etc.), and rocky areas of the upper slope of the GOA from Dixon Entrance to 170° W.

Adults—Level 1
Broad range of demersal habitats from intertidal pools, all shelf substrates (mud, sand, gravel, etc.), and rocky areas of the upper slope of the GOA from Dixon Entrance to 170° W.

EFH Definition for GOA Other Species—Skates

Eggs—Level 0_a
All bottom substrates of the upper slope and across the shelf throughout the GOA from Dixon Entrance to 170° W.

Larvae—No EFH Definition Determined
Not applicable (no larval stage).

Juveniles—Level 0_a
Broad range of substrate types (mud, sand, gravel, and rock) and the water column on the shelf and the upper slope of the GOA from Dixon Entrance to 170° W.

Adults—Level 1
Broad range of substrate types (mud, sand, gravel, and rock) and the lower portion of the water column on the shelf and the upper slope of the GOA from Dixon Entrance to 170° W.

EFH Definition for GOA Other Species—Sharks

Eggs—No EFH Definition Determined
Not applicable (most are oviparous).

Larvae—No EFH Definition Determined
Not applicable (most species are oviparous/ no larval stage).

Juveniles and Adults—Level 0_a
All waters and substrate types in the inner, middle, and outer continental shelf and slope of the GOA from Dixon Entrance to 170° W to the seaward edge of the EEZ.

EFH Definition for GOA Other Species—Octopus

Eggs—Level 0_a
All bottom substrates of the shelf throughout the GOA from Dixon Entrance to 170° W.

Larvae—No EFH Definition Determined
Not applicable (no larval stage).

Juveniles and Adults—Level 0_a
Broad range of substrate types (mostly rock, gravel, and sand) and the lower portion of the water column on the shelf and the upper slope of the GOA from Dixon Entrance to 170° W. Feeding areas are those containing crustaceans and molluscs.

EFH Definition for GOA Squid—Red Squid

Eggs—Level 0_a
Areas of mud and sand on the upper and lower slope GOA from Dixon Entrance to 170° W.

Larvae—No EFH Definition Determined
Not applicable (no larval stage).

Juveniles and Adults—Level 0_a
Pelagic waters of the shelf, slope, and basin to the seaward edge of the EEZ in the GOA from Dixon Entrance to 170° W. Feeding areas are those containing euphausiids, shrimp, forage fish, and other cephalopods.

D.2.2.3 EFH Map Descriptions for GOA Groundfish

Figures D-22 through D-42 show EFH distribution under Alternative 2 for the GOA groundfish species as described in Section D.2.2.2.

D.2.3 Description of Essential Fish Habitat for BSAI King and Tanner Crab

D.2.3.1 EFH Information Levels for BSAI Crab

Species/Stock	Eggs	Larvae	Early Juveniles[1]	Late Juveniles[2]	Adults
Red King Crab					
Bristol Bay	2	2	1	2	2
Pribilof Islands	2	1	0c	2	2
Norton Sound	2	0c	0c	2	2
Dutch Harbor	2	0c	0c	2	2
Adak	1	0c	0c	0c	1
Blue King Crab					
Pribilof Islands	2	1	2	2	2
St. Matthew I.	1	0c	0c	1	2
St. Lawrence I.	0b	0c	0c	0c	1
Golden King Crab					
Seaguam Pass	2	0c	0c	2	2
Adak	1	0c	0c	1	2
Pribilof Islands	1	0c	0c	1	2
Northern District	0c	0c	0c	0c	0c
Scarlet King Crab					
EBS	0b	0c	0c	0c	1
Adak	0b	0c	0c	0c	1
Dutch Harbor	0b	0c	0c	0c	1
Tanner Crab (C. bairdi)					
Bristol Bay	2	1	1	2	2
Pribilof Islands	2	1	1	2	2
Eastern Aleutians	1	0c	1	2	2
Western Aleutians	0b	0c	0c	0c	1
Snow Crab (C. Opilio)					
BS	2	1	1	2	2
Grooved Crab (C. tanneri)					
EBS	0b	0c	0c	0c	1
Eastern Aleutians	0b	0c	0c	0c	1
Western Aleutians	0b	0c	0c	0c	1
Triangle Crab (C. angulatus)					
Bristol Bay	1	0c	0c	0c	1
Eastern Aleutians	1	0c	0c	0c	1

[1] Early juvenile crab are defined as settled crab up to a size approximating age 2.
[2] Late juvenile crab are defined as age 2 through the first size of functional maturity.
0a: For any crab species/stock's life stage at Level 0, information was insufficient to infer general distribution
0b: No information on the life stage is available, but some information exists on a similar species or adjacent

D.2.3.2 EFH Text Descriptions for BSAI Crab

EFH Definition for Red King Crab

Eggs—Level 1 & 2
Egg hatch of larvae is synchronized with the spring phytoplankton bloom in Southeast Alaska, suggesting temporal sensitivity in the transition from benthic to planktonic habitat. Essential habitat of the red king crab egg stage is based on the general distribution (Level 1) and habitat-related density (level 2) of egg-bearing red king crabs of the Bristol Bay, Pribilof Islands, Norton Sound, and Dutch Harbor stocks. General distribution (Level 1) of egg-bearing female red king crab is used to identify essential habitat for the Adak stock. (See also Adults.)

Larvae—Level 0_c, Levels 1 and Level 2 (no EFH definition determined for the Norton Sound, Dutch Harbor, and Adak stocks)
Red king crab larvae spend 2 to 3 months in pelagic larval stages before settling to the benthic life stage. Reverse diel migration and feeding patterns of larvae coincide with the distribution of food sources. Essential habitat is identified for larvae of the Bristol Bay red king crab stock using the general distribution (Level 1) and density (Level 2) of larvae in the water column. Essential habitat is defined for larvae of the Pribilof Islands stock based on knowledge of the general distribution (Level 1) of larvae in the water column. No essential habitat is defined for larvae of red king crab stocks in Norton Sound, Dutch Harbor, and Adak waters.

Early Juveniles—Levels 0_c and 1 (no EFH definition determined for the Northern District stock)
Early juvenile stage red king crabs are solitary and need high relief habitat or coarse substrate such as boulders, cobble, shell hash, and living substrates such as bryozoans and stalked ascidians. Young-of-the-year crabs occur at depths of 50 m or less. Essential habitat for early juveniles is defined for Bristol Bay red king crabs as the general distribution (Level 1). No essential fish habitat is defined for red king crab early juveniles in Pribilof Islands, Norton Sound, Dutch Harbor, and Adak stocks.

Late Juveniles—Levels 0_c and 2 (no EFH definition determined for the Adak stock)
Late juvenile stage red king crabs from 2 to 4 years exhibit decreasing reliance on habitat and a tendency for the crab to form pods consisting of thousands of crabs. Podding generally continues until 4 years of age (about 6.5 cm), when the crab move to deeper water and join adults in the spring migration to shallow water for molting and mating. Essential habitat based on general distribution (Level 1) and density (Level 2) of late juvenile red king crabs is known for Bristol Bay, Pribilof Islands, Norton Sound, and Dutch Harbor stocks. Essential habitat is not defined for late juvenile red king crabs in the Adak stock.

Adults—Levels 1 and 2
Mature red king crabs exhibit seasonal migration to shallow waters for reproduction. During the remainder of the year, red king crabs are found in deep waters. In Bristol Bay, red king crabs mate when they enter shallower waters (less than 50 m), generally beginning in January and continuing through June. Males grasp females just prior to female molting, after which the eggs (43,000 to 500,000 eggs) are fertilized and extruded on the female's abdomen. The female red king crab carries the eggs for 11 months before they hatch, generally in April. Essential habitat for mature red king crabs is known for Bristol Bay, Pribilof Islands, Norton Sound, and Dutch Harbor stocks based on general distribution (Level 1) and density (Level 2). Essential habitat for mature red king crabs in Adak is known from general distribution data (Level 1).

EFH Definition for Blue King Crab

Eggs—Levels 0_b, 1, and 2
Essential habitat for eggs is known for the stock of blue king crab in the Pribilof Islands based on general distribution (Level 1) and density (Level 2) of egg-bearing female crabs. Essential habitat for eggs of the St. Matthew Island blue king crab stock is based on general distribution (Level 1) of the egg-bearing females. Essential habitat for eggs of the St. Lawrence Island blue king crab stock is inferred from incidental catch of mature female crab. (See also Adults.)

Larvae—Levels 0_c and 1 (no EFH definition determined for the St. Matthew Island and St. Lawrence stocks)
Blue king crab larvae spend 3.5 to 4 months in pelagic larval stages before settling to the benthic life stage. Larvae are found in waters of depths between 40 to 60 m. Essential habitat of larval blue king crab of the Pribilof Islands stock is defined using the general distribution (Level 1) of larvae in the water column. Information to define essential habitat is not available for the St. Matthew Island and St. Lawrence Island stocks of larval blue king crab.

Early Juveniles—Levels 0_c and 2 (no EFH definition determined for the St. Matthew and St. Lawrence Island stocks)
Early juvenile blue king crabs require refuge substrate characterized by gravel and cobble overlaid with shell hash and sponge, hydroid, and barnacle assemblages. These habitat areas have been found at 40 to 60 m around the Pribilof Islands. Essential habitat of early juvenile blue king crabs is based on general distribution (Level 1) and density (Level 2) of this life stage in the Pribilof Island stock. Information to define essential habitat for early juvenile blue king crabs in the St. Matthew Island and St. Lawrence Island stocks is not available.

Late Juveniles—Levels 0_c, 1 and 2 (no EFH definition determined for the St. Lawrence Island stock)
Late juvenile blue king crab require nearshore rocky habitat with shell hash. Essential habitat is based on general distribution (Level 1) and density (Level 2) of late juvenile blue king crab of the Priblilof Islands stock. General distribution (Level 1) of the late juvenile blue king crabs is used to identify essential habitat for the St. Matthew Island stock. Information is not available to define essential habitat for the St. Lawrence Island stock of late juvenile blue king crab.

Adults—Levels 1 and 2
Mature blue king crabs occur most often between 45 and 75 m depth on mud-sand substrate adjacent to gravel rocky bottom. Female crabs are found in a habitat with a high percentage of shell hash. Mating occurs in mid-spring. Larger, older females reproduce biennially while small females tend to reproduce annually. Fecundity of females range from 50,000 to 200,000 eggs per female. It has been suggested that spawning may depend on availability of nearshore rocky-cobble substrate for protection of females. Larger, older crabs disperse farther offshore and are thought to migrate inshore for molting and mating. General distribution (Level 1) and density (Level 2) of mature blue king crab are used to identify essential habitat for the Pribilof Islands and St. Matthew Island stocks. Essential habitat of mature blue king crab is based on distribution (Level 1) data for the St. Lawrence Island stock.

EFH Definition for Golden King Crab

Eggs—Levels 0_c, 1 and 2 (no EFH definition determined for the Northern District stock)
General distribution (Level 1) and density (Level 2) of egg-bearing female golden king crabs is used to identify essential habitat for the Sequam Pass stock. Essential habitat for the egg life stage of the Adak and Priblilof Islands stocks is based on general distribution (Level 1) of the egg-bearing female crabs. (See also Adults.)

Larvae—Level 0_c (no EFH definition determined)
Information to define essential habitat of golden king crab larvae is not available for the Seguam Pass, Adak, Pribilof Islands, or Northern District stocks.

Early Juveniles—Level 0_c (no EFH definition determined)
Information to define essential habitat of early juvenile golden king crabs is not available for the Seguam Pass, Adak, Pribilof Islands, or Northern District stocks.

Late Juveniles—Levels 0_c, 1 and 2 (no EFH definition determined for the Northern District stock)
Late juvenile golden king crabs are found throughout the depth range of the species. Abundance of late juvenile crab increases with depth and these crab are most abundant at depths greater than 548 m. Essential habitat for late juvenile golden king crabs is based on general distribution (Level 1) and density (Level 2) of this life stage for the Sequam Pass stock. General distribution (Level 1) of late juvenile golden king crabs is used to identify essential habitat for the Adak and Pribilof Islands stock. Information to define essential habitat is not available for late juvenile golden king crabs of the Northern District stock.

Adults—Levels 0_c and 2 (no EFH definition determined for the Northern District stock)
Mature golden king crabs occur at all depths within their distribution. Males tend to congregate in somewhat shallower waters than females, and this segregation appears to be maintained throughout the year. Legal male crabs are most abundant between 274 m and 639 m. Abundance of sub-legal males increases at depth greater than 364 m. Female abundance is greatest at intermediate depths between 274 m and 364 m. General distribution (Level 1) and density (Level 2) of mature golden king crabs are used to identify essential habitat for the Sequam Pass, Adak, and Pribilof Islands stocks. Information is not available to define essential habitat for mature golden king crabs of the Northern District stock.

EFH Definition for Scarlet King Crab

Eggs—Level 0_b
Information for scarlet king crab eggs is not available for the EBS, Adak, or Dutch Harbor stocks. General distribution of the egg life stage is inferred from incidental catch of mature females. (See also Adults.)

Larvae—Level 0_c (no EFH definition determined)
Information to define essential habitat for scarlet king crab larvae is not available for the EBS, Adak, or Dutch Harbor stocks.

Early Juveniles—Level 0_c (no EFH definition determined)
Information to define essential habitat for early juvenile scarlet king crabs is not available for the EBS, Adak, or Dutch Harbor stocks.

Late Juveniles—Level 0_c (no EFH definition determined)
Information to define essential habitat for late juvenile scarlet king crabs is not available for the EBS, Adak, or Dutch Harbor stocks.

Adults—Level 1
Essential habitat for mature scarlet king crabs is based on the general distribution (Level 1) of mature golden king crabs. Mature scarlet king crabs are caught incidentally in the golden king crab and *C. tanneri* fisheries.

EFH Definition for Tanner Crab (*C. bairdi*)

Eggs—Levels 0_b, 1, and 2
Essential habitat for eggs is known for the stocks of *C. bairdi* Tanner crabs in Bristol Bay and the Pribilof Islands based on general distribution (Level 1) and density (Level 2) of egg-bearing female crabs. Essential habitat for eggs of the Eastern Aleutian *C. bairdi* Tanner crab stock is based on general distribution (Level 1) of the egg-bearing females. Essential habitat for eggs of the Western Aleutian *C. bairdi* Tanner crab stock is inferred from the general distribution of mature females. (See also Adults.)

Larvae—Levels 0_c and 1 (no EFH definition determined for the Eastern Aleutian and Western Aleutian stocks)
Larvae of *C. bairdi* Tanner crabs are typically found in EBS Aleutian Island water column from 0 to 100 m in early summer. They are strong swimmers and perform diel migrations in the water column (down at night). They usually stay near the depth of the chlorophyll maximum during the day. The last larval stage settles onto the bottom mud. Essential habitat of *C. bairdi* Tanner crab larvae is based on general distribution (Level 1) for the Bristol Bay and Pribilof Islands stocks. Information is not available to define essential habitat for larval *C. bairdi* Tanner crab in the Eastern Aleutian and Western Aleutian stocks.

Early Juveniles—Levels 0_c and 1 (no EFH definition determined for the Western Aleutian stock)
Early juvenile *C. bairdi* Tanner crabs occur at depths of 10 to 20 m in mud habitat in summer and are known to burrow or associate with many types of cover. Early juvenile *C. bairdi* Tanner crabs are not easily found in winter. Essential habitat of early juvenile *C. bairdi* Tanner crabs is identified by the general distribution (Level 1) of this life stage for the Bristol Bay, Pribilof Islands, and Eastern Aleutian stocks. Information to identify essential habitat of early juvenile *C. bairdi* Tanner crabs in not available for the Western Aleutian stock.

Late Juveniles—Levels 0_c and 1 (no EFH definition determined for the Western Aleutian stock)
The preferred habitat for late juvenile *C. bairdi* Tanner crabs is mud. Late juvenile Tanner crab migrate offshore of their early juvenile nursery habitat. Essential habitat of late juvenile *C. bairdi* Tanner crabs is based on the general distribution (Level 1) and density (Level 2) of this life stage for the Bristol Bay, Pribilof Islands, and Eastern Aleutian stocks. Information to identify essential habitat of late juvenile *C. bairdi* Tanner crabs in not available for the Western Aleutian stock.

Adults—Levels 1 and 2
Mature *C. bairdi* Tanner crabs migrate inshore and mating is known to occur from February through June. Mature female *C. bairdi* Tanner crabs have been observed in high-density mating aggregations, or pods, consisting of hundreds of crabs per mound. These mounds may provide protection from predators and also attract males for mating. Mating need not occur every year, as female *C. bairdi* Tanner crabs can retain viable sperm in spermathecae for 2 years or more. Females carry clutches of 50,000 to

400,000 eggs and nurture the embryos for 1 year after fertilization. Primiparous females may carry the fertilized eggs for as long as 1.5 years. Brooding occurs in depths from 100 to 150 m. Essential habitat is based on the general distribution (Level 1) and density (Level 2) of mature *C. bairdi* Tanner crabs of the Bristol Bay, Pribilof Islands, and Eastern Aleutian stocks. Essential habitat of mature *C. bairdi* Tanner crabs is identified as the general distribution (Level 1) for the Western Aleutian stock.

EFH Definition for Snow Crab (*C. opilio*)

Eggs—Level 2
Essential habitat for eggs is known for the stocks of *C. opilio* snow crabs in the BS based on general distribution (Level 1) and density (Level 2) of egg-bearing female crabs. (See also Adults.)

Larvae—Level 1
Larvae of *C. opilio* snow crab are found in early summer and exhibit diel migration. The last of three larval stages settles onto the bottom in nursery areas. Essential habitat is based on general distribution (Level 1) of *C. opilio* snow crab larvae of the BS stock.

Early Juveniles—Level 1
Shallow water areas of the BS are considered nursery areas for *C. opilio* snow crabs and are confined to the mid-shelf area due to the thermal limits of early and late juvenile life stages. Essential habitat is identified as the general distribution (Level 1) of early juvenile crabs of the BS stock of *C. opilio* snow crabs.

Late Juveniles—Level 2
A geographic decline in size of *C. opilio* snow crabs indicates a large number of morphometrically immature crabs occur in shallow waters less than 80 m. Essential habitat is based on the general distribution (Level 1) and density (Level 2) of juvenile crabs of the BS stock of *C. opilio* snow crabs.

Adults—Level 2
Female *C. opilio* snow crabs are acknowledged to attain terminal molt status at maturity. Primiparous female snow crabs mate from January through June and may exhibit longer egg development period and lower fecundity than multiperous female crabs. Multiparous female snow crabs are able to store spermatophores in seminal vesicles and fertilize subsequent egg clutches without mating. At least two clutches can be fertilized from stored spermatophores, but the frequency of this occurring in nature is not known. Females carry clutches of approximately 36,000 eggs and nurture the embryos for approximately 1 year after fertilization. However, fecundity may decrease up to 50 percent between the time of egg extrusion and hatching presumably due to predation, parasitism, abrasion, or decay of unfertilized eggs. Brooding probably occurs in depths greater than 50 m. Changes in proportion of morphometrically mature crabs by carapace width have been related to an interaction between cohort size and depth.

EFH Definition for Grooved Tanner Crab (*C. tanneri*)

Eggs—Level 0_b
Information for grooved Tanner crab eggs is not available for the EBS, Eastern Aleutian, or Western Aleutian stocks. General distribution of the egg life stage is inferred from the distribution of mature females. (See also Adults.)

Larvae—Level 0_c (no EFH definition determined)
Information to define essential habitat for larvae of grooved Tanner crabs is not available for the EBS, Eastern Aleutian, or Western Aleutian stocks.

Early Juveniles—Level 0_c (no EFH definition determined)
Information to define essential habitat for early juvenile grooved Tanner crabs is not available for the EBS, Eastern Aleutian, or Western Aleutian stocks.

Late Juveniles—Level 0_c (no EFH definition determined)
Information to define essential habitat for late juvenile grooved Tanner crabs is not available for the EBS, Eastern Aleutian, or Western Aleutian stocks.

Adults—Level 1
In the BS, mature male grooved Tanner crabs may be found in somewhat more shallow areas than mature females, but male and female crabs do not show clear segregation by depth. General distribution (Level 1) of mature grooved Tanner crabs is used to identify essential habitat of the EBS, Eastern Aleutian, and Western Aleutian stocks.

EFH Definition for Triangle Tanner Crab (*C. angulatus*)

Eggs—Level 1 (no EFH definition determined)
General distribution (Level 1) of mature triangle Tanner crabs is used to identify essential habitat of the Bristol Bay and Eastern Aleutian stocks. (See also Adults.)

Larvae—Level 0_c (no EFH definition determined)
Information to define essential habitat for larvae of triangle Tanner crabs is not available for the Bristol Bay or Eastern Aleutian stocks.

Early Juveniles—Level 0_c (no EFH definition determined)
Information to define essential habitat for early juvenile triangle Tanner crabs is not available for the Bristol Bay or Eastern Aleutian stocks.

Late Juveniles—Level 0_c (no EFH definition determined)
Information to define essential habitat for late juvenile triangle Tanner crabs is not available for the Bristol Bay or Eastern Aleutian stocks.

Adults—Level 1
The mean depth of mature male triangle Tanner crabs (647 m) is significantly less than for mature females (748 m) indicating some pattern of sexual segregation by depth. General distribution (Level 1) of mature triangle Tanner crabs is used to identify essential habitat of the Bristol Bay and Eastern Aleutian stocks.

D.2.3.3 EFH Map Descriptions for BSAI Crab

Figures D-43 through D-68 show EFH distributions under Alternative 2 for the BSAI crab species described in Section D.2.3.2.

D.2.4 Description of Essential Fish Habitat for Alaska Scallops

D.2.4.1 EFH Information Levels for Alaska Scallops

Species	Eggs	Larvae	Early Juveniles	Late Juveniles	Adults
Weathervane scallops	0a	0a	0a	1	2
Pink scallops	0a	0c	0a	0a	0a
Spiny scallops	0a	0c	0a	0a	0a
Rock scallops	0a	0c	0a	0a	0a

Note: for the larval stages of Pink, Spiny, and Rock scallops information is insufficient to infer general distributions.
0a: Some information on a species' life stage is available upon which to infer general distribution.
0c: No information on the actual species' life stage and no information on a similar species or adjacent life stages is available, or the complexity of a species stock structure prohibited inference of general distribution.

D.2.4.2 EFH Text Descriptions for Alaska Scallops

EFH Definition for Alaskan Weathervane Scallops

Eggs (several days)—Level 0_a
Demersal waters of the inner and middle continental shelf of the GOA and to a lesser extent in the BSAI. Eggs are released in the late spring and early summer.

Larvae (2 to 3 weeks)—Level 0_a
Pelagic waters along the inner, middle, and outer continental shelf of the GOA west of Dixon entrance, extending into the BSAI.

Juveniles (to 3 years)—Level 1
Areas of clay, mud, sand, and gravel along the mid-continental shelf of the BSAI and GOA.

Adults (3+ years)—Level 2
Areas of clay, mud, sand, and gravel along the mid continental shelf of the GOA and BSAI. Areas of concentration are those between the depths of 40 to 130 m. Scallop beds are generally elongated in the direction of current flow.

EFH Definition for Alaskan Pink Scallops

Eggs (several days)—Level 0_a
Demersal waters of the inner and middle continental shelf of the GOA and to a lesser extent in the BSAI. Eggs are released in the winter and early spring.

Larvae (2 to 3 weeks?)—Level 0_c (no EFH definition determined)
Pelagic waters with unknown distribution.

Juveniles (to 2 years)—Level 0_a
Soft bottom areas along the inner and mid-continental shelf of the BSAI and GOA.

Adults (2+ years)—Level 0_a
Soft bottom areas less than 200 m along the inner, middle, and outer continental shelf of the GOA and BSAI.

<u>EFH definition for Alaskan Spiny Scallops</u>

Eggs (several days)—Level 0_a
Demersal waters of the inner continental shelf of the GOA and to a lesser extent in the BSAI. Eggs are released in the late summer.

Larvae (2 to 3 weeks?)—Level 0_c (no EFH definition determined)
Pelagic waters with unknown distribution.

Juveniles (to 2 years)—Level 0_a
Hard bottom areas characterized by strong currents along the inner and middle continental shelf of the GOA.

Adults (2+ years)—Level 0_a
Hard bottom areas shallower than 150 m characterized by strong currents along the inner and middle continental shelf of the GOA.

<u>EFH Definition for Alaskan Rock Scallops</u>

Eggs (several days)—Level 0_a
Demersal waters of the inner continental shelf of the GOA. Eggs are released in the spring and also the autumn months.

Larvae (2 to 3 weeks?)—Level 0_c (no EFH definition determined)
Pelagic waters with unknown distribution.

Juveniles (to 3 years)—Level 0_a
Rocky bottoms in shallow waters (0 to 80 m) characterized by strong currents.

Adults (3+ years)—Level 0_a
Rocky bottoms in shallow waters (0 to 80 m) characterized by strong currents.

D.2.4.3 EFH Map Descriptions for Alaska Scallops

Figures D-69 and D-70 show EFH distribution under Alternative 2 for GOA and BSAI Alaskan weathervane scallops (late juveniles and adults), respectively.

D.2.5 Description of Essential Fish Habitat for Alaska Stocks of Pacific Salmon

D.2.5.1 EFH Information Levels for Alaska Stocks of Pacific Salmon

Region I, Southeastern

Species	Eggs and larvae	Juveniles fresh water (fry - smolt)	Juveniles estuarine	Juveniles marine	Adults, immature/ maturing marine	Adults, fresh water
Chinook	1-2	1-2	1-2	1-2	1-2	1-3
Coho	1-3*	2-4*	1-2	1	1	1-3
Pink	1-3	1-3	1-3	1-3	1-3	1-3
Sockeye	1-3	1-4*	1-3	1-2	1-2	1-3
Chum	1-3	1-3	1-3	1-3	1-2	1-3

Region II, Southcentral

Species	Eggs and larvae	Juveniles fresh water (fry - smolt)	Juveniles estuarine	Juveniles marine	Adults, immature/ maturing marine	Adults fresh water
Chinook	1-2	1-3	1	1	1-2	1-3
Coho	1-2	1-2	1-2	1	1-2	1-2
Pink	1-3	1-2	1-2	1-3	1-3	1-3
Sockeye	1-3	1-4	1-2	1	1-2	1-3
Chum	1-3	1-3	1-2	1-3	1-2	1-3

Region III, Southwestern

Species	Eggs and larvae	Juveniles fresh water (fry-smolt)	Juveniles estuarine	Juveniles marine	Adults, immature/ maturing marine	Adults fresh water
Chinook	1-2	1-2	1	1	1-2	1-3
Coho	1-2	1-2	1-2	1	1-2	1-2
Pink	1-2	1-2	1-2	1-2	1-2	1-3

Region IV, Western

Species	Eggs and larvae	Juveniles fresh water (fry - smolt)	Juveniles estuarine	Juveniles marine	Adults, immature/ maturing marine	Adults, fresh water
Chinook	1-2	1	1	1	1-2	1-2
Coho	1-2	1	1	1	1	1-2
Pink	1	1	1	1	1	1
Sockeye	1	1	0a	0a	1-2	1
Chum	1-2	0a	0a	0a	1-2	1-2

Region V, Arctic

Species	Eggs and larvae	Juveniles fresh water (fry - smolt)	Juveniles estuarine	Juveniles marine	Adults, immature/ maturing marine	Adults fresh water
Chinook	1	1	1	1	1	1
Coho	1	1	1	0a	1	1
Pink	1	0a	0a	0a	0a	1
Sockeye	1	1	0a	0a	0a	1
Chum	1	0a	0a	0a	0a	1-2

Region VI, Interior

Species	Eggs and larvae	Juveniles fresh water (fry-smolt)	Juveniles estuarine	Juveniles marine	Adults, immature/ maturing marine	Adults fresh water
Chinook	1	1	1	1	1	1
Coho	1	1	1	1	1	1
Pink	1	0a	0a	1	0a	1
Sockeye	1	1	0a	0a	0a	1
Chum	1-2	1	1	1	1	1-2

D.2.5.2 EFH Text Descriptions for Alaska Stocks of Pacific Salmon

EFH Definition for Chinook Salmon

Eggs and Larvae—Levels 1 and 2
Those portions of freshwaters within the bounds of ordinary high water where chinook salmon currently or historically occur, that are accessible to adult chinook salmon (or could be cost-effectively made accessible) and that have bottom substrate, water quality, and seasonal flow adequate for the incubation and development of chinook salmon eggs and larvae. Impaired areas with potential for cost-effective restoration are also EFH for chinook salmon. Eggs and larvae require more than 200 days over the period from July to May for incubation in intragravel flows.

Juveniles (freshwater)—Levels 1 to 3
Those portions of freshwaters in Alaska within the bounds of ordinary high water where chinook salmon currently or historically occur that are accessible to juvenile chinook salmon (or could be cost-effectively made accessible), and that provide adequate water quality and productivity conditions for seasonal or year-round rearing or migration for juvenile chinook salmon. Impaired areas with potential for cost-effective restoration are also EFH for chinook salmon. Juvenile chinook salmon require year-round rearing habitat and also migration habitat from April to September to provide access to the sea.

Juveniles (estuarine)—Levels 1 and 2
The salinity transition zone (ecotone) and contiguous intertidal and nearshore habitats below mean higher high tide in Alaska where chinook salmon currently or historically occur. Chinook salmon smolts and post-smolt juveniles may be present in these estuarine habitats from April through September.

Juveniles (marine)—Levels 1 and 2
Marine waters from Dixon Entrance to the Bering Straits, extending from the intertidal to the limits of the U.S. EEZ. Juvenile chinook salmon are present in this habitat from April until annulus formation in January or February of their first winter at sea.

Immature and Maturing Adults (marine)—Levels 1 and 2
Marine waters below mean higher high tide from Dixon Entrance to the Bering Straits, extending from the intertidal to the limits of the EEZ. Immature chinook salmon use this marine habitat year-round. Maturing fish generally are considered to be in their ultimate year of life, and thus, use the habitat from January until September, by which time they have entered freshwater or moved out of the marine EFH in Alaska.

Adults (freshwater)—Levels 1 to 3
Those portions of freshwaters in Alaska within the bounds of ordinary high water where chinook salmon currently or historically occur that are accessible to adult chinook salmon (or could be cost-effectively made accessible) and that provide suitable water quality, migration access, holding areas, spawning substrates, and flow regimes. Impaired areas with potential for cost-effective restoration are also EFH for chinook salmon. Adult chinook salmon use such freshwater habitats in Alaska from April through September.

EFH Definition for Coho Salmon

Eggs and Larvae (freshwater)—Levels 1 to 3
Those portions of freshwaters in Alaska within the bounds of ordinary high water where coho salmon currently or historically occur that are accessible to adult coho salmon (or could be cost-effectively made accessible), and that have substrate, water quality, and seasonal flow adequate for the incubation and development of coho salmon eggs and larvae. Impaired areas with potential for cost-effective restoration are also EFH for coho salmon. Eggs and larvae require more than150 days of incubation (generally over the period from October to May). Preferred substrate is gravel containing less than 15 percent fine sediment (less than 2-millimeter [mm] diameter).

Juveniles (freshwater)—Levels 1 to 4
Those portions of freshwaters in Alaska within the bounds of ordinary high water where coho salmon currently or historically occur that are accessible to juvenile coho salmon (or could be cost-effectively made accessible) and that provide adequate water quality and productivity conditions for seasonal or year-round rearing or migration for juvenile coho salmon. Impaired areas with potential for cost-effective restoration are also EFH for coho salmon. Juvenile coho salmon require year-round rearing habitat and also migration habitat from April to November to provide access to and from the estuary.

Juveniles (estuary)—Levels 1 and 2
Those portions of the salinity transition zone (ecotone) and contiguous intertidal and nearshore habitat below mean higher high tide in Alaska where coho salmon currently or historically occur. Smolts may be present May to August; non-smolts rear in spring and summer.

Juveniles (marine)—Levels 0_a and 1
Marine waters below mean higher high tide from Dixon Entrance to the Bering Straits, extending from the intertidal to the limits of the continental shelf and to a depth of 50 m. Juveniles occupy this area from June to September.

Immature and Maturing Adults (marine)—Levels 1 and 2
Marine waters below mean higher high tide from Dixon Entrance to the Bering Straits, extending from the intertidal to the limits of the EEZ and to a depth of 200 m. Immature coho salmon use this marine habitat year-round. Immature fish generally enter this habitat in late summer and maturing coho salmon return to freshwater to spawn the following late summer or fall.

Adults (freshwater)—Levels 1 to 3
Those portions of freshwaters in Alaska within the bounds of ordinary high water where coho salmon currently or historically occur that are accessible to adult coho salmon (or could be cost-effectively made accessible) and that provide suitable water quality, migration access, holding areas, and spawning substrates and flow regimes. Impaired areas with potential for cost-effective restoration are also EFH for coho salmon. Adult coho may be present in freshwater from July to December.

EFH Definition for Pink Salmon

Eggs and Larvae (freshwater)—Levels 1 to 3
Those portions of freshwaters and the intertidal portion of streams in Alaska within the bounds of ordinary high water where pink salmon currently or historically occur that are accessible to adult pink salmon (or could be cost-effectively made accessible) and that have substrate, water quality, and seasonal flow adequate for the incubation and development of pink salmon eggs and larvae. Impaired areas with potential for cost-effective restoration are also EFH for pink salmon. Eggs and larvae require approximately 225 days of incubation over the period of late summer to early spring. Preferred substrate is medium to course gravel containing less than 15 percent fine sediment (less than 2 mm diameter), 15 to 50 cm in depth.

Juveniles (freshwater)—Levels 0_a and 1 to 3
Those portions of freshwaters in Alaska within the bounds of ordinary high water where pink salmon currently or historically occur that are accessible to pink salmon (or could be cost-effectively made accessible) and that provide adequate water quality conditions for seasonal migration for pink salmon fry. Impaired areas with potential for cost-effective restoration are also EFH for pink salmon. Migrating pink salmon fry are in stream systems during spring, generally migrate in darkness in the upper water column. Fry leave streams within 15 days, and the duration of migration from a stream may last 2 months.

Juveniles (estuary)—Levels 0_a and 1 to 3
Those portions of the salinity transition zone (ecotone) and contiguous intertidal and nearshore habitats below mean higher high tide in Alaska where pink salmon currently or historically occur. Pink salmon juveniles may be present from late April through June.

Juveniles (marine)—Level 0_a and 1 to 3
Coastal waters all along the continental shelf throughout Alaska from mid-summer until December; then moving further off shelf into more pelagic oceanic areas, generally in the upper 50 m of the water column.

Immature and Maturing Adults (marine)—Levels 0_a and 1 to 3
Marine waters below mean higher high tide from Dixon Entrance to the Bering Straits, extending from the intertidal to the limits of the EEZ and to a depth of 200 m. Pink salmon are present from fall through the mid-summer in pelagic waters.

Adults (freshwater)—Levels 1 to 3
Those portions of freshwaters and intertidal areas of streams within the bounds of ordinary high water in Alaska where pink salmon currently or historically occur that are accessible to adult pink salmon (or could be cost-effectively made accessible) and that provide suitable water quality, migration access, holding areas, and spawning substrates and flow regimes. Impaired areas with potential for cost-effective restoration are also EFH for pink salmon. Adult pink salmon may be present in freshwater and the intertidal areas of streams from June through September.

EFH Definition for Chum Salmon

Eggs and Larvae (freshwater)—Levels 1 to 3
Those portions of freshwaters and the intertidal portion of streams in Alaska within the bounds of ordinary high water where chum salmon currently or historically occur that are accessible to adult chum salmon (or could be cost-effectively made accessible) and that have substrate, water quality, and seasonal flow (including upwelling ground water) adequate for the incubation and development of chum salmon eggs and larvae. Impaired areas with potential for cost-effective restoration are also EFH for chum salmon. Eggs and larvae incubate from late summer to early spring. Preferred substrate is medium to course gravel containing less than 15 percent fine sediment (less than 2-mm diameter); finer substrates can be used in upwelling areas of streams and sloughs.

Juveniles (freshwater)—Level 0_a and 1 to 3
Those portions of freshwaters in Alaska within the bounds of ordinary high water where chum salmon currently or historically occur that are accessible to chum salmon (or could be cost-effectively made accessible) and that provide adequate water quality conditions for seasonal migration for chum salmon fry. Impaired areas with potential for cost-effective restoration are also EFH for chum salmon. Migrating chum salmon fry are in stream systems during spring, generally migrate in darkness in the upper water column.

Juvenile Stages (estuarine)—Levels 0_a and 1 to 3
Those portions of the salinity transition zone (ecotone) and contiguous intertidal and nearshore habitats below mean higher high tide in Alaska where chum salmon currently or historically occur. Chum salmon juveniles may be present from late April through June.

Juvenile Stages (marine)—Levels 0_a and 1 to 3
Those areas of ocean in the state of Alaska and the EEZ over the continental shelf between 0 and 50 m in depth.

Immature and Maturing Adults (marine)—Levels 0_a and 1 to 3
Marine waters below mean higher high tide from Dixon Entrance to the Bering Straits, extending from the intertidal to the limits of the EEZ and to a depth of 200 m. Chum salmon are present year round in pelagic waters.

Adults (freshwater)—Levels 1 to 3
Those portions of freshwaters and intertidal areas of streams within the bounds of ordinary high water in Alaska where chum salmon currently or historically occur that are accessible to adult chum salmon (or could be cost-effectively made accessible) and that provide suitable water quality, migration access, holding areas, and spawning substrates and flow régimes. Impaired areas with potential for cost-effective restoration are also EFH for chum salmon. Adult chum salmon may be present in freshwater and intertidal areas of streams from June through January.

EFH Definition for Sockeye Salmon

Eggs and Larvae (freshwater)—Levels 1 to 3
Those portions of freshwaters in Alaska within the bounds of ordinary high water where sockeye salmon currently or historically occur that are accessible to adult sockeye salmon (or could be cost-effectively made accessible) and that have substrate, water quality, and seasonal flow (including upwelling ground water) adequate for the incubation and development of sockeye salmon eggs and larvae. Impaired areas with potential for cost-effective restoration are also EFH for sockeye salmon. Sockeye often spawn in lake substrates, as well as in streams. Eggs and larvae are in these habitats from July through May. Preferred substrate is medium to course gravel containing less than 15 percent fine sediment (less than 2-mm diameter); finer substrates can be used in upwelling areas of streams and sloughs.

Juveniles (freshwater)—Levels 1 to 4
Those portions of freshwaters in Alaska within the bounds of ordinary high water where sockeye salmon currently or historically occur that are accessible to juvenile sockeye salmon (or could be cost-effectively made accessible) and that provide adequate water quality and productivity conditions for seasonal rearing and migration for juvenile sockeye salmon. Impaired areas with potential for cost-effective restoration are also EFH for sockeye salmon. Juvenile sockeye salmon require year-round rearing habitat and also migration habitat from April to November to provide access to the estuary. Fry generally migrate downstream to a lake or, in systems lacking a freshwater lake, to estuarine and riverine rearing areas. Migration of fry and smolts is generally in spring and summer.

Juveniles (estuary)—Levels 0_a, 1, and 2
Those portions of the salinity transition zone (ecotone) and contiguous intertidal and nearshore habitats below mean higher high tide in Alaska where sockeye salmon currently or historically occur. Under-yearling, yearling, and older smolts occupy estuaries from March through early August.

Juveniles (marine)—Levels 0_a, 1 and 2
Coastal waters all along the continental shelf throughout Alaska and the EEZ from mid-summer until December; generally in the upper 50 m of the water column.,

Immature and Maturing Adults (marine)—Levels 0_a, 1, and 2
Marine waters below mean higher high tide from Dixon Entrance to the Bering Straits, extending from the intertidal to the limits of the EEZ and to a depth of 200 m. Sockeye salmon are present year round in pelagic waters. Ocean residence is 1 to 3 years.

Adults (freshwater)—Levels 1 to 3
Those portions of freshwaters and upper intertidal areas of streams within the bounds of ordinary high water in Alaska where sockeye salmon currently or historically occur that are accessible to adult sockeye salmon (or could be cost-effectively made accessible) and that provide suitable water quality, migration access, holding areas, and spawning substrates and flow regimes. Impaired areas with potential for cost-effective restoration are also EFH for sockeye salmon. Adult sockeye salmon may be present in freshwater from June through September, and sockeye often spawn in lake substrates, as well as in streams.

D.2.5.3 EFH Map Descriptions for Alaska Stocks of Pacific Salmon

Figures D-71 through D-76 show EFH distributions by region for the Alaska stocks of Pacific salmon described in Section D.2.5.2.

D.3 Alternative 3 (Preliminary Preferred Alternative): Revised General Distribution

EFH is the general distribution of a species described by life stage. General distribution is a subset of a species population and is 95 percent of the population for a particular life stage, if life history data are available for the species. Where information is insufficient and a suitable proxy cannot be inferred, EFH is not described. General distribution is used to describe EFH for all stock conditions whether or not higher levels of information exist, because the available higher level data are not sufficiently comprehensive to account for changes in stock distribution (and thus habitat use) over time.

Alternative 3 describes EFH for FMP-managed species by life stage as general distribution using new guidance from the EFH Final Rule, such as the updated EFH Level of Information definitions. Alterative 3 uses new analytical tools and incorporates recent scientific information for each life history stage from updated scientific habitat assessment reports (see Appendix F). EFH descriptions include both text and a map, if information is available for a species' particular life stage. Alternative 3 is risk averse, supported by scientific rationale, and accounts for changing oceanographic conditions, regime shifts, and the seasonality of migrating fish stocks.

Objective

The objective of this alternative is to describe EFH for each life stage using the best available scientific information, i.e. only those waters and substrates where the species is known to associate or recruit in scientific surveys and commercial fishery catches. EFH is described as 95 percent of the population where the species life stage has been recruited to the survey, investigated through research, officially observed, or reported in a vessel catch log.

Methodology

In addition to scientific information sources analyzed in Alternative 2, the Alternative 3 analysis focused on two significant fishery geographic information data resources: survey (Resource Assessment and Conservation Engineering Division [RACE]) and observer (NORPAC). For adult and late juvenile life stages, each data set was analyzed for 95 percent of the total accumulated population for the species using GIS. For eggs and larvae, the EFH description is based on presence/absence data from surveys (AFSC RACE Matarese 2003). EFH is identified as the areas where eggs and larvae are most commonly encountered in those surveys, which is the best available information regarding habitat use for those life stages. EFH shape files were developed based on these data sets.

For adult and late juvenile life stages of BSAI Groundfish, GOA Groundfish, BSAI Crab, and Scallop FMP species, fishery catch per unit of effort (CPUE) data from the NMFS Observer database (NORPAC, 1990 to 2001) and NMFS trawl survey data from RACE, 1987 to 2002 and, where appropriate, ADF&G survey data were analyzed to estimate the population distribution of each species. Where this information exists, the area described by these data is identified as EFH. The analyzed EFH data and area were further reviewed by scientific stock assessment authors for accuracy. This review ensures that any outlying areas not considered were included, and errors in the data or described EFH area were removed.

For Salmon FMP species, the analysis is broken into three parts: marine, nearshore, and freshwater. Marine and nearshore salmon EFH is generally described to include all marine waters from the mean higher tide line to the limits of the EEZ since science recognizes that salmon are 1) distributed throughout all marine waters during late juvenile and adult life stages, and 2) found nearshore and along coastal migration corridors as early juvenile life stages out migrate and adult life stages return to and from freshwater areas, respectively. Freshwater areas used by egg, larvae, and returning adult salmon

will be analyzed as those areas indexed by the ADF&G's *Catalog of Waters Important for the Spawning, Rearing, or Migration of Anadromous Fishes* (ADF&G 1998a), specifically Pacific salmon species. Freshwater salmon systems are generally defined as those areas above mean higher tide to the upper limits of those freshwater systems supporting salmon and may include contiguous wetland areas, such as those areas hydrologically connected to the main water source via access channels to an adjacent river, stream, lake, pond, etc.

Rationale

Alternative 3 incorporates the same basic rationales to describe EFH as in Alternative 2.

D.3.1 Description of Essential Fish Habitat for the Groundfish Resources of the BSAI Regions

D.3.1.1 EFH Information Levels for BSAI Groundfish

BSAI Species	Eggs	Larvae	Early Juvenile	Late Juvenile	Adult
Walleye pollock	1	1	x	1	1
Pacific cod	x	1	x	1	1
Yellowfin sole	x	x	x	1	1
Greenland turbot	1	1	x	1	1
Arrowtooth flounder	x	x	x	1	1
Rock sole	x	1	x	1	1
Alaska plaice	x	x	x	1	1
Rex sole	x	x	x	1	1
Dover sole	x	x	x	1	1
Flathead sole	1	1	x	1	1
Sablefish	x	1	x	1	1
Pacific ocean perch	x	1	x	1	1
Shortraker/rougheye rockfish	x	1	x	x	1
Northern rockfish	x	1	x	x	1
Thornyhead rockfish	x	1	x	1	1
Yelloweye rockfish	x	1	x	1	1
Dusky rockfish	x	1	x	x	1
Atka mackerel	x	1	x	x	1
Skates	x	x	x	x	1
Sculpins	x	x	x	1	1
Sharks	x	x	x	1	1
Forage fish complex	x	x	x	x	x
Squid	x	x	x	1	1
Octopus	x	x	x	x	x

D.3.1.2 EFH Text Descriptions for BSAI Groundfish

<u>EFH Description for BSAI Walleye Pollock</u>

Eggs

EFH for walleye pollock eggs is the general distribution area for this life stage, located in pelagic waters along the entire shelf (0 to 200 m), upper slope (200 to 500 m), and intermediate slope (500 to 1,000 m) throughout the BSAI, as depicted in Figure D-77.

Larvae
EFH for larval walleye pollock is the general distribution area for this life stage, located in epipelagic waters along the entire shelf (0 to 200 m), upper slope (200 to 500 m), and intermediate slope (500 to 1,000 m) throughout the BSAI, as depicted in Figure D-78.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for late juvenile walleye pollock is the general distribution area for this life stage, located in the lower and middle portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf throughout the BSAI, as depicted in Figure D-79. No known preference for substrates exist.

Adults
EFH for adult walleye pollock is the general distribution area for this life stage, located in the lower and middle portion of the water column along the entire shelf (0 to 200 m) and slope (200 to 1,000 m) throughout the BSAI, as depicted in Figure D-79. No known preference for substrates exist.

EFH Description for BSAI Pacific Cod

Eggs—No EFH Description Determined
Scientific information notes the rare occurrence of Pacific cod eggs in the BSAI.

Larvae—No EFH Description Determined
Scientific information notes the rare occurrence of larval Pacific cod in the BSAI (Figure D-80, revision in process).

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for late juvenile Pacific cod is the general distribution area for this life stage, located in the lower portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf throughout the BSAI wherever there are soft substrates consisting of sand, mud, sandy mud, and muddy sand, as depicted in Figure D-81.

Adults
EFH for adult Pacific cod is the general distribution area for this life stage, located in the lower portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf throughout the BSAI wherever there are soft substrates consisting of sand, mud, sandy mud, muddy sand, and gravel, as depicted in Figure D-81.

EFH Description for BSAI Yellowfin Sole

Eggs—No EFH Description Determined
Scientific information notes the rare occurrence of yellowfin sole eggs in the BSAI.

Larvae—No EFH Description Determined
Scientific information notes the rare occurrence of larval yellowfin sole in the BSAI.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for late juvenile yellowfin sole is the general distribution area for this life stage, located in the lower portion of the water column within nearshore bays and along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf throughout the BSAI wherever there are soft substrates consisting mainly of sand, as depicted in Figure D-82. Change figure header to include late juv's with adults

Adults
EFH for adult yellowfin sole is the general distribution area for this life stage, located in the lower portion of the water column within nearshore bays and along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf throughout the BSAI wherever there are soft substrates consisting mainly of sand, as depicted in Figure D-82.

EFH Description for BSAI Greenland Turbot

Eggs
EFH for Greenland turbot eggs is the general distribution area for this life stage, located principally in benthypelagic waters along the outer shelf (100 to 200 m) and slope (200 to 3,000 m) throughout the BSAI in the fall, as depicted in Figure D-83.

Larvae
EFH for larval Greenland turbot is the general distribution area for this life stage, located principally in benthypelagic waters along the outer shelf (100 to 200 m) and slope (200 to 3,000 m) throughout the BSAI and seasonally abundant in the spring, as depicted in Figure D-84.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for late juvenile Greenland turbot is the general distribution area for this life stage, located in the lower and middle portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf and upper slope (200 to 500 m) throughout the BSAI wherever there are softer substrates consisting of mud and sandy mud, as depicted in Figure D-85.

Adults
EFH for late adult Greenland turbot is the general distribution area for this life stage, located in the lower and middle portion of the water column along the outer shelf (100 to 200 m), upper slope (200 to 500 m), and lower slope (500 to 1,000 m) throughout the BSAI wherever there are softer substrates consisting of mud and sandy mud, as depicted in Figure D-85.

EFH Description for BSAI Arrowtooth Flounder

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae—No EFH Description Determined
Scientific information notes the rare occurrence of larval arrowtooth flounder in the BSAI.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for late juvenile arrowtooth flounder is the general distribution area for this life stage, located in the lower portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf and upper slope (200 to 500 m) throughout the BSAI wherever there are softer substrates consisting of gravel, sand, and mud, as depicted in Figure D-86.

Adults
EFH for adult arrowtooth flounder is the general distribution area for this life stage, located in the lower portion of the water column along the inner (0 to 50), middle (50 to 100 m), and outer (100 to 200 m) shelf and upper slope (200 to 500 m) throughout the BSAI wherever there are softer substrates consisting of gravel, sand, and mud, as depicted in Figure D-86.

EFH Description for BSAI Rock Sole

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae
EFH for larval rock sole is the general distribution area for this life stage, located in pelagic waters along the entire shelf (0 to 200 m) and upper slope (200 to 1,000 m) throughout the BSAI, as depicted in Figure D-87.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for late juvenile rock sole is the general distribution area for this life stage, located in the lower portion of the water column along the inner (0 to 50 m), middle (50 to100 m), and outer (100 to 200 m) shelf throughout the BSAI wherever there are softer substrates consisting of sand, gravel, and cobble, as depicted in Figure D-88.

Adults
EFH for adult rock sole is the general distribution area for this life stage, located in the lower portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf throughout the BSAI wherever there are softer substrates consisting of sand, gravel, and cobble, as depicted in Figure D-88.

EFH Description for BSAI Alaska Plaice

Eggs
EFH for Alaska plaice eggs is the general distribution area for this life stage, located in pelagic waters along the entire shelf (0 to 200 m) and upper slope (200 to 500 m) throughout the BSAI in the spring, as depicted in Figure D-89.

Larvae—No EFH Description Determined
Scientific information notes the rare occurrence of larval Alaska plaice in the BSAI.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for late juvenile Alaska plaice is the general distribution area for this life stage, located in the lower portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf throughout the BSAI wherever there are softer substrates consisting of sand and mud, as depicted in Figure D-90.

Adults
EFH for adult Alaska plaice is the general distribution area for this life stage, located in the lower portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf throughout the BSAI wherever there are softer substrates consisting of sand and mud, as depicted in Figure D-90.

EFH Description for BSAI Rex Sole

Eggs—No EFH Description Determined
Scientific information notes the rare occurrence of rex sole eggs in the BSAI.

Larvae—No EFH Description Determined
Scientific information notes the rare occurrence of larval rex sole in the BSAI.

Late Juveniles
EFH for juvenile rex sole is the general distribution area for this life stage, located in the lower portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf throughout the BSAI wherever there are substrates consisting of gravel, sand, and mud, as depicted in Figure D-91.

Adults
EFH for adult rex sole is the general distribution area for this life stage, located in the lower portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf throughout the BSAI wherever there are substrates consisting of gravel, sand, and mud, as depicted in Figure D-91.

EFH Description for BSAI Dover Sole

Eggs—No EFH Description Determined
Scientific information notes the rare occurrence of Dover sole eggs in the BSAI.

Larvae—No EFH Description Determined
Scientific information notes the rare occurrence of larval Dover sole in the BSAI.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for late juvenile Dover sole is the general distribution area for this life stage, located in the lower portion of the water column along the middle (50 to 100 m), and outer (100 to 200 m) shelf and upper slope (200 to 500 m) throughout the BSAI wherever there are substrates consisting of sand and mud, as depicted in Figure D-92.

Adults
EFH for adult Dover sole is the general distribution area for this life stage, located in the lower portion of the water column along the middle (50 to 100 m), and outer (100 to 200 m) shelf and upper slope (200 to 500 m) throughout the BSAI wherever there are substrates consisting of sand and mud, as depicted in Figure D-92.

EFH Description BSAI Flathead Sole

Eggs
EFH for flathead sole eggs is the general distribution area for this life stage, located in pelagic waters along the entire shelf (0 to 200 m) and slope (200 to 3,000 m) throughout the BSAI in the spring, as depicted in Figure D-93.

Larvae
EFH for larval flathead sole is the general distribution area for this life stage, located in pelagic waters along the entire shelf (0 to 200 m) and slope (200 to 3,000 m) throughout the BSAI, as depicted in Figure D-94.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for juvenile flathead sole is the general distribution area for this life stage, located in the lower portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf throughout the BSAI wherever there are softer substrates consisting of sand and mud, as depicted in Figure D-95.

Adults
EFH for adult flathead sole is the general distribution area for this life stage, located in the lower portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf throughout the BSAI wherever there are softer substrates consisting of sand and mud, as depicted in Figure D-95.

EFH Description for BSAI Sablefish

Eggs—No EFH Description Determined
Scientific information notes the rare occurrence of sablefish eggs in the BSAI.

Larvae—No EFH Description Determined
Scientific information notes the rare occurrence of larval sablefish in the BSAI (Figure D-96, revision in process).

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for late juvenile sablefish is the general distribution area for this life stage, located in the lower portion of the water column, varied habitats, generally softer substrates, and deep shelf gulleys along the slope (200 to 1,000 m) throughout the BSAI, as depicted in Figure D-97.

Adults
EFH for adult sablefish is the general distribution area for this life stage, located in the lower portion of the water column, varied habitats, generally softer substrates, and deep shelf gulleys along the slope (200 to 1,000 m) throughout the BSAI, as depicted in Figure D-97.

EFH Description for BSAI Pacific Ocean Perch

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae
EFH for larval Pacific ocean perch is the general distribution area for this life stage, located in pelagic waters along the entire shelf (0 to 200 m) and slope (200 to 3,000 m) throughout the BSAI, as depicted in Figure D-98, General Distribution of Rockfish Larvae.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for late juvenile Pacific ocean perch is the general distribution area for this life stage, located in the middle to lower portion of the water column along the inner shelf (1 to 50 m), middle shelf (50 to 100 m), outer shelf (100 to 200 m), and upper slope (200 to 500 m) throughout the BSAI wherever there are substrates consisting of cobble, gravel, mud, sandy mud, or muddy sand, as depicted in Figure D-99.

Adults
EFH for adult Pacific ocean perch is the general distribution area for this life stage, located in the lower portion of the water column along the outer shelf (100 to 200 m) and upper slope (200 to 500 m) throughout the BSAI wherever there are substrates consisting of cobble, gravel, mud, sandy mud, or muddy sand, as depicted in Figure D-99.

EFH Descriptions for BSAI Shortraker and Rougheye Rockfish

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae
EFH for larval shortraker and rougheye rockfish is the general distribution area for this life stage, located in epipelagic waters along the entire shelf (0 to 200 m) and slope (200 to 3,000 m) throughout the BSAI, as depicted in Figure D-98, General Distribution of Rockfish Larvae.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles—No EFH Description Determined
Insufficient information is available.

Adults
EFH for adult shortraker and rougheye rockfish is the general distribution area for this life stage, located in the lower portion of the water column along the outer shelf (100 to 200 m) and upper slope (200 to 500 m) regions throughout the BSAI wherever there are substrates consisting of mud, sand, sandy mud, muddy sand, rock, cobble, and gravel, as depicted in Figure D-100.

EFH Description for BSAI Northern Rockfish

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae
EFH for larval northern rockfish is the general distribution area for this life stage, located in pelagic waters along the entire shelf (0 to 200 m) and slope (200 to 3,000 m) throughout the BSAI, as depicted in Figure D-98, General Distribution of Rockfish Larvae.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles—No EFH Description Determined
Insufficient information is available.

Adults
EFH for adult northern rockfish is the general distribution area for this life stage, located in the middle and lower portions of the water column along the outer slope (100 to 200 m) and upper slope (200 to 500 m) throughout the BSAI wherever there are substrates of cobble and rock, as depicted in Figure D-101.

EFH Description for BSAI Thornyhead Rockfish

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae
EFH for larval thornyhead rockfish is the general distribution area for this life stage, located in epipelagic waters along the outer shelf (100 to 200 m) and slope (200 to 3,000 m) throughout the BSAI, as depicted in Figure D-98, General Distribution of Rockfish Larvae.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for late juvenile Thornyhead rockfish is the general distribution area for this life stage, located in the lower portion of the water column along the middle and outer shelf (50 to 200 m) and upper to lower slope (200 to 1,000 m) throughout the BSAI wherever there are substrates of mud, sand, rock, sandy mud, muddy sand, cobble, and gravel, as depicted in Figure D-102.

Adults
EFH for adult Thornyhead rockfish is the general distribution area for this life stage, located in the lower portion of the water column along the middle and outer shelf (50 to 200 m) and upper to lower slope (200 to 1,000 m) throughout the BSAI wherever there are substrates of mud, sand, rock, sandy mud, muddy sand, cobble, and gravel, as depicted in Figure D-102.

EFH Description for BSAI Yelloweye Rockfish

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae
EFH for larval yelloweye rockfish is the general distribution area for this life stage, located in the epipelagic waters along the entire shelf (0 to 200 m) and slope (200 to 3,000 m) throughout the BSAI, as depicted in Figure D-98, General Distribution of Rockfish Larvae.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for late juvenile yelloweye rockfish is the general distribution area for this life stage, located in the lower portion of the water column within bays and island passages and along the inner (0 to 50 m), middle (50 to 100 m), and outer shelf (100 to 200 m) throughout the BSAI wherever there are substrates of rock and in areas of vertical relief, such as crevices, overhangs, vertical walls, coral, and larger sponges, as depicted in Figure D-103.

Adults
EFH for adult yelloweye rockfish is the general distribution area for this life stage, located in the lower portion of the water column within bays and island passages and along the inner shelf (0 to 50 m), outer shelf (100 to 100 m), and upper slope (200 to 500 m) throughout the BSAI wherever there are substrates of rock and in vegetated areas of vertical relief, such as crevices, overhangs, vertical walls, coral, and larger sponges, as depicted in Figure D-103.

EFH Description for BSAI Dusky Rockfish

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae—No EFH Description Determined
Insufficient information is available.

Larvae
EFH for larval dusky rockfish is the general distribution area for this life stage, located in the pelagic waters along the entire shelf (0 to 200 m) and slope (200 to 3,000 m) throughout the BSAI, as depicted in Figure D-98, General Distribution of Rockfish Larvae.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles—No EFH Description Determined
Insufficient information is available.

Adults
EFH for adult dusky rockfish is the general distribution area for this life stage, located in the middle and lower portions of the water column along the outer shelf (100 to 200 m) and upper slope (200 to 500 m) throughout the BSAI wherever there are substrates of cobble, rock, and gravel, as depicted in Figure D-104.

EFH Description for BSAI Atka Mackerel

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae
EFH for larval atka mackerel is the general distribution area for this life stage, located in epipelagic waters along the shelf (0 to 200 m), upper slope (200 to 500 m), and intermediate slope (500-1000 m) throughout the BSAI, as depicted in Figure D-105.

Early Juveniles —No EFH Description Determined
Insufficient information is available.

Late Juveniles—No EFH Description Determined
Insufficient information is available.

Adults
EFH for adult Atka mackerel is the general distribution area for this life stage, located in the entire water column, from sea surface to the sea floor, along the inner (0 to 50 m), middle (50 to 100 m), and outer shelf (100 to 200 m) throughout the BSAI wherever there are substrates of gravel and rock and in vegetated areas of kelp, as depicted in Figure D-106.

EFH Description for BSAI Skates

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae—No EFH Description Determined
Insufficient information is available.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Adults
EFH for adult skates is the general distribution area for this life stage, located in the lower portion of the water column on the shelf (0 to 200 m) and the upper slope (200 to 500 m) throughout the BSAI wherever there are of substrates of mud, sand, gravel, and rock, as depicted in Figure D-107.

EFH Description for BSAI Sculpins

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae—No EFH Description Determined
Insufficient information is available.

Juveniles
EFH for juvenile sculpins is the general distribution area for this life stage, located in the lower portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), outer shelf (100 to 200 m) and portions of the upper slope (200 to 500 m) throughout the BSAI wherever there are substrates of rock, sand, mud, cobble, and sandy mud, as depicted in Figure D-108.

Adults
EFH for adult sculpins is the general distribution area for this life stage, located in the lower portion of the water column along the inner (0 to 50 m), middle (50 to 100 m, outer shelf (100 to 200 m) and portions of the upper slope (200 to 500 m) throughout the BSAI wherever there are substrates of rock, sand, mud, cobble, and sandy mud, as depicted in Figure D-108.

EFH Description for BSAI Sharks

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae—No EFH Description Determined
Insufficient information is available.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles—No EFH Description Determined
Insufficient information is available.

Adults—No EFH Description Determined
Insufficient information is available.

EFH Description for BSAI Forage Fish Complex—Eulachon, Capelin, Sand Lance, Sand Fish, Euphausiids, Myctophids, Pholids, Gonostomatids, etc.

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae—No EFH Description Determined
Insufficient information is available.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles—No EFH Description Determined
Insufficient information is available.

Adults—No EFH Description Determined
Insufficient information is available.

EFH Description for BSAI Squid

Eggs—No EFH Description Determined
Insufficient information is available.

Young Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for older juvenile squid is the general distribution area for this life stage, located in the entire water column, from the sea surface to sea floor, along the inner (0 to 50 m), middle (50 to 100 m), and outer (200 to 500 m) shelf and the entire slope (500 to 1,000 m) throughout the BSAI, as depicted in Figure D-109.

Adults
EFH for adult squid is the general distribution area for this life stage, located in the entire water column, from the sea surface to sea floor, along the inner (0 to 50 m), middle (50 to 100 m), and outer (200 to 500 m) shelf and the entire slope (500 to 1,000 m) throughout the BSAI, as depicted in Figure D-109.

EFH Description for BSAI Octopus

Eggs—No EFH Description Determined
Insufficient information is available.

Young Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles—No EFH Description Determined
Insufficient information is available.

Adults—No EFH Description Determined
Insufficient information is available.

D.3.1.3 EFH Map Descriptions for BSAI Groundfish

Figures D-77 through D-109 show EFH distribution under Alternative 3 for the BSAI groundfish species as described in Section D.3.1.2.

D.3.2 Description of Essential Fish Habitat for the Groundfish Resources of the GOA Groundfish Region

D.3.2.1 EFH Information Levels for GOA Groundfish

GOA Species	Eggs	Larvae	Early Juvenile	Late Juvenile	Adult
Walleye pollock	1	1	x	1	1
Pacific cod	1	1	x	1	1
Yellowfin sole	1	1	x	1	1
Arrowtooth flounder	x	1	x	1	1
Rock sole	x	1	x	1	1
Alaska plaice	1	1	x	1	1
Rex sole	1	1	x	1	1
Dover sole	1	1	x	1	1
Flathead sole	1	1	x	1	1
Sablefish	1	1	x	1	1
Pacific ocean perch	x	1	x	1	1
Shortraker/rougheye rockfish	x	1	x	x	1
Northern rockfish	x	1	x	x	1
Thornyhead rockfish	x	1	x	1	1
Yelloweye rockfish	x	1	x	1	1
Dusky rockfish	x	1	x	x	1
Atka mackerel	x	1	x	x	1
Sculpins	x	x	x	1	1
Skates	x	x	x	x	1
Sharks	x	x	x	x	1
Forage fish complex	x	x	x	x	x
Squid	x	x	x	1	1
Octopus	x	x	x	x	x

D.3.2.2 EFH Text Descriptions for GOA Groundfish

<u>EFH Description for GOA Walleye Pollock</u>

Eggs

EFH for walleye pollock eggs is the general distribution area for this life stage, located in pelagic waters along the entire shelf (0 to 200 m), upper slope (200 to 500 m), and intermediate slope (500 to 1,000 m) throughout the GOA, as depicted in Figure D-110.

Larvae
EFH for larval walleye pollock is the general distribution area for this life stage, located in epipelagic waters along the entire shelf (0 to 200 m), upper slope (200 to 500 m), and intermediate slope (500 to 1,000 m) throughout the GOA, as depicted in Figure D-111.

Early Juveniles—No EFH Description Determined
Limited information exists to describe walleye pollock early juvenile larval general distribution; however, the data cannot be analyzed in the same manner as directed by the approach for Alternative 3.

Late Juveniles
EFH for late juvenile walleye pollock is the general distribution area for this life stage, located in the lower and middle portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf along the throughout the GOA, as depicted in Figure D-112. No known preference for substrates exist.

Adults
EFH for adult walleye pollock is the general distribution area for this life stage, located in the lower and middle portion of the water column along the entire shelf (0 to 200) and slope (200 to 1,000 m) throughout the GOA, as depicted in Figure D-112. No known preference for substrates exist.

EFH Description for GOA Pacific Cod

Eggs
EFH for Pacific cod eggs is the general distribution area for this life stage, located in pelagic waters along the entire shelf (0 to 200 m) and upper (200 to 500 m) slope throughout the GOA wherever there are soft substrates consisting of mud and sand, as depicted in Figure D-113.

Larvae
EFH for larval Pacific cod is the general distribution area for this life stage, located in pelagic waters along the inner (0 to 50 m) and middle (50 to 100 m) shelf throughout the GOA wherever there are soft substrates consisting of mud and sand, as depicted in Figure D-114.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for late juvenile Pacific cod is the general distribution area for this life stage, located in the lower portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf throughout the BSAI wherever there are soft substrates consisting of sand, mud, sandy mud, and muddy sand, as depicted in Figure D-115.

Adults
EFH for adult Pacific cod is the general distribution area for this life stage, located in the lower portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf throughout the GOA wherever there are soft substrates consisting of sand, mud, sandy mud, muddy sand, and gravel, as depicted in Figure D-115.

EFH Description for GOA Yellowfin Sole

Eggs
EFH for yellowfin sole eggs is the general distribution area for this life stage, located in pelagic waters along the entire shelf (0 to 200 m) and upper (200 to 500 m) slope throughout the GOA, as depicted in Figure D-116.

Larvae
EFH for larval yellowfin sole is the general distribution area for this life stage, located in pelagic waters along the shelf (0 to 200 m) and upper slope (200 to 500 m) throughout the GOA, as depicted in Figure D-117.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for late juvenile yellowfin sole is the general distribution area for this life stage, located in the lower portion of the water column within nearshore bays and along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf throughout the GOA wherever there are soft substrates consisting mainly of sand, as depicted in Figure D-118.

Adults
EFH for adult yellowfin sole is the general distribution area for this life stage, located in the lower portion of the water column within nearshore bays and along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf throughout the GOA wherever there are soft substrates consisting mainly of sand, as depicted in Figure D-118.

EFH Description for GOA Arrowtooth Flounder

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae
EFH for larval arrowtooth flounder is the general distribution area for this life stage, located in pelagic waters along the entire shelf (0 to 200 m) and slope (200 to 3,000 m) throughout the GOA, as depicted in Figure D-119.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for late juvenile arrowtooth flounder is the general distribution area for this life stage, located in the lower portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf and upper slope (200 to 500 m) throughout the GOA wherever there are softer substrates consisting of gravel, sand, and mud, as depicted in Figure D-120.

Adults
EFH for adult arrowtooth flounder is the general distribution area for this life stage, located in the lower portion of the water column along the inner (0 to 50), middle (50 to 100 m), and outer (100 to 200 m)

shelf and upper slope (200 to 500 m) throughout the GOA wherever there are softer substrates consisting of gravel, sand, and mud, as depicted in Figure D-120.

EFH Description for GOA Rock Sole

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae
EFH for larval rock sole is the general distribution area for this life stage, located in pelagic waters along the entire shelf (0 to 200 m) and upper slope (200 to 1,000 m) throughout the GOA, as depicted in Figure D-121.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for late juvenile rock sole is the general distribution area for this life stage, located in the lower portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf throughout the BSAI wherever there are softer substrates consisting of sand, gravel, and cobble, as depicted in Figure D-122.

Adults
EFH for adult rock sole is the general distribution area for this life stage, located in the lower portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf throughout the BSAI wherever there are softer substrates consisting of sand, gravel, and cobble. Depicted in Figure D-122.

EFH Description for GOA Alaska Plaice

Eggs
EFH for Alaska plaice eggs is the general distribution area for this life stage, located in pelagic waters along the entire shelf (0 to 200 m) and upper slope (200 to 500 m) throughout the GOA in the spring, as depicted in Figure D-123.

Larvae
EFH for larval Alaska plaice is the general distribution area for this life stage, located in pelagic waters along the entire shelf (0 to 200 m) and upper slope (200 to 500 m) throughout the GOA, as depicted in Figure D-124.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for late juvenile Alaska plaice is the general distribution area for this life stage, located in the lower portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf throughout the BSAI wherever there are softer substrates consisting of sand and mud, as depicted in Figure D-125.

Adults
EFH for adult Alaska plaice is the general distribution area for this life stage, located in the lower portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf throughout the BSAI wherever there are softer substrates consisting of sand and mud, as depicted in Figure D-125.

EFH Description for GOA Rex Sole

Eggs
EFH for rex sole eggs is the general distribution area for this life stage, located in pelagic waters along the entire shelf (0 to 200 m) and upper slope (200 to 500 m) throughout the GOA in the spring, as depicted in Figure D-126.

Larvae
EFH for larval rex sole is the general distribution area for this life stage, located in pelagic waters along the entire shelf (0 to 200 m) and upper slope (200 to 500 m) throughout the GOA, as depicted in Figure D-127.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for juvenile rex sole is the general distribution area for this life stage, located in the lower portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf throughout the GOA wherever there are substrates consisting of gravel, sand, and mud, as depicted in Figure D-128.

Adults
EFH for adult rex sole is the general distribution area for this life stage, located in the lower portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf throughout the GOA wherever there are substrates consisting of gravel, sand, and mud, as depicted in Figure D-128.

EFH Description for GOA Dover Sole

Eggs
EFH for Dover sole eggs is the general distribution area for this life stage, located in pelagic waters along the entire shelf (0 to 200 m) and slope (200 to 3,000 m) throughout the GOA, as depicted in Figure D-129.

Larvae
EFH for larval Dover sole is the general distribution area for this life stage, located in pelagic waters along the entire shelf (0 to 200 m) and slope (200 to 3,000 m) throughout the GOA, as depicted in Figure D-130.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for late juvenile Dover sole is the general distribution area for this life stage, located in the lower portion of the water column along the middle (50 to 100 m), and outer (100 to 200 m) shelf and upper slope (200 to 500 m) throughout the GOA wherever there are substrates consisting of sand and mud, as depicted in Figure D-131.

Adults
EFH for adult Dover sole is the general distribution area for this life stage, located in the lower portion of the water column along the middle (50 to 100 m), and outer (100 to 200 m) shelf and upper slope (200 to 500 m) throughout the GOA wherever there are substrates consisting of sand and mud, as depicted in Figure D-131.

EFH Description GOA Flathead Sole

Eggs
EFH for flathead sole eggs is the general distribution area for this life stage, located in pelagic waters along the entire shelf (0 to 200 m) and slope (200 to 3,000 m) throughout the GOA, as depicted in Figure D-132.

Larvae
EFH for larval flathead sole is the general distribution area for this life stage, located in pelagic waters along the entire shelf (0 to 200 m) and slope (200 to 3,000 m) throughout the GOA, as depicted in Figure D-133.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for juvenile flathead sole is the general distribution area for this life stage, located in the lower portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf throughout the GOA wherever there are softer substrates consisting of sand and mud, as depicted in Figure D-134.

Adults
EFH for adult flathead sole is the general distribution area for this life stage, located in the lower portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf throughout the GOA wherever there are softer substrates consisting of sand and mud, as depicted in Figure D-134.

EFH Description for GOA Sablefish

Eggs
EFH for sablefish eggs is the general distribution area for this life stage, located in deeper waters along the slope (200 to 3,000 m) throughout the GOA, as depicted in Figure D-135.

Larvae
EFH for larval sablefish is the general distribution area for this life stage, located in epipelagic waters along the middle shelf (50 to 100 m), outer shelf (100 to 200 m), and slope (200 to 3,000 m) throughout the GOA, as depicted in Figure D-136.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for late juvenile sablefish is the general distribution area for this life stage, located in the lower portion of the water column, varied habitats, generally softer substrates, and deep shelf gulleys along the slope (200 to 1,000 m) throughout the GOA, as depicted in Figure D-137.

Adults
EFH for adult sablefish is the general distribution area for this life stage, located in the lower portion of the water column, varied habitats, generally softer substrates, and deep shelf gulleys along the slope (200 to 1,000 m) throughout the GOA, as depicted in Figure D-137.

EFH Description for GOA Pacific Ocean Perch

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae
EFH for larval Pacific ocean perch is the general distribution area for this life stage, located in the middle to lower portion of the water column along the inner shelf (0 to 50 m), middle shelf (50 to 100 m), outer shelf (100 to 200 m), and upper slope (200 to 500 m) throughout the GOA as depicted in Figure D-138, General Distribution of Rockfish Larvae.

Early Juveniles—No EFH Description Determined.
Insufficient information is available.

Late Juveniles
EFH for late juvenile Pacific ocean perch is the general distribution area for this life stage, located in the middle to lower portion of the water column along the inner shelf (0 to 50 m), middle shelf (50 to 100 m), outer shelf (100 to 200 m), and upper slope (200 to 500 m) throughout the GOA wherever there are substrates consisting of cobble, gravel, mud, sandy mud, or muddy sand, as depicted in Figure D-139.

Adults
EFH for adult Pacific ocean perch is the general distribution area for this life stage, located in the lower portion of the water column along the outer shelf (100 to 200 m) and upper slope (200 to 500 m) throughout the GOA wherever there are substrates consisting of cobble, gravel, mud, sandy mud, or muddy sand, as depicted in Figure D-139.

EFH Descriptions for GOA Shortraker and Rougheye Rockfish

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae
EFH for larval shortraker and rougheye rockfish is the general distribution area for this life stage, located in pelagic waters along the entire shelf (0 to 200 m) and slope (200 to 3,000 m) throughout the GOA, as depicted in Figure D-138, General Distribution of Rockfish Larvae.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles—No EFH Description Determined
Insufficient information is available.

Adults
EFH for adult shortraker and rougheye rockfish is the general distribution area for this life stage, located in the lower portion of the water column along the outer shelf (100 to 200 m) and upper slope (200 to 500 m) regions throughout the GOA wherever there are substrates consisting of mud, sand, sandy mud, muddy sand, rock, cobble, and gravel, as depicted in Figure D-140.

EFH Description for GOA Northern Rockfish

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae
EFH for larval northern rockfish is the general distribution area for this life stage, located in pelagic waters along the entire shelf (0 to 200 m) and slope (200 to 3,000 m) throughout the GOA, as depicted in Figure D-138, General Distribution of Rockfish Larvae.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles—No EFH Description Determined
Insufficient information is available.

Adults
EFH for adult northern rockfish is the general distribution area for this life stage, located in the middle and lower portions of the water column along the outer slope (100 to 200 m) and upper slope (200 to 500 m) throughout the GOA wherever there are substrates of cobble and rock, as depicted in Figure D-141.

EFH Description for GOA Thornyhead Rockfish

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae
EFH for larval thornyhead rockfish is the general distribution area for this life stage, located in pelagic waters along the entire shelf (0 to 200 m) and slope (200 to 3,000 m) throughout the GOA, as depicted in Figure D-138, General Distribution of Rockfish Larvae.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for late juvenile Thornyhead rockfish is the general distribution area for this life stage, located in the lower portion of the water column along the middle and outer shelf (50 to 200 m) and upper to lower slope (200 to 1,000 m) throughout the GOA wherever there are substrates of mud, sand, rock, sandy mud, muddy sand, cobble, and gravel, as depicted in Figure D-142.

Adults
EFH for adult Thornyhead rockfish is the general distribution area for this life stage, located in the lower portion of the water column along the middle and outer shelf (50 to 200 m) and upper to lower slope (200 to 1,000 m) throughout the GOA wherever there are substrates of mud, sand, rock, sandy mud, muddy sand, cobble, and gravel, as depicted in Figure D-142.

EFH Definition for GOA Yelloweye Rockfish

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae
EFH for larval yelloweye rockfish is the general distribution area for this life stage, located in pelagic waters along the entire shelf (0 to 200 m) and slope (200 to 3,000 m) throughout the GOA, as depicted in Figure D-138, General Distribution of Rockfish Larvae.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for late juvenile Yelloweye rockfish is the general distribution area for this life stage, located in the lower portion of the water column within bays and island passages and along the inner (0 to 50 m), middle (50 to 100 m), and outer shelf (100 to 200 m) throughout the GOA wherever there are substrates of rock and in areas of vertical relief, such as crevices, overhangs, vertical walls, coral, and larger sponges, as depicted in Figure D-143.

Adults
EFH for adult Yelloweye rockfish is the general distribution area for this life stage, located in the lower portion of the water column within bays and island passages and along the inner shelf (0 to 50 m), middle shelf (50 to 100 m), outer shelf (100 to 200 m) and upper slope (200 to 500 m) throughout the GOA wherever there are substrates of rock and in areas of vertical relief, such as crevices, overhangs, vertical walls, coral, and larger sponges, as depicted in Figure D-143.

EFH Description for GOA Dusky Rockfish

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae
EFH for larval dusky rockfish is the general distribution area for this life stage, located in pelagic waters along the entire shelf (0 to 200 m) and slope (200 to 3,000 m) throughout the GOA, as depicted in Figure D-138, General Distribution of Rockfish Larvae.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles—No EFH Description Determined
Insufficient information is available.

Adults
EFH for adult Dusky rockfish is the general distribution area for this life stage, located in the middle and lower portions of the water column along the outer shelf (100 to 200 m) and upper slope (200 to 500 m) throughout the GOA wherever there are substrates of cobble, rock, and gravel, as depicted in Figure D-144.

EFH Description for GOA Atka Mackerel

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae
EFH for larval atka mackerel is the general distribution area for this life stage, located in epipelagic waters along the shelf (0 to 200 m), upper slope (200 to 500 m), and intermediate slope (500-1000 m) throughout the GOA, as depicted in Figure D-145.

Early Juveniles —No EFH Description Determined
Insufficient information is available.

Late Juveniles—No EFH Description Determined
Insufficient information is available.

Adults
EFH for adult Atka mackerel is the general distribution area for this life stage, located in the entire water column, from sea surface to the sea floor, along the inner (0 to 50 m), middle (50 to 100 m), and outer shelf (100 to 200 m) throughout the GOA wherever there are substrates of gravel and rock and in vegetated areas of kelp, as depicted in Figure D-146.

EFH Description for GOA Sculpins

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae—No EFH Description Determined
Insufficient information is available.

Juveniles
EFH for juvenile sculpins is the general distribution area for this life stage, located in the lower portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), outer shelf (100 to 200 m) and portions of the upper slope (200 to 500 m) throughout the GOA wherever there are substrates of rock, sand, mud, cobble, and sandy mud, as depicted in Figure D-147.

Adults
EFH for adult sculpins is the general distribution area for this life stage, located in the lower portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), outer shelf (100 to 200 m) and portions of the upper slope (200 to 500 m) throughout the GOA wherever there are substrates of rock, sand, mud, cobble, and sandy mud, as depicted in Figure D-147.

EFH Description for GOA Skates

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae—No EFH Description Determined
Insufficient information is available.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles—No EFH Description Determined
Insufficient information is available.

Adults
EFH for adult skates is the general distribution area for this life stage, located in the lower portion of the water column on the shelf (0 to 200 m) and the upper slope (200 to 500 m) throughout the GOA wherever there are of substrates of mud, sand, gravel, and rock, as depicted in Figure D-148.

EFH Description for GOA Sharks

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae—No EFH Description Determined
Insufficient information is available.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles—No EFH Description Determined
Insufficient information is available.

Adults—No EFH Description Determined
Insufficient information is available.

EFH Description for GOA Forage Fish Complex—Eulachon, Capelin, Sand Lance, Sand Fish, Euphausiids, Myctophids, Pholids, Gonostomatids, etc.

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae—No EFH Description Determined
Insufficient information is available.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles—No EFH Description Determined
Insufficient information is available.

Adults. No EFH Description Determined
Insufficient information is available.

EFH Description for GOA Squid

Eggs—No EFH Description Determined
Insufficient information is available.

Young Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for older juvenile squid is the general distribution area for this life stage, located in the entire water column, from the sea surface to sea floor, along the inner (0 to 50 m), middle (50 to 100 m), and outer (200 to 500 m) shelf and the entire slope (500 to 1,000 m) throughout the GOA, as depicted in Figure D-149.

Adults
EFH for adult squid is the general distribution area for this life stage, located in the entire water column, from the sea surface to sea floor, along the inner (0 to 50 m), middle (50 to 100 m), and outer (200 to 500 m) shelf and the entire slope (500 to 1,000 m) throughout the GOA, as depicted in Figure D-149.

EFH Description for GOA Octopus

Eggs—No EFH Description Determined
Insufficient information is available.

Young Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles—No EFH Description Determined
Insufficient information is available.

Adults. No EFH Description Determined
Insufficient information is available.

D.3.2.3 EFH Map Descriptions for GOA Groundfish

Figures D-110 through D-149 show EFH distribution under Alternative 3 for the GOA groundfish species as described in Section D.3.2.2.

D.3.3 Description of Essential Fish Habitat for BSAI King and Tanner Crab

D.3.3.1 EFH Information Levels for BSAI Crab

BSAI Crab Species	Egg	Larvae	Early Juvenile	Late Juvenile	Adult
Red king crab	inferred	x	x	1	1
Blue king crab	inferred	x	x	1	1
Golden king crab	inferred	x	x	1	1
Tanner crab	inferred	x	x	1	1
Snow crab	inferred	x	x	1	1

D.3.3.2 EFH Text Descriptions for BSAI Crab

EFH Description for BSAI Red King Crab

Eggs
Essential fish habitat of the red king crab eggs is inferred form the general distribution of egg-bearing female crab. (See also Adults.)

Larvae—No EFH Description Determined
Insufficient information is available.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for late juvenile red king crab is the general distribution area for this life stage, located in bottom habitats along the inner (0 to 50 m), middle (50 to 100 m), and outer shelf (100 to 200 m) throughout the BSAI wherever there are substrates consisting of rock, cobble, and gravel and biogenic structures such as boltenia, bryozoans, ascidians, and shell hash, as depicted in Figure D-150.

Adults
EFH for adult red king crab is the general distribution area for this life stage, located in bottom habitats along the nearshore (spawning aggregations) and the inner (0 to 50 m), middle (50 to 100 m), and outer shelf (100 to 200 m) throughout the BSAI wherever there are substrates consisting of sand, mud, cobble, and gravel, as depicted in Figure D-150.

EFH Description for BSAI Blue King Crab

Eggs
Essential fish habitat of the blue king crab eggs is inferred from the general distribution of egg-bearing female crab. (See also Adults.)

Larvae—No EFH Description Determined
Insufficient information is available.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for late juvenile blue king crab is the general distribution area for this life stage, located in bottom habitats along the nearshore where there are rocky areas with shell hash and the inner (0 to 50), middle (50 to 100 m), and outer shelf (100 to 200 m) throughout the BSAI wherever there are substrates consisting of rock, cobble, and gravel, as depicted in Figure D-151.

Adults
EFH for adult blue king crab is the general distribution area for this life stage, located in bottom habitats along the inner (0 to 50 m), middle (50 to 100 m), and outer shelf (100 to 200 m) throughout the BSAI wherever there are substrates consisting of sand and mud adjacent to rockier areas and areas of shell hash, as depicted in Figure D-151.

EFH Description for BSAI Golden King Crab

Eggs
Essential fish habitat of golden king crab eggs is inferred from the general distribution of egg-bearing female crab. (See also Adults.)

Larvae—No EFH Description Determined
Insufficient information is available.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for late juvenile golden king crab is the general distribution area for this life stage, located in bottom habitats along the along the upper slope (200 to 500 m), intermediate slope (500 to 1,000 m), lower slope (1,000 to 3,000 m), and basins (more than 3,000 m) of the BSAI where there are high-relief living habitats, such as coral, and vertical substrates, such as boulders, vertical walls, ledges, and deep water pinnacles, as depicted in Figure D-152.

Adults
EFH for adult golden king crab is the general distribution area for this life stage, located in bottom habitats along the along the outer shelf (100 to 200 m), upper slope (200 to 500 m), intermediate slope (500 to 1,000 m), lower slope (1,000 to 3,000 m), and basins (more than 3,000 m) of the BSAI where there are high relief living habitats, such as coral, and vertical substrates such as boulders, vertical walls, ledges, and deep water pinnacles, as depicted in Figure D-152.

EFH Description for BSAI Tanner Crab

Eggs
Essential fish habitat of Tanner crab eggs is inferred form the general distribution of egg-bearing female crab. (See also Adults.)

Larvae—No EFH Description Determined
Insufficient information is available.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for late juvenile Tanner crab is the general distribution area for this life stage, located in bottom habitats along the inner (0 to 50 m), middle (50 to 100 m), and outer shelf (100 to 200 m) throughout the BSAI wherever there are substrates consisting mainly of mud, as depicted in Figure D-153.

Adults
EFH for adult Tanner crab is the general distribution area for this life stage, located in bottom habitats along the inner (0 to 50 m), middle (50 to 100 m), and outer shelf (100 to 200 m) throughout the BSAI wherever there are substrates consisting mainly of mud, as depicted in Figure D-153.

EFH Description for BSAI Snow Crab

Eggs
Essential fish habitat of snow crab eggs is inferred form the general distribution of egg-bearing female crab. (See also Adults.)

Larvae—No EFH Description Determined
Insufficient information is available.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for late juvenile snow crab is the general distribution area for this life stage, located in bottom habitats along the inner (0 to 50 m), middle (50 to 100 m), and outer shelf (100 to 200 m) throughout the BSAI wherever there are substrates consisting mainly of mud, as depicted in Figure D-154.

Adults
EFH for adult snow crab is the general distribution area for this life stage, located in bottom habitats along the inner (0 to 50 m), middle (50 to 100 m), and outer shelf (100 to 200 m) throughout the BSAI wherever there are substrates consisting mainly of mud, as depicted in Figure D-154.

D.3.3.3 EFH Map Descriptions for BSAI Crab

Figures D-150 through D-154 show EFH distribution under Alternative 3 for the BSAI crab species as described in Section D.3.4.2.

D.3.4 Description of Essential Fish Habitat for Alaska Scallops

D.3.4.1 EFH Information Levels for Alaska Scallops

Scallop Species	Eggs	Larvae	Early Juvenile	Late Juvenile	Adult
Weathervane scallop	x	x	x	1	1

D.3.4.2 EFH Text Descriptions for Alaska Scallops

EFH Description for Weathervane Scallops

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae—No EFH Description Determined
Insufficient information is available.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for late juvenile weathervane scallops is the general distribution area for this life stage, located in the sea floor along the middle (50 to 100 m), and outer (100 to 200 m) shelf in concentrated areas of the GOA and BSAI where there are substrates of clay, mud, sand, and gravel that are generally elongated in the direction of current flow, as depicted in Figure D-155.

Adults
EFH for adult weathervane scallops is the general distribution area for this life stage, located in the sea floor along the middle (50 to 100 m) and outer (100 to 200 m) shelf in concentrated areas of the GOA and BSAI where there are substrates of clay, mud, sand, and gravel that are generally elongated in the direction of current flow, as depicted in Figure D-155.

EFH Description for Other Species of Scallops

Information is insufficient or lacking to describe EFH for any life stage of pink, spiny, and rock scallops.

D.3.4.3 EFH Map Descriptions for Weathervane Scallops

Figure D-155 shows EFH distribution under Alternative 3 for weathervane scallops.

D.3.5 Description of Essential Fish Habitat for Alaska Stocks of Pacific Salmon

D.3.5.1 EFH Information Levels for Alaska Stocks of Pacific Salmon

Salmon Species	Freshwater Eggs	Freshwater Larvae and Juveniles	Estuarine Juveniles	Marine Juveniles	Marine Immature and Maturing Adults	Freshwater Adults
Pink	1	1	1	1	1	1
Chum	1	1	1	1	1	1
Sockeye	1	1	1	1	1	1
Chinook	1	1	1	1	1	1
Coho	1	1	1	1	1	1

D.3.5.2 EFH Text Descriptions for Alaska Stocks of Pacific Salmon

EFH Description for Pink Salmon

Freshwater Eggs
EFH for pink salmon eggs is the general distribution area for this life stage, located in gravel substrates in those waters identified by the ADF&G's *Catalogue of Waters Important for the Spawning, Rearing, or Migration of Anadromous Fishes*, as depicted in Figures D-156 through D-161.

Freshwater Larvae and Juveniles
EFH for larval and juvenile pink salmon is the general distribution area for this life stage, located in those waters identified by the ADF&G's *Catalogue of Waters Important for the Spawning, Rearing, or Migration of Anadromous Fishes* and contiguous rearing areas within the boundaries of ordinary high water during the spring, generally migrate in darkness in the upper water column. Fry leave streams in within 15 days and the duration of migration from a stream towards sea may last 2 months, as depicted in Figures D-156 through D-161.

Estuarine Juveniles
Estuarine EFH for juvenile pink salmon is the general distribution area for this life stage, located in estuarine areas, as identified by the salinity transition zone (ecotone) and the mean higher tide line, within nearshore waters and generally present from late April through June, as depicted in Figures D-156 through D-161.

Marine Juveniles
Marine EFH for juvenile pink salmon is the general distribution area for this life stage, located in all marine waters off the coast of Alaska from the mean higher tide line to the 200-nautical mile (nm) limit of the U.S. EEZ, including the GOA, EBS, Chukchi Sea, and Arctic Ocean, as depicted in Figure D-162.

Marine Immature and Maturing Adults
EFH for immature and maturing adult pink salmon is the general distribution area for this life stage, located in marine waters off the coast of Alaska to depths of 200 m and range from the mean higher tide line to the 200-nm limit of the U.S. EEZ, including the GOA, EBS, Chukchi Sea, and Arctic Ocean.

Mature adult pink salmon frequently spawn in intertidal areas and are know to associate with smaller coastal streams, as depicted in Figure D-162.

Freshwater Adults
EFH for pink salmon is the general distribution area for this life stage, located in freshwaters identified by the ADF&G's *Catalogue of Waters Important for the Spawning, Rearing, or Migration of Anadromous Fishes* and wherever there are spawning substrates consisting of medium to course gravel containing less than 15 percent fine sediment (less than 2-mm diameter), 15 to 50 cm in depth from June through September, as depicted in Figures D-156 through D-161.

<u>EFH Description for Chum Salmon</u>

Freshwater Eggs
EFH for chum salmon eggs is the general distribution area for this life stage, located in gravel substrates in those waters identified by the ADF&G's *Catalogue of Waters Important for the Spawning, Rearing, or Migration of Anadromous Fishes*, as depicted in Figures D-163 through D-168.

Freshwater Larvae and Juveniles
EFH for larval and juvenile chum salmon is the general distribution area for this life stage, located in those waters identified by the ADF&G's *Catalogue of Waters Important for the Spawning, Rearing, or Migration of Anadromous Fishes* and contiguous rearing areas within the boundaries of ordinary high water and contiguous rearing areas within the boundaries of ordinary high water during the spring, generally migrate in darkness in the upper water column. Fry leave streams in within 15 days and the duration of migration from a stream towards sea may last 2 months, as depicted in Figures D-163 through D-168.

Estuarine Juveniles
Estuarine EFH for juvenile chum salmon is the general distribution area for this life stage, located in estuarine areas, as identified by the salinity transition zone (ecotone) and the mean higher tide line, within nearshore waters from late April through June, as depicted in Figures D-163 through D-168.

Marine Juveniles
Marine EFH for juvenile chum salmon is the general distribution area for this life stage, located in all marine waters off the coast of Alaska to approximately 50 m in depth from the mean higher tide line to the 200-nm limit of the EEZ, including the GOA, EBS, Chukchi Sea, and Arctic Ocean.Ocean, as depicted in Figure D-169.

Marine Immature and Maturing Adults
EFH for immature and maturing adult chum salmon is the general distribution area for this life stage, located in marine waters off the coast of Alaska to depths of 200 m and ranging from the mean higher tide line to the 200-nm limit of the EEZ, including the GOA, EBS, Chukchi Sea, and Arctic Ocean, as depicted in Figure D-169.

Freshwater Adults
EFH for chum salmon is the general distribution area for this life stage, located in freshwaters identified by the ADF&G's *Catalogue of Waters Important for the Spawning, Rearing, or Migration of Anadromous Fishes* and wherever there are spawning substrates consisting of medium to course gravel containing less than 15 percent fine sediment (less than 2-mm diameter) and finer substrates can be used in upwelling areas of streams and sloughs from June through January, as depicted in Figures D-163 through D-168.

EFH Description for Sockeye Salmon

Freshwater Eggs

EFH for sockeye salmon eggs is the general distribution area for this life stage, located in gravel substrates in those waters identified by the ADF&G's *Catalogue of Waters Important for the Spawning, Rearing, or Migration of Anadromous Fishes*, as depicted in Figures D-170 through D-175.

Freshwater Larvae and Juveniles

EFH for larval and juvenile sockeye salmon is the general distribution area for this life stage, located in those waters identified by the ADF&G's *Catalogue of Waters Important for the Spawning, Rearing, or Migration of Anadromous Fishes* and contiguous rearing areas within the boundaries of ordinary high water. Juvenile sockeye salmon require year-round rearing habitat. Fry generally migrate downstream to a lake or, in systems lacking a freshwater lake, to estuarine and riverine rearing areas for up to 2 years. Fry out migration occurs from approximately April to November and smolts generally migrate during the spring and summer, as depicted in Figures D-170 through D-175.

Estuarine Juveniles

Estuarine EFH for juvenile sockeye salmon is the general distribution area for this life stage, located in estuarine areas, as identified by the salinity transition zone (ecotone) and the mean higher tide line, within nearshore waters. Under-yearling, yearling, and older smolts occupy estuaries from March through early August, as depicted in Figures D-170 through D-175.

Marine Juveniles

Marine EFH for juvenile sockeye salmon is the general distribution area for this life stage, located in all marine waters off the coast of Alaska to depths of 50 m and range from the mean higher tide line to the 200-nm limit of the U.S. EEZ, including the GOA, EBS, Chukchi Sea, and Arctic Ocean from mid-summer until December of their first year at sea, as depicted in Figure D-176.

Marine Immature and Maturing Adults

EFH for immature and maturing adult sockeye salmon is the general distribution area for this life stage, located in marine waters off the coast of Alaska to depths of 200 m and range from the mean higher tide line to the 200-nm limit of the U.S. EEZ, including the GOA, EBS, Chukchi Sea, and Arctic Ocean, as depicted in Figure D-176.

Freshwater Adults

EFH for sockeye salmon is the general distribution area for this life stage, located in freshwaters identified by the ADF&G's *Catalogue of Waters Important for the Spawning, Rearing, or Migration of Anadromous Fishes* and wherever there are spawning substrates consisting of medium to course gravel containing less than 15 percent fine sediment (less than 2-mm diam.) and finer substrates can be used in upwelling areas of streams and sloughs from June through September. Sockeye often spawn in lake substrates, as well as in streams, as depicted in Figures D-170 through D-175.

EFH Description for Chinook Salmon

Freshwater Eggs

EFH for Chinook salmon eggs is the general distribution for this life stage, located in gravel substrates in those waters identified by the ADF&G's *Catalog of Waters Important for the Spawning, Rearing, or Migration of Anadromous Fishes* (ADF&G 1998a) (see Figures D-177 through D-182).

Freshwater Larvae and Juveniles
EFH for larval and juvenile Chinook salmon is the general distribution area for this life stage, located in those waters identified by the ADF&G's *Catalog of Waters Important for the Spawning, Rearing, or Migration of Anadromous Fishes* (ADF&G 1998a) and contiguous rearing areas within the boundaries of ordinary high water. Juvenile Chinook salmon out-migrate from freshwater areas in April toward sea and may spend up to a year in a major tributaries or rivers, such as the Kenai, Yukon, Taku, and Copper Rivers (see Figures D-177 through D-182).

Estuarine Juveniles
Estuarine EFH for juvenile Chinook salmon is the general distribution area for this life stage, located in estuarine areas, as identified by the salinity transition zone (ecotone) and the mean higher tide line, within nearshore waters. Chinook salmon smolts and post-smolt juveniles may be present in these estuarine habitats from April through September (see Figures D-177 through D-182).

Marine Juveniles
Marine EFH for juvenile Chinook salmon is the general distribution area for this life stage, located in all marine waters off the coast of Alaska from the mean higher tide line to the 200-nm limit of the EEZ, including the GOA, EBS, Chukchi Sea, and Arctic Ocean. Juvenile marine Chinook salmon are at this life stage from April until annulus formation in January or February during their first winter at sea (see Figure D-183).

Marine Immature and Maturing Adults
EFH for immature and maturing adult Chinook salmon is the general distribution area for this life stage, located in marine waters off the coast of Alaska and ranging from the mean higher tide line to the 200-nm limit of the U.S. EEZ, including the GOA, EBS, Chukchi Sea, and Arctic Ocean (see Figure D-183).

Freshwater Adults
EFH for adult Chinook salmon is the general distribution area for this life stage, located in fresh waters identified in the ADF&G's *Catalog of Waters Important for the Spawning, Rearing, or Migration of Anadromous Fishes* (ADF&G 1998a) wherever there are spawning substrates consisting of gravels from April through September (see Figures D-177 through D-182).

<u>EFH Description for Coho Salmon</u>

Freshwater Eggs
EFH for coho salmon eggs is the general distribution area for this life stage, located in gravel substrates in those waters identified by the ADF&G's *Catalogue of Waters Important for the Spawning, Rearing, or Migration of Anadromous Fishes*, as depicted in Figures D-184 through D-189.

Freshwater Larvae and Juveniles
EFH for larval and juvenile coho salmon is the general distribution area for this life stage, located in those waters identified by the ADF&G's *Catalogue of Waters Important for the Spawning, Rearing, or Migration of Anadromous Fishes* and contiguous rearing areas within the boundaries of ordinary high water. Fry generally migrate to a lake, slough, or estuary and rear in these areas for up to 2 years, as depicted in Figures D-184 through D-189.

Estuarine Juveniles
Estuarine EFH for juvenile coho salmon is the general distribution area for this life stage, located in estuarine areas, as identified by the salinity transition zone (ecotone) and the mean higher tide line,

within nearshore waters. Juvenile coho salmon require year-round rearing habitat and also migration habitat from April to November to provide access to and from the estuary.

Marine Juveniles
Marine EFH for juvenile coho salmon is the general distribution area for this life stage, located in all marine waters off the coast of Alaska from the mean higher tide line to the 200-nm limit of the U.S. EEZ, including the GOA, EBS, Chukchi Sea, and Arctic Ocean, as depicted in Figure D-190.

Marine Immature and Maturing Adults
EFH for immature and maturing adult coho salmon is the general distribution area for this life stage, located in marine waters off the coast of Alaska to 200 m in depth and range from the mean higher tide line to the 200-nm limit of the U.S. EEZ, including the GOA, EBS, Chukchi Sea, and Arctic Ocean, as depicted in Figure D-190.

Freshwater Adults
EFH for coho salmon is the general distribution area for this life stage, located in freshwaters as identified by the ADF&G's *Catalogue of Waters Important for the Spawning, Rearing, or Migration of Anadromous Fishes* and wherever there are spawning substrates consisting mainly of gravel containing less than 15 percent fine sediment (less than 2-mm diameter) from July to December, as depicted in Figures D-184 through D-189.

D.3.5.3 EFH Map Descriptions for Alaska Stocks of Pacific Salmon

Figures D-155 through D-190 show EFH distribution under Alternative 3 by region for the Alaska stocks of Pacific salmon as described in Section D.3.5.2.

D.4 Alternative 4—Presumed Known Concentration

EFH is described as areas of presumed known concentrations of each life stage of each FMP species. EFH is described using the highest level of information known for each life history stage. If no information is available, then EFH is not described. If information is only available to delineate presence/absence for a particular life history stage, then EFH is described as General Distribution. If information is sufficient to further refine the species population through analysis, then EFH is described as Known Concentrations.

However, for most EFH species in Alaska, the highest level of information known is Level 2 and only described using a refinement of the analysis used in Alternative 3. Sufficient information to describe EFH using even higher levels of information, such as Level 3, is limited to a few life history stages of salmon, and mostly where this habitat has been documented by field observation. In these instances, EFH at Level 3 is for only the freshwater adult life history stage of the salmon species and is described as only those areas which are linked to productivity and/or production rates for that life stage, such as spawning areas. (See list, *Highest Level of Information Available for Each of the 5 EFH Example Species by Life History Stage*, in Section D.4.1.1.)

To develop Level 2 information, the analytical approach used for Alternative 3 was refined to encompass 75 percent of the species population. A percentile of 75 percent was chosen as to be narrower than 95 percent and not as restrictive as the upper two-thirds known concentration percentile (66 percent) as defined in the original EFH EA. The EFH EA in 1999 did not choose known concentration as the preferred alternative, however, discussion is located in the EFH EA document for reference.

Alternative 4 describes EFH for FMP managed species by life history stage using new guidance and definitions from the EFH Final Rule, such as the updated EFH Level of Information definitions. Alterative 4 uses new analytical tools and incorporates recent scientific information for each life history stage from updated scientific habitat assessment reports (see Appendix F). EFH descriptions include both text and a map, if information is available for a species particular life stage. EFH description maps for known concentrations depict EFH in more discrete areas for those species and life stages where information exists to do so.

It is important to note that the major difference between Alternatives 3 and 4, even when higher levels of information are available for a particular species' life stage, is that Alterative 3 describes EFH for the life stage as general distribution, while Alternative 4 describes EFH with the highest level of information.

Objective

The objective is to describe EFH for each particular life stage using best scientific information for only those waters and substrates where the species is concentrated for all instances where data are available to make these determinations.

Methodology

Scientific information sources used in the Alternative 4 analysis focused on two significant fishery data sources, survey (RACE) and catch (NORPAC). Each data set was analyzed for 75 percent of the total cumulated population for the species using GIS. An EFH shape file was developed as the intersection of these data sets.

For BSAI Groundfish, GOA Groundfish, BSAI Crab, and Scallop FMP species, fishery CPUE data from the NMFS Observer database (NORPAC 1990–2001) and NMFS trawl survey data from the Resource Assessment and Conservation Engineering Division (RACE 1987-2002) and, where appropriate,

ADF&G survey data were analyzed to estimate the population distribution of each species. Where this information exists, the area described by this data is EFH. The analyzed EFH data and area are further reviewed by scientific stock assessment authors for accuracy to include any outlying areas not considered and remove any errors in the data or described EFH area.

For Salmon FMP species, the analysis is broken into three parts; marine, nearshore, and freshwater. Marine and Nearshore Salmon EFH will be generally described as to include all marine waters from the mean higher tide line to the limits of the EEZ, since science recognizes salmon are: 1) distributed throughout all marine waters during late juvenile and adult life stages, and 2) found nearshore and along coastal migration corridors as early juvenile life stages outmigrate and adult life stages return to and from freshwater areas, respectively. Freshwater areas used by egg, larvae, and returning adult salmon will be analyzed as those areas indexed by the ADF&G *Catalogue of Waters Important for the Spawning, Rearing, or Migration of Anadromous Fishes* - Pacific salmon species. Freshwater salmon systems are generally defined as those areas above mean higher tide to the upper limits of those freshwater systems supporting salmon and may include contiguous wetland areas, such as those areas hydrologically connected to the main water source via access channels to an adjacent river, stream, lake, pond, etc.

Higher levels of habitat information exist in known spawning areas. Therefore, EFH for adult freshwater salmon is those areas where salmon are known to concentrate or spawn as compared to just those areas where freshwater adult salmon are present.

Rationale

Alternative 4 incorporates the basic rationales for Level 1 information described for Alternative 3. Further, Alternative 4 will describe EFH using higher levels of concentration, if known. Specifically for salmon:

- Concentrations reflect points where fish become concentrated on migration routes from the open ocean to fresh water (e.g., Unimak Pass) and may not indicate exceptional habitats necessary for rearing and maturing;
- Research has identified one area off Prince William Sound to Kodiak Island as a possible area of concentration of chum salmon in summer;
- Freshwater concentrations of salmon reflect locations of specific habitats for spawning, rearing, and migration are patchily distributed on a finer scale (at the reach level) within watersheds;
- Areas of spawning have been identified for a small number of specific river systems that have been intensively surveyed, primarily in Southeast (Region I), Southcentral (Region II); and Southwestern (Region III) Alaska.

D.4.1 Description of Essential Fish Habitat for the Groundfish Resources of the BSAI Regions

D.4.1.1 Highest Known EFH Information Levels for BSAI Groundfish

BSAI Species	Eggs	Larvae	Early Juvenile	Late Juvenile	Adult
Walleye pollock	x	x	x	2	2
Pacific cod	x	x	x	2	2
Yellowfin sole	x	x	x	2	2
Greenland turbot	x	x	x	2	2
Arrowtooth flounder	x	x	x	2	2
Rock sole	x	x	x	2	2
Alaska plaice	x	x	x	2	2
Rex sole	x	x	x	2	2
Dover sole	x	x	x	2	2
Flathead sole	x	x	x	2	2
Sablefish	x	x	x	2	2
Pacific ocean perch	x	x	x	2	2
Shortraker/rougheye rockfish	x	x	x	x	2
Northern rockfish	x	x	x	x	2
Thornyhead rockfish	x	x	x	2	2
Yelloweye rockfish	x	x	x	2	2
Dusky rockfish	x	x	x	x	2
Atka mackerel	x	x	x	x	2
Sculpins	x	x	x	2	2
Skates	x	x	x	x	2
Sharks	x	x	x	2	2
Forage fish complex	x	x	x	2	2
Squid	x	x	x	2	2
Octopus	x	x	x	x	x

x - no information available

D.4.1.2 EFH Text Descriptions for BSAI Groundfish

EFH Description for BSAI Walleye Pollock

Eggs—No EFH Description Determined
Limited information exists to describe walleye pollock egg general distribution. However, the data cannot be analyzed in the same manner as directed by the approach for Alternative 3.

Larvae—No EFH Description Determined
Limited information exists to describe walleye pollock larval general distribution; however, the data cannot be analyzed in the same manner as directed by the approach for Alternative 3.

Early Juveniles—No EFH Description Determined
Limited information exists to describe walleye pollock early juvenile larval general distribution; however, the data cannot be analyzed in the same manner as directed by the approach for Alternative 3.

Late Juveniles
EFH for late juvenile walleye pollock is the known concentration area for this life stage, located in the lower and middle portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf throughout the BSAI, as depicted in Figure D-191. No known preference for substrates exist.

Adults
EFH for adult walleye pollock is the known concentration area for this life stage, located in the lower and middle portion of the water column along the entire shelf (0 to 200 m) and slope (200 to 1,000 m) throughout the BSAI, as depicted in Figure D-191. No known preference for substrates exist.

EFH Description for BSAI Pacific Cod

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae—No EFH Description Determined
Insufficient information is available.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for late juvenile Pacific cod is the known concentration area for this life stage, located in the lower portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf throughout the BSAI wherever there are soft substrate consisting of sand, mud, sandy mud, and muddy sand, as depicted in Figure D-192.

Adults
EFH for adult Pacific cod is the known concentration area for this life stage, located in the lower portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf throughout the BSAI wherever there are soft substrate consisting of sand, mud, sandy mud, muddy sand, and gravel, as depicted in Figure D-192.

EFH Description for BSAI Yellowfin Sole

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae—No EFH Description Determined
Insufficient information is available.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for late juvenile yellowfin sole is the known concentration area for this life stage, located in the lower portion of the water column within nearshore bays and along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf throughout the BSAI wherever there are soft substrates consisting mainly of sand.

Adults
EFH for adult yellowfin sole is the known concentration area for this life stage, located in the lower portion of the water column within nearshore bays and along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf throughout the BSAI wherever there are soft substrates consisting mainly of sand, as depicted in Figure D-193.

EFH Description for BSAI Greenland Turbot

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae—No EFH Description Determined
Insufficient information is available.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for late juvenile Greenland turbot is the known concentration area for this life stage, located in the lower and middle portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf and upper slope (200 to 500 m) throughout the BSAI wherever there are softer substrates consisting of mud and sandy mud, as depicted in Figure D-194.

Adults
EFH for late adult Greenland turbot is the known concentration area for this life stage, located in the lower and middle portion of the water column along the outer shelf (100 to 200 m), upper slope (200 to 500 m), and lower slope (500 to 1,000 m) throughout the BSAI wherever there are softer substrates consisting of mud and sandy mud, as depicted in Figure D-194.

EFH Description for BSAI Arrowtooth Flounder

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae—No EFH Description Determined
Insufficient information is available.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for late juvenile arrowtooth flounder is the known concentration area for this life stage, located in the lower portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf and upper slope (200 to 500 m) throughout the BSAI wherever there are softer substrates consisting of gravel, sand, and mud, as depicted in Figure D-195.

Adults
EFH for adult arrowtooth flounder is the known concentration area for this life stage, located in the lower portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf and upper slope (200 to 500 m) throughout the BSAI wherever there are softer substrates consisting of gravel, sand, and mud, as depicted in Figure D-195.

EFH Description for BSAI Rock Sole

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae—No EFH Description Determined
Insufficient information is available.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for late juvenile rock sole is the known concentration area for this life stage, located in the lower portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf throughout the BSAI wherever there are softer substrates consisting of sand, gravel, and cobble, as depicted in Figure D-196.

Adults
EFH for adult rock sole is the known concentration area for this life stage, located in the lower portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf throughout the BSAI wherever there are softer substrates consisting of sand, gravel, and cobble, as depicted in Figure D-196.

EFH Description for BSAI Alaska Plaice

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae—No EFH Description Determined
Insufficient information is available.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for late juvenile Alaska plaice is the known concentration area for this life stage, located in the lower portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf throughout the BSAI wherever there are softer substrates consisting of sand and mud, as depicted in Figure D-197.

Adults
EFH for adult Alaska plaice is the known concentration area for this life stage, located in the lower portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf throughout the BSAI wherever there are softer substrates consisting of sand and mud, as depicted in Figure D-197.

EFH Description for BSAI Rex Sole

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae—No EFH Description Determined
Insufficient information is available.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for juvenile rex sole is the known concentration area for this life stage, located in the lower portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf throughout the BSAI wherever there are substrates consisting of gravel, sand, and mud, as depicted in Figure D-198.

Adults
EFH for adult rex sole is the known concentration area for this life stage, located in the lower portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf throughout the BSAI wherever there are substrates consisting of gravel, sand, and mud, as depicted in Figure D-198.

EFH Description for BSAI Dover Sole

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae—No EFH Description Determined
Insufficient information is available.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for late juvenile Dover sole is the known concentration area for this life stage, located in the lower portion of the water column along the middle (50 to 100 m) and outer (100 to 200 m) shelf and upper slope (200 to 500 m) throughout the BSAI wherever there are substrates consisting of sand and mud, as depicted in Figure D-199.

Adults
EFH for adult Dover sole is the known concentration area for this life stage, located in the lower portion of the water column along the middle (50 to 100 m) and outer (100 to 200 m) shelf and upper slope (200 to 500 m) throughout the BSAI wherever there are substrates consisting of sand and mud, as depicted in Figure D-199.

EFH Description BSAI Flathead Sole

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae—No EFH Description Determined
Insufficient information is available.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for juvenile flathead sole is the known concentration area for this life stage, located in the lower portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf throughout the BSAI wherever there are softer substrates consisting of sand and mud, as depicted in Figure D-200.

Adults
EFH for adult flathead sole is the known concentration area for this life stage, located in the lower portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf throughout the BSAI wherever there are softer substrates consisting of sand and mud, as depicted in Figure D-200.

EFH Description for BSAI Sablefish

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae—No EFH Description Determined
Insufficient information is available.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for late juvenile sablefish is the known concentration area for this life stage, located in the lower portion of the water column, varied habitats, generally softer substrates, and deep shelf gulleys along the slope (200 to 1,000 m) throughout the BSAI, as depicted in Figure D-201.

Adults
EFH for adult sablefish is the known concentration area for this life stage, located in the lower portion of the water column, varied habitats, generally softer substrates, and deep shelf gulleys along the slope (200 to 1,000 m) throughout the BSAI, as depicted in Figure D-201.

EFH Description for BSAI Pacific Ocean Perch

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae—No EFH Description Determined
Insufficient information is available.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for late juvenile Pacific ocean perch is the known concentration area for this life stage, located in the middle to lower portion of the water column along the inner shelf (1 to 50 m), middle shelf (50 to 100 m), outer shelf (100 to 200 m), and upper slope (200 to 500 m) throughout the BSAI wherever there are substrates consisting of cobble, gravel, mud, sandy mud, or muddy sand, as depicted in Figure D-202.

Adults
EFH for adult Pacific ocean perch is the known concentration area for this life stage, located in the lower portion of the water column along the outer shelf (100 to 200 m) and upper slope (200 to 500 m) throughout the BSAI wherever there are substrates consisting of cobble, gravel, mud, sandy mud, or muddy sand, as depicted in Figure D-202.

EFH Descriptions for BSAI Shortraker and Rougheye Rockfish

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae—No EFH Description Determined
Insufficient information is available.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles—No EFH Description Determined
Insufficient information is available.

Adults
EFH for adult shortraker and rougheye rockfish is the known concentration area for this life stage, located in the lower portion of the water column along the outer shelf (100 to 200 m) and upper slope (200 to 500 m) regions throughout the BSAI wherever there are substrates consisting of mud, sand, sandy mud, muddy sand, rock, cobble, and gravel, as depicted in Figure D-203.

EFH Description for BSAI Northern Rockfish

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae—No EFH Description Determined
Insufficient information is available.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles—No EFH Description Determined
Insufficient information is available.

Adults
EFH for adult northern rockfish is the known concentration area for this life stage, located in s the middle and lower portions of the water column along the outer slope (100 to 200 m) and upper slope (200 to 500 m) throughout the BSAI wherever there are substrates of cobble and rock, as depicted in Figure D-204.

EFH Description for BSAI Thornyhead Rockfish

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae—No EFH Description Determined
Insufficient information is available.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for late juvenile Thornyhead rockfish is the known concentration area for this life stage, located in the lower portion of the water column along the middle and outer shelf (50 to 200 m) and upper to lower slope (200 to 1,000 m) throughout the BSAI wherever there are substrates of mud, sand, rock, sandy mud, muddy sand, cobble, and gravel, as depicted in Figure D-205.

Adults
Level 2. EFH for adult Thornyhead rockfish is the known concentration area for this life stage, located in the lower portion of the water column along the middle and outer shelf (50 to 200 m) and upper to lower slope (200 to 1,000 m) throughout the BSAI wherever there are substrates of mud, sand, rock, sandy mud, muddy sand, cobble, and gravel, as depicted in Figure D-205.

EFH Definition for BSAI Yelloweye Rockfish

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae—No EFH Description Determined
Insufficient information is available.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for late juvenile Yelloweye rockfish is the known concentration area for this life stage, located in the lower portion of the water column within bays and island passages and along the inner (0 to 50 m), middle (50 to 100 m), and outer shelf (100 to 200 m) throughout the GOA wherever there are substrates of rock and in areas of vertical relief, such as crevices, overhangs, vertical walls, coral, and larger sponges, as depicted in Figure D-206.

Adults
EFH for adult Yelloweye rockfish is the known concentration area for this life stage, located in the lower portion of the water column within bays and island passages and along the inner shelf (0 to 50 m), middle shelf (50 to 100 m), outer shelf (100 to 200 m) and upper slope (200 to 500 m) throughout the GOA wherever there are substrates of rock and in areas of vertical relief, such as crevices, overhangs, vertical walls, coral, and larger sponges, as depicted in Figure D-206.

EFH Description for BSAI Dusky Rockfish

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae—No EFH Description Determined
Insufficient information is available.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles—No EFH Description Determined
Insufficient information is available.

Adults
EFH for adult Dusky rockfish is the known concentration area for this life stage, located in the middle and lower portions of the water column along the outer shelf (100 to 200 m) and upper slope (200 to 500 m) throughout the BSAI wherever there are substrates of cobble, rock, and gravel, as depicted in Figure D-207.

EFH Description for BSAI Atka Mackerel

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae—No EFH Description Determined
Insufficient information is available.

Juveniles—No EFH Description Determined
Insufficient information is available.

Adults
EFH for adult Atka mackerel is the known concentration area for this life stage, located in the entire water column, from sea surface to the sea floor, along the inner (0 to 50 m), middle (50 to 100 m), and outer shelf (100 to 200 m) throughout the BSAI wherever there are substrates of gravel and rock and in vegetated areas of kelp, as depicted in Figure D-208.

EFH Description for BSAI Sculpins

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae—No EFH Description Determined
Insufficient information is available.

Juveniles
EFH for adult sculpin is the known concentration area for this life stage, located in the lower portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), outer shelf (100 to 200 m) and portions of the upper slope (200 to 500 m) throughout the BSAI wherever there are substrates of rock, sand, mud, cobble, and sandy mud, as depicted in Figure D-209.

Adults
EFH for adult sculpins is the known concentration area for this life stage, located in the lower portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), outer shelf (100 to 200 m) and portions of the upper slope (200 to 500 m) throughout the BSAI wherever there are substrates of rock, sand, mud, cobble, and sandy mud, as depicted in Figure D-209.

EFH Description for BSAI Skates

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae—No EFH Description Determined
Insufficient information is available.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles—No EFH Description Determined
Insufficient information is available.

Adults
EFH for adult skates is the known concentration area for this life stage, located in the lower portion of the water column on the shelf (0 to 200 m) and the upper slope (200 to 500 m) throughout the BSAI wherever there are of substrates of mud, sand, gravel, and rock, as depicted in Figure D-210.

EFH Description for BSAI Sharks

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae—No EFH Description Determined
Insufficient information is available.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Juveniles
EFH for juvenile sharks is the known concentration area for this life stage, located in the entire water column, from the sea surface to sea floor, and throughout all habitat types along the inner (0 to 50 m), middle (50 to 100 m), and outer (200 to 500 m) shelf and the entire slope (500 to 1,000 m) throughout the BSAI.

Adults
EFH for adult sharks is the known concentration area for this life stage, located in the entire water column, from the sea surface to sea floor, and throughout all habitat types along the inner (0 to 50 m), middle (50 to 100 m), and outer (200 to 500 m) shelf and the entire slope (500 to 1,000 m) throughout the BSAI.

EFH Description for BSAI Forage Fish Complex—Eulachon, Capelin, Sand Lance, Sand Fish, Euphausiids, Myctophids, Pholids, Gonostomatids, etc.

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae—No EFH Description Determined
Insufficient information is available.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles—No EFH Description Determined
Insufficient information is available.

Adults—No EFH Description Determined
Insufficient information is available.

EFH Description for BSAI Squid

Eggs—No EFH Description Determined
Insufficient information is available.

Young Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for older juvenile squid is the known concentration area for this life stage, located in the entire water column, from the sea surface to sea floor, along the inner (0 to 50 m), middle (50 to 100 m), and outer (200 to 500 m) shelf and the entire slope (500 to 1,000 m) throughout the BSAI.

Adults
EFH for adult squid is the known concentration area for this life stage, located in the entire water column, from the sea surface to sea floor, along the inner (0 to 50 m), middle (50 to 100 m), and outer (200 to 500 m) shelf and the entire slope (500 to 1,000 m) throughout the BSAI, as depicted in Figure D-211.

EFH Description for BSAI Octopus

Eggs—No EFH Description Determined
Insufficient information is available.

Young Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles—No EFH Description Determined
Insufficient information is available.

Adults. No EFH Description Determined
Insufficient information is available.

D.4.1.3 EFH Map Descriptions for BSAI Groundfish

Figures D-191 through D-211 show EFH distribution under Alternative 4 for the BSAI groundfish species as described in Section D.4.1.2.

D.4.2 Description of Essential Fish Habitat for the Groundfish Resources of the GOA Region

D.4.2.1 Highest Known EFH Information Levels for GOA Groundfish

GOA Species	Eggs	Larvae	Early Juvenile	Late Juvenile	Adult
Walleye pollock	x	x	x	2	2
Pacific cod	x	x	x	2	2
Yellowfin sole	x	x	x	2	2
Arrowtooth flounder	x	x	x	2	2
Rock sole	x	x	x	2	2
Alaska plaice	x	x	x	2	2
Rex sole	x	x	x	2	2
Dover sole	x	x	x	2	2
Flathead sole	x	x	x	2	2
Sablefish	x	x	x	2	2
Pacific ocean perch	x	x	x	2	2
Shortraker/rougheye rockfish	x	x	x	x	2
Northern rockfish	x	x	x	x	2
Thornyhead rockfish	x	x	x	2	2
Yelloweye rockfish	x	x	x	2	2
Dusky rockfish	x	x	x	x	2
Atka mackerel	x	x	x	x	2
Sculpins	x	x	x	2	2
Skates	x	x	x	x	2
Sharks	x	x	x	2	2
Forage fish complex	x	x	x	2	2
Squid	x	x	x	2	2
Octopus	x	x	x	x	x

x - no information available

D.4.2.2 EFH Text Descriptions for GOA Groundfish

EFH Description for GOA Walleye Pollock

Eggs—No EFH Description Determined
Limited information exists to describe walleye pollock egg general distribution; however, the data cannot be analyzed in the same manner as directed by the approach for Alternative 3.

Larvae—No EFH Description Determined
Limited information exists to describe walleye pollock larval general distribution; however, the data cannot be analyzed in the same manner as directed by the approach for Alternative 3.

Early Juveniles—No EFH Description Determined
Limited information exists to describe walleye pollock early juvenile larval general distribution; however, the data cannot be analyzed in the same manner as directed by the approach for Alternative 3.

Late Juveniles
EFH for late juvenile walleye pollock is the known concentration area for this life stage, located in the lower and middle portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf along the throughout the GOA, as depicted in Figure D-212. No known preference for substrates exist.

Adults
EFH for adult walleye pollock is the known concentration area for this life stage, located in the lower and middle portion of the water column along the entire shelf (0 to 200 m) and slope (200 to 1,000 m) throughout the GOA, as depicted in Figure D-212. No known preference for substrates exist.

EFH Description for GOA Pacific Cod

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae—No EFH Description Determined
Insufficient information is available.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for late juvenile Pacific cod is the known concentration area for this life stage, located in the known concentration area for this life stage, located in the lower portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf throughout the BSAI wherever there are soft substrates consisting of sand, mud, sandy mud, and muddy sand, as depicted in Figure D-213.

Adults
EFH for adult Pacific cod is the known concentration area for this life stage, located in the lower portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf throughout the GOA wherever there are soft substrates consisting of sand, mud, sandy mud, muddy sand, and gravel, as depicted in Figure D-213.

EFH Description for GOA Yellowfin Sole

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae—No EFH Description Determined
Insufficient information is available.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for late juvenile yellowfin sole is the known concentration area for this life stage, located in the lower portion of the water column within nearshore bays and along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf throughout the GOA wherever there are soft substrates consisting mainly of sand, as depicted in Figure D-214.

Adults
EFH for adult yellowfin sole is the known concentration area for this life stage, located in the lower portion of the water column within nearshore bays and along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf throughout the GOA wherever there are soft substrates consisting mainly of sand, as depicted in Figure D-214.

EFH Description for GOA Arrowtooth Flounder

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae—No EFH Description Determined
Insufficient information is available.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for late juvenile arrowtooth flounder is the known concentration area for this life stage, located in the lower portion of the water column along the inner (0 to 50 m), middle (50 to 100 m) and outer (100 to 200 m) shelf and upper slope (200 to 500 m) throughout the GOA wherever there are softer substrates consisting of gravel, sand, and mud, as depicted in Figure D-215.

Adults
EFH for adult arrowtooth flounder is the known concentration area for this life stage, located in the lower portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf and upper slope (200 to 500 m) throughout the GOA wherever there are softer substrates consisting of gravel, sand, and mud, as depicted in Figure D-215.

EFH Description for GOA Rock Sole

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae—No EFH Description Determined
Insufficient information is available.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for late juvenile rock sole i the known concentration area for this life stage, located in s the lower portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf throughout the BSAI wherever there are softer substrates consisting of sand, gravel, and cobble, as depicted in Figure D-216.

Adults
EFH for adult rock sole is the known concentration area for this life stage, located in the lower portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf throughout the BSAI wherever there are softer substrates consisting of sand, gravel, and cobble, as depicted in Figure D-216.

EFH Description for GOA Alaska Plaice

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae—No EFH Description Determined
Insufficient information is available.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for late juvenile Alaska plaice is the known concentration area for this life stage, located in the lower portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf throughout the BSAI wherever there are softer substrates consisting of sand and mud, as depicted in Figure D-217.

Adults
EFH for adult Alaska plaice is the known concentration area for this life stage, located in the lower portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf throughout the BSAI wherever there are softer substrates consisting of sand and mud, as depicted in Figure D-217.

EFH Description for GOA Rex Sole

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae—No EFH Description Determined
Insufficient information is available.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for juvenile rex sole is the known concentration area for this life stage, located in the lower portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf throughout the GOA wherever there are substrates consisting of gravel, sand, and mud, as depicted in Figure D-218.

Adults
EFH for adult rex sole is the known concentration area for this life stage, located in the lower portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf throughout the GOA wherever there are substrates consisting of gravel, sand, and mud, as depicted in Figure D-218.

EFH Description for GOA Dover Sole

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae—No EFH Description Determined
Insufficient information is available.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for late juvenile Dover sole is the known concentration area for this life stage, located in the lower portion of the water column along the middle (50 to 100 m) and outer (100 to 200 m) shelf and upper slope (200 to 500 m) throughout the GOA wherever there are substrates consisting of sand and mud, as depicted in Figure D-219.

Adults
EFH for adult Dover sole is the known concentration area for this life stage, located in the lower portion of the water column along the middle (50 to 100 m) and outer (100 to 200 m) shelf and upper slope (200 to 500 m) throughout the GOA wherever there are substrates consisting of sand and mud, as depicted in Figure D-219.

EFH Description GOA Flathead Sole

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae—No EFH Description Determined
Insufficient information is available.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for juvenile flathead sole is the known concentration area for this life stage, located in the lower portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf throughout the GOA wherever there are softer substrates consisting of sand and mud, as depicted in Figure D-220.

Adults
EFH for adult flathead sole is the known concentration area for this life stage, located in the lower portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf throughout the GOA wherever there are softer substrates consisting of sand and mud, as depicted in Figure D-220.

EFH Description for GOA Sablefish

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae—No EFH Description Determined
Insufficient information is available.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for late juvenile sablefish is the known concentration area for this life stage, located in the lower portion of the water column, varied habitats, generally softer substrates, and deep shelf gulleys along the slope (200 to 1,000 m) throughout the GOA, as depicted in Figure D-221.

Adults
EFH for adult sablefish is the known concentration area for this life stage, located in the lower portion of the water column, varied habitats, generally softer substrates, and deep shelf gulleys along the slope (200 to 1,000 m) throughout the GOA, as depicted in Figure D-221.

EFH Description for GOA Pacific Ocean Perch

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae—No EFH Description Determined
Insufficient information is available.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for late juvenile Pacific ocean perch is the known concentration area for this life stage, located in the middle to lower portion of the water column along the inner shelf (1 to 50 m), middle shelf (50 to 100 m), outer shelf (100 to 200 m), and upper slope (200 to 500 m) throughout the GOA wherever there are substrates consisting of cobble, gravel, mud, sandy mud, or muddy sand, as depicted in Figure D-222.

Adults
EFH for adult Pacific ocean perch is the known concentration area for this life stage, located in the lower portion of the water column along the outer shelf (100 to 200 m) and upper slope (200 to 500 m) throughout the GOA wherever there are substrates consisting of cobble, gravel, mud, sandy mud, or muddy sand, as depicted in Figure D-222.

EFH Descriptions for GOA Shortraker and Rougheye Rockfish

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae—No EFH Description Determined
Insufficient information is available.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles—No EFH Description Determined
Insufficient information is available.

Adults
EFH for adult shortraker and rougheye rockfish is the known concentration area for this life stage, located in the lower portion of the water column along the outer shelf (100 to 200 m) and upper slope (200 to 500 m) regions throughout the GOA wherever there are substrates consisting of mud, sand, sandy mud, muddy sand, rock, cobble, and gravel, as depicted in Figure D-223.

EFH Description for GOA Northern Rockfish

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae—No EFH Description Determined
Insufficient information is available.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles—No EFH Description Determined
Insufficient information is available.

Adults
EFH for adult northern rockfish is the known concentration area for this life stage, located in the middle and lower portions of the water column along the outer slope (100 to 200 m) and upper slope (200 to 500 m) throughout the GOA wherever there are substrates of cobble and rock, as depicted in Figure D-224.

EFH Description for GOA Thornyhead Rockfish

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae—No EFH Description Determined
Insufficient information is available.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for late juvenile Thornyhead rockfish is the known concentration area for this life stage, located in the lower portion of the water column along the middle and outer shelf (50 to 200 m) and upper to lower slope (200 to 1,000 m) throughout the GOA wherever there are substrates of mud, sand, rock, sandy mud, muddy sand, cobble, and gravel, as depicted in Figure D-225.

Adults
EFH for adult Thornyhead rockfish is the known concentration area for this life stage, located in the known concentration area for this life stage, located in the lower portion of the water column along the middle and outer shelf (50 to 200 m) and upper to lower slope (200 to 1,000 m) throughout the GOA wherever there are substrates of mud, sand, rock, sandy mud, muddy sand, cobble, and gravel, as depicted in Figure D-225.

EFH Definition for GOA Yelloweye Rockfish

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae—No EFH Description Determined
Insufficient information is available.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for late juvenile Yelloweye rockfish is the known concentration area for this life stage, located in the lower portion of the water column within bays and island passages and along the inner (0 to 50 m), middle (50 to 100 m), and outer shelf (100 to 200 m) throughout the GOA wherever there are substrates of rock and in areas of vertical relief, such as crevices, overhangs, vertical walls, coral, and larger sponges, as depicted in Figure D-226

Adults
EFH for adult Yelloweye rockfish is the known concentration area for this life stage, located in the lower portion of the water column within bays and island passages and along the inner shelf (0 to 50 m), middle shelf (50 to 100 m), outer shelf (100 to 200 m) and upper slope (200 to 500 m) throughout the GOA wherever there are substrates of rock and in areas of vertical relief, such as crevices, overhangs, vertical walls, coral, and larger sponges, as depicted in Figure D-226.

EFH Description for GOA Dusky Rockfish

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae—No EFH Description Determined
Insufficient information is available.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles—No EFH Description Determined
Insufficient information is available.

Adults
EFH for adult Dusky rockfish is the known concentration area for this life stage, located in the middle and lower portions of the water column along the outer shelf (100 to 200 m) and upper slope (200 to 500 m) throughout the GOA wherever there are substrates of cobble, rock, and gravel, as depicted in Figure D-227.

EFH Description for GOA Atka Mackerel

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae—No EFH Description Determined
Insufficient information is available.

Juveniles—No EFH Description Determined
Insufficient information is available.

Adults
EFH for adult Atka mackerel is the known concentration area for this life stage, located in the entire water column, from sea surface to the sea floor, along the inner (0 to 50 m), middle (50 to 100 m), and outer shelf (100 to 200 m) throughout the GOA wherever there are substrates of gravel and rock and in vegetated areas of kelp, as depicted in Figure D-228.

EFH Description for GOA Sculpins

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae—No EFH Description Determined
Insufficient information is available.

Juveniles
EFH for adult sculpins is the known concentration area for this life stage, located in the lower portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), outer shelf (100 to 200 m) and portions of the upper slope (200 to 500 m) throughout the GOA wherever there are substrates of rock, sand, mud, cobble, and sandy mud, as depicted in Figure D-229.

Adults
EFH for adult sculpins is the known concentration area for this life stage, located in the lower portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), and outer shelf (100 to 200 m) and

portions of the upper slope (200 to 500 m) throughout the GOA wherever there are substrates of rock, sand, mud, cobble, and sandy mud, as depicted in Figure D-229.

EFH Description for GOA Skates

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae—No EFH Description Determined
Insufficient information is available.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles—No EFH Description Determined
Insufficient information is available.

Adults
EFH for adult skates is the known concentration area for this life stage, located in the lower portion of the water column on the shelf (0 to 200 m) and the upper slope (200 to 500 m) throughout the GOA wherever there are of substrates of mud, sand, gravel, and rock, as depicted in Figure D-230.

EFH Description for GOA Sharks

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae—No EFH Description Determined
Insufficient information is available.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Juveniles
EFH for juvenile sharks is the known concentration area for this life stage, located in the entire water column, from the sea surface to sea floor, and throughout all habitat types along the inner (0 to 50 m), middle (50 to 100 m), and outer (200 to 500 m) shelf and the entire slope (500 to 1,000 m) throughout the GOA.

Adults
EFH for adult sharks is the known concentration area for this life stage, located in the entire water column, from the sea surface to sea floor, and throughout all habitat types along the inner (0 to 50 m), middle (50 to 100 m), and outer (200 to 500 m) shelf and the entire slope (500 to 1,000 m) throughout the GOA.

EFH Description for GOA Forage Fish Complex—Eulachon, Capelin, Sand Lance, Sand Fish, Euphausiids, Myctophids, Pholids, Gonostomatids, etc.

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae—No EFH Description Determined
Insufficient information is available.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles—No EFH Description Determined
Insufficient information is available.

Adults. No EFH Description Determined
Insufficient information is available.

EFH Description for GOA Squid

Eggs—No EFH Description Determined
Insufficient information is available.

Young Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for older juvenile squid is the known concentration area for this life stage, located in the entire water column, from the sea surface to sea floor, along the inner (0 to 50 m), middle (50 to 100 m), and outer (200 to 500 m) shelf and the entire slope (500 to 1,000 m) throughout the GOA, as depicted in Figure D-231.

Adults
EFH for adult squid is the known concentration area for this life stage, located in the entire water column, from the sea surface to sea floor, along the inner (0 to 50 m), middle (50 to 100 m), and outer (200 to 500 m) shelf and the entire slope (500 to 1,000 m) throughout the GOA, as depicted in Figure D-231.

EFH Description for GOA Octopus

Eggs—No EFH Description Determined
Insufficient information is available.

Young Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles—No EFH Description Determined
Insufficient information is available.

Adults—No EFH Description Determined
Insufficient information is available.

D.4.2.3 EFH Map Descriptions for GOA Groundfish

Figures D-212 through D-231 show EFH distribution under Alternative 4 for the GOA groundfish species as described in Section D.4.2.2.

D.4.3 Description of Essential Fish Habitat for BSAI King and Tanner Crab

D.4.3.1 Highest Known EFH Information Levels for BSAI Crab

BSAI Crab Species	Egg	Larvae	Early Juvenile	Late Juvenile	Adult
Red king crab	inferred	x	x	2	2
Blue king crab	inferred	x	x	2	2
Golden king crab	inferred	x	x	2	2
Tanner crab	inferred	x	x	2	2
Snow crab	inferred	x	x	2	2

x - no information available

D.4.3.2 EFH Text Descriptions for BSAI Crab

EFH Description for BSAI Red King Crab

Eggs
Essential fish habitat of the red king crab eggs is inferred form the general distribution of egg-bearing female crab. (See also Adults.)

Larvae—No EFH Description Determined
Insufficient information is available.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for late juvenile red king crab is the known concentration area for this life stage, located in bottom habitats along the inner (0 to 50 m), middle (50 to 100 m), and outer shelf (100 to 200 m) throughout the BSAI wherever there are substrates consisting of rock, cobble, and gravel and biogenic structures such as boltenia, bryozoans, ascidians, and shell hash, as depicted in Figure D-232.

Adults
EFH for adult red king crab is the known concentration area for this life stage, located in bottom habitats along the nearshore (spawning aggregations) and the inner (0 to 50 m), middle (50 to 100 m), and outer shelf (100 to 200 m) throughout the BSAI wherever there are substrates consisting of sand, mud, cobble, and gravel, as depicted in Figure D-232.

EFH Description for BSAI Blue King Crab

Eggs
Essential fish habitat of the blue king crab eggs is inferred from the general distribution of egg-bearing female crab. (See also Adults.)

Larvae—No EFH Description Determined
Insufficient information is available.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for late juvenile blue king crab is the known concentration area for this life stage, located in bottom habitats along the nearshore where there are rocky areas with shell hash and the inner (0 to 50 m), middle (50 to 100 m), and outer shelf (100 to 200 m) throughout the BSAI wherever there are substrates consisting of rock, cobble, and gravel, as depicted in Figure D-233.

Adults
EFH for adult blue king crab is the known concentration area for this life stage, located in bottom habitats along the inner (0 to 50 m), middle (50 to 100 m), and outer shelf (100 to 200 m) throughout the BSAI wherever there are substrates consisting of sand and mud adjacent to rockier areas and areas of shell hash, as depicted in Figure D-233.

EFH Description for BSAI Golden King Crab

Eggs
Essential fish habitat of golden king crab eggs is inferred from the general distribution of egg-bearing female crab. (See also Adults.)

Larvae—No EFH Description Determined
Insufficient information is available.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for late juvenile golden king crab is the known concentration area for this life stage, located in bottom habitats along the along the upper slope (200 to 500 m), intermediate slope (500 to 1,000 m), lower slope (1,000 to 3,000 m), and basins (more than 3,000 m) of the BSAI where there are high-relief living habitats, such as coral, and vertical substrates, such as boulders, vertical walls, ledges, and deep water pinnacles, as depicted in Figure D-234.

Adults
EFH for adult golden king crab is the known concentration area for this life stage, located in bottom habitats along the along the outer shelf (100 to 200 m), upper slope (200 to 500 m), intermediate slope (500 to 1,000 m), lower slope (1,000 to 3,000 m), and basins (more than 3,000 m) of the BSAI where there are high-relief living habitats, such as coral, and vertical substrates such as boulders, vertical walls, ledges, and deep water pinnacles, as depicted in Figure D-234.

EFH Description for BSAI Tanner Crab

Eggs
Essential fish habitat of Tanner crab eggs is inferred form the general distribution of egg-bearing female crab. (See also Adults.)

Larvae—No EFH Description Determined
Insufficient information is available.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for late juvenile Tanner crab is the known concentration area for this life stage, located in bottom habitats along the inner (0 to 50 m), middle (50 to 100 m), and outer shelf (100 to 200 m) throughout the BSAI wherever there are substrates consisting mainly of mud, as depicted in Figure D-235.

Adults
EFH for adult Tanner crab is the known concentration area for this life stage, located in bottom habitats along the inner (0 to 50 m), middle (50 to 100 m), and outer shelf (100 to 200 m) throughout the BSAI wherever there are substrates consisting mainly of mud, as depicted in Figure D-235.

EFH Description for BSAI Snow Crab

Eggs
Essential fish habitat of snow crab eggs is inferred form the general distribution of egg-bearing female crab. (See also Adults.)

Larvae—No EFH Description Determined
Insufficient information is available.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for late juvenile snow crab is the known concentration area for this life stage, located in bottom habitats along the inner (0 to 50 m), middle (50 to 100 m), and outer shelf (100 to 200 m) throughout the BSAI wherever there are substrates consisting mainly of mud, as depicted in Figure D-236.

Adults
EFH for adult snow crab is the known concentration area for this life stage, located in bottom habitats along the inner (0 to 50 m), middle (50 to 100 m), and outer shelf (100 to 200 m) throughout the BSAI wherever there are substrates consisting mainly of mud, as depicted in Figure D-236.

D.4.3.3 EFH Map Descriptions for BSAI Crab

Figures D-232 to D-236 show EFH distribution under Alternative 4 for the BSAI crab species as described in Section D.4.3.2.

D.4.4 Description of Essential Fish Habitat for Alaska Scallops

D.4.4.1 Highest Known EFH Information Levels for Alaska Scallops

Scallop Species	Eggs	Larvae	Early Juvenile	Late Juvenile	Adult
Weathervane scallop	x	x	x	2	2

x - no information available

D.4.4.2 EFH Text Descriptions for Alaska Scallops

EFH Description for Weathervane Scallops

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae—No EFH Description Determined
Insufficient information is available.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for late juvenile weathervane scallops is the known concentration area for this life stage, located in the sea floor along the middle (50 to 100 m) and outer (100 to 200 m) shelf in concentrated areas of the GOA and BSAI where there are substrates of clay, mud, sand, and gravel that are generally elongated in the direction of current flow, as depicted in Figure D-237.

Adults
EFH for adult weathervane scallops is the known concentration area for this life stage, located in the sea floor along the middle (50 to 100 m) and outer (100 to 200 m) shelf in concentrated areas of the GOA and BSAI where there are substrates of clay, mud, sand, and gravel that are generally elongated in the direction of current flow, as depicted in Figure D-237.

EFH Description for Other Species of Scallops

Information is insufficient or lacking to describe EFH for any life stage of pink, spiny, and rock scallops.

D.4.4.3 EFH Map Descriptions for Weathervane Scallops

Figure D-237 shows the EFH distribution under Alternative 4 for weathervane scallops.

D.4.5 Description of Essential Fish Habitat for Alaska Stocks of Pacific Salmon

D.4.5.1 Highest Known EFH Information Levels for Alaska Stocks of Pacific Salmon

Salmon Species	Freshwater Eggs	Freshwater Larvae and Juveniles	Estuarine Juveniles	Marine Juveniles	Marine Immature and Maturing Adults	Freshwater Adults
Pink	3	1	1	1	1	3
Chum	3	1	1	1	1	3
Sockeye	3	1	1	1	1	3
Chinook	3	1	1	1	1	3
Coho	3	1	1	1	1	3

D.4.5.2 EFH Text Descriptions for Alaska Stocks of Pacific Salmon

EFH Description for Pink Salmon

Freshwater Eggs
EFH for pink salmon eggs is the known concentration area of adult spawning areas, consisting of gravel substrates in those waters identified by the ADF&G's *Catalogue of Waters Important for the Spawning, Rearing, or Migration of Anadromous Fishes.*

Freshwater Larvae and Juveniles
EFH for larval and juvenile pink salmon is the general distribution area for this life stage, located in those waters identified by the ADF&G's *Catalogue of Waters Important for the Spawning, Rearing, or Migration of Anadromous Fishes* and contiguous rearing areas within the boundaries of ordinary high water during the spring, generally migrate in darkness in the upper water column. Fry leave streams within 1 to 15 days and the duration of migration from a stream towards sea may last 2 months.

Estuarine Juveniles
Estuarine EFH for juvenile pink salmon is the general distribution area for this life stage, located in estuarine areas, as identified by the salinity transition zone (ecotone) and the mean higher tide line, within nearshore waters and generally present from late April through June.

Marine Juveniles
Marine EFH for juvenile pink salmon is the general distribution area for this life stage, located in all marine waters off the coast of Alaska from the mean higher tide line to the 200-nm limit of the U.S. EEZ, including the GOA, EBS, Chukchi Sea, and Arctic Ocean.

Marine Immature and Maturing Adults
EFH for immature and maturing adult pink salmon is the general distribution area for this life stage, located in marine waters off the coast of Alaska to depths of 200 m and range from the mean higher tide line to the 200-nm limit of the U.S. EEZ, including the GOA, EBS, Chukchi Sea, and Arctic Ocean. Mature adult pink salmon frequently spawn in intertidal areas and are known to associate with smaller coastal streams.

Freshwater Adults
EFH for pink salmon is the known concentration of adult spawning areas, located in freshwaters as identified by the ADF&G's *Catalogue of Waters Important for the Spawning, Rearing, or Migration of Anadromous Fishes* and wherever there are spawning substrates consisting of medium to course gravel containing less than 15 percent fine sediment (less than 2-mm diameter), 15 to 50 cm in depth from June through September.

EFH Description for Chum Salmon

Freshwater Eggs
EFH for chum salmon eggs is the known concentration area of adult spawning areas, consisting of gravel substrates in those waters identified by the ADF&G's *Catalogue of Waters Important for the Spawning, Rearing, or Migration of Anadromous Fishes.*

Freshwater Larvae and Juveniles
EFH for larval and juvenile chum salmon is the general distribution area for this life stage, located in those waters identified by the ADF&G's *Catalogue of Waters Important for the Spawning, Rearing, or Migration of Anadromous Fishes* and contiguous rearing areas within the boundaries of ordinary high water and contiguous rearing areas within the boundaries of ordinary high water during the spring. Chum salmon generally migrate in darkness in the upper water column. Fry leave streams within 15 days and the duration of migration from a stream towards sea may last 2 months.

Estuarine Juveniles
Estuarine EFH for juvenile chum salmon is the general distribution area for this life stage, located in estuarine areas, as identified by the salinity transition zone (ecotone) and the mean higher tide line, within nearshore waters from late April through June.

Marine Juveniles
Marine EFH for juvenile chum salmon is the general distribution area for this life stage, located in all marine waters off the coast of Alaska to approximately 50 m in depth from the mean higher tide line to the 200-nm limit of the U.S. EEZ, including the GOA, EBS, Chukchi Sea, and Arctic Ocean.

Marine Immature and Maturing Adults
EFH for immature and maturing adult chum salmon is the general distribution area for this life stage, located in marine waters off the coast of Alaska to depths of 200 m and ranging from the mean higher tide line to the 200-nm limit of the U.S. EEZ, including the GOA, EBS, Chukchi Sea, and Arctic Ocean.

Freshwater Adults
EFH for chum salmon is the known concentration of adult spawning areas, located in freshwaters as identified by the ADF&G's *Catalogue of Waters Important for the Spawning, Rearing, or Migration of Anadromous Fishes* and wherever there are spawning substrates consisting of medium to course gravel containing less than 15 percent fine sediment (less than 2-mm diameter) and finer substrates can be used in upwelling areas of streams and sloughs from June through January.

EFH Description for Sockeye Salmon

Freshwater Eggs
EFH for sockeye salmon eggs is the known concentration area of adult spawning areas, consisting of gravel substrates in those waters identified by the ADF&G's *Catalogue of Waters Important for the Spawning, Rearing, or Migration of Anadromous Fishes.*

Freshwater Larvae and Juveniles
EFH for larval and juvenile sockeye salmon is the general distribution area for this life stage, located in those waters identified by the ADF&G's *Catalogue of Waters Important for the Spawning, Rearing, or Migration of Anadromous Fishes* and contiguous rearing areas within the boundaries of ordinary high water. Juvenile sockeye salmon require year-round rearing habitat. Fry generally migrate downstream to a lake or, in systems lacking a freshwater lake, to estuarine and riverine rearing areas for up to 2 years. Fry outmigration occurs from approximately April to November and smolts generally migrate during the spring and summer.

Estuarine Juveniles
Estuarine EFH for juvenile scokeye salmon is the general distribution area for this life stage, located in estuarine areas, as identified by the salinity transition zone (ecotone) and the mean higher tide line, within nearshore waters. Under-yearling, yearling, and older smolts occupy estuaries from March through early August.

Marine Juveniles
Marine EFH for juvenile sockeye salmon is the general distribution area for this life stage, located in all marine waters off the coast of Alaska to depths of 50 m and range from the mean higher tide line to the 200-nm limit of the U.S. EEZ, including the GOA, EBS, Chukchi Sea, and Arctic Ocean from mid-summer until December of their first year at sea.

Marine Immature and Maturing Adults
EFH for immature and maturing adult sockeye salmon is the general distribution area for this life stage, located in marine waters off the coast of Alaska to depths of 200 m and range from the mean higher tide line to the 200-nm limit of the U.S. EEZ, including the GOA, EBS, Chukchi Sea, and Arctic Ocean.

Freshwater Adults
EFH for sockeye salmon is the known concentration of adult spawning areas, located in freshwaters as identified by the ADF&G's *Catalogue of Waters Important for the Spawning, Rearing, or Migration of Anadromous Fishes* and wherever there are spawning substrates consisting of medium to course gravel containing less than 15 percent fine sediment (less than 2-mm diameter) and finer substrates can be used in upwelling areas of streams and sloughs from June through September. Sockeye often spawn in lake substrates as well as in streams.

<u>EFH Description for Chinook Salmon</u>

Freshwater Eggs
EFH for chinook salmon eggs is the known concentration area of adult spawning areas, consisting of gravel substrates in those waters identified by the ADF&G's *Catalogue of Waters Important for the Spawning, Rearing, or Migration of Anadromous Fishes.*

Freshwater Larvae and Juveniles
EFH for larval and juvenile chinook salmon is the general distribution area for this life stage, located in those waters identified by the ADF&G's *Catalogue of Waters Important for the Spawning, Rearing, or Migration of Anadromous Fishes* and contiguous rearing areas within the boundaries of ordinary high water. Juvenile chinook salmon out migrate from freshwater areas in April toward sea and may spend up to a year in major tributaries or rivers, such as the Kenai, Yukon, Taku, and Copper Rivers.

Estuarine Juveniles

Estuarine EFH for juvenile chinook salmon is the general distribution area for this life stage, located in estuarine areas, as identified by the salinity transition zone (ecotone) and the mean higher tide line, within nearshore waters. Chinook salmon smolts and post-smolt juveniles may be present in these estuarine habitats from April through September.

Marine Juveniles
Marine EFH for juvenile chinook salmon is the general distribution area for this life stage, located in all marine waters off the coast of Alaska from the mean higher tide line to the 200-nm limit of the U.S. EEZ, including the GOA, EBS, Chukchi Sea, and Arctic Ocean. Juvenile marine chinook salmon are at this life stage from April until annulus formation in January or February during their first winter at sea.

Marine Immature and Maturing Adults
EFH for immature and maturing adult chinook salmon is the general distribution area for this life stage, located in marine waters off the coast of Alaska and ranging from the mean higher tide line to the 200-nm limit of the U.S. EEZ, including the GOA, EBS, Chukchi Sea, and Arctic Ocean.

Freshwater Adults
EFH for adult chinook salmon is the known concentration of adult spawning areas, located in freshwaters as identified by the ADF&G's *Catalogue of Waters Important for the Spawning, Rearing, or Migration of Anadromous Fishes* wherever there are spawning substrates consisting of gravels from April through September.

EFH Description for Coho Salmon

Freshwater Eggs
EFH for coho salmon eggs is the known concentration area of adult spawning areas, consisting of gravel substrates in those waters identified by the ADF&G's *Catalogue of Waters Important for the Spawning, Rearing, or Migration of Anadromous Fishes.*

Freshwater Larvae and Juveniles
EFH for larval and juvenile coho salmon is the general distribution area for this life stage, located in those waters identified by the ADF&G's *Catalogue of Waters Important for the Spawning, Rearing, or Migration of Anadromous Fishes* and contiguous rearing areas within the boundaries of ordinary high water. Fry generally migrate to a lake, slough, or estuary and rear in these areas for up to 2 years.

Estuarine Juveniles
Estuarine EFH for juvenile coho salmon is the general distribution area for this life stage, located in estuarine areas, as identified by the salinity transition zone (ecotone) and the mean higher tide line, within nearshore waters. Juvenile coho salmon require year-round rearing habitat and also migration habitat from April to November to provide access to and from the estuary.

Marine Juveniles
Marine EFH for juvenile coho salmon is all marine waters off the coast of Alaska from the mean higher tide line to the 200-nm limit of the U.S. EEZ, including the GOA, EBS, Chukchi Sea, and Arctic Ocean.

Marine Immature and Maturing Adults
EFH for immature and maturing adult coho salmon is the general distribution area for this life stage, located in marine waters off the coast of Alaska to 200 m in depth and range from the mean higher tide line to the 200-nm limit of the U.S. EEZ, including the GOA, EBS, Chukchi Sea, and Arctic Ocean.

Freshwater Adults
EFH for coho salmon is the known concentration of adult spawning areas, located in freshwaters as identified by the ADF&G's *Catalogue of Waters Important for the Spawning, Rearing, or Migration of Anadromous Fishes* and wherever there are spawning substrates consisting mainly of gravel containing less than 15 percent fine sediment (less than 2-mm diameter) from July to December.

D.4.5.3 EFH Map Descriptions for Alaska Stocks of Pacific Salmon

Figures D-238 through D-267 show EFH distribution under Alternative 4 by region for the Alaska stocks of Pacific salmon as described in Section D.4.5.2.

D.5 Alternative 5—Eco-region Strategy

Under this alternative, EFH is described for all life history stages for all species listed within these eight eco-regions (freshwater, nearshore and estuarine, inner and middle shelf, outer shelf, upper slope, middle slope, lower slope, and basin) by characterizing the species that use each eco-region and the habitat types present. The eco-region description of EFH consists of:

- A description of species association within the eco-region, which may lead to finer habitat definitions;
- A description of the range of physical bottom habitat characteristics from available information, if any; and
- An index that links species by habitat type (to satisfy the requirement in the final rule for a species by species EFH description).

Objective

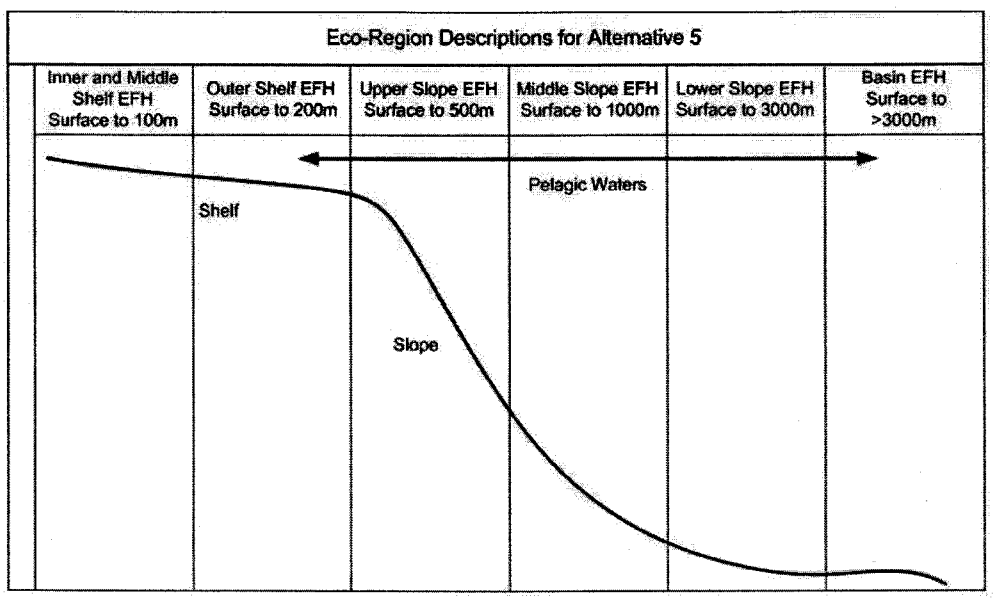
The objective of this alternative is to describe EFH using an ecosystem approach relating the physical, oceanographic, and biological environments to describe EFH as areas containing many species and their associated habitats. EFH Descriptions general distributions, depth, substrate, water circulation patterns, temperature, predator-prey relationships, and other characteristics of the BSAI and GOA for any life stage of the species, if known.

Rationale

This alternative will describe EFH as broad areas for all life stages of the species (discrete areas will not be described as EFH), thereby incorporating uncertainty relative to habitat use by individual FMP species.

Methodology

The North Pacific Ocean, EBS, Chukchi Sea, and Beaufort Sea are broken into three sub-regions as the GOA, EBS, and AI. Each sub-region is analyzed using best scientific information and other sources of information such as the Ecosystem SAFE Reports for each FMP. EFH is then described listing those characteristics of the sub-area.



D.5.1 EFH Text Descriptions for EBS, AI and GOA Eco-Regions

Freshwater Ecosystem

EFH for the freshwater ecosystem is those waters and substrate necessary for all freshwater life history stages of anadromous fish, specifically salmon. Freshwater areas described for salmonids are as identified by the ADF&G's *Catalogue of Waters Important for the Spawning, Rearing, or Migration of Anadromous Fishes.* There are over 15,000 anadromous waters catalogued in this atlas.

Freshwater EFH provides habitat for spawning and rearing of anadromous fish species, including salmon and Eulachon.

EFH Habitat Domain		Freshwater EFH Species	Life History Stage
Ecosystem:	Freshwater	Chinook salmon	Eggs, Juveniles, Adults
Ecoregion:	BSAI; GOA	Coho salmon	Eggs, Juveniles, Adults
Habitat Type:	Riverine;	Pink salmon	Eggs, Juveniles, Adults
Habitat Modifiers		Sockeye salmon	Eggs, Juveniles, Adults
Depth Range:	N/A	Chum salmon	Eggs, Juveniles, Adults
Substrate:	Gravel; sand; mud; cobble;	Eulachon	Eggs, Juveniles, Adults
Structure:	Flow; organic debris;		

Nearshore and Estuarine Ecosystem

EFH in nearshore and estuarine ecosystem is those waters and substrate from the surface to and including the sea floor. EFH species are listed below for this domain. Estuarine areas are those areas measured by water quality parameters such as salinity and meeting the following general criteria:

- a partly enclosed tidal inlet of the sea in which seawater and river water mix to some degree;
- any embayment or partially enclosed body of water that opens to the ocean somewhere and (normally) also has some freshwater inflow; or
- a semi-enclosed coastal body of water that has a free connection with the open sea and within which seawater is measurably diluted with fresh water.

Estuarine EFH provides habitat for juvenile life history stages and adult EFH species, such as rearing areas, migratory corridors, maturing areas, and spawning habitats.

EFH Habitat Domain	
Ecosystem:	Nearshore and Estuarine
Ecoregion:	BSAI; GOA
Habitat Type:	Intertidal
Habitat Modifiers	
Depth Range:	High tide to 3 m
Substrate:	Rock, sand, gravel, mud, organic debris
Structure:	Living structure: eelgrass, kelp, rockweed Non-living bio-structure: shell hash

Roundfish	**Flatfish**	**Rockfish**	**Crab**	**Other**
Pacific Cod 1	Yellowfin sole 1	Thornyhead 1,3	Blue king crab 1,3	Sculpins
*Atka mackerel	Rock sole 1	Yelloweye 1,3	Red king crab 1,3	*Squid
*Walleye pollock	Arrowtooth flounder 1	Dusky 1,3	Snow crab	Octopus
Sablefish		Copper 1,3		*Forage fish
*Chinook salmon 1,2		Northern 1,3		
*Coho salmon 1,2				
*Pink salmon 1,2				
*Sockeye salmon 1,2				
*Chum salmon 1,2				

1 Juvenile area
2 Adult and juvenile seasonal migratory or spawning areas
3 Adult nearshore area

Inner and Middle Shelf Ecosystem

EFH for the inner and middle continental shelf is those waters and substrate, within this depth range, from the surface to and including the benthos. EFH species are listed below for this domain.

EFH for the inner and middle continental shelf is those waters and substrate, within this depth range, from the surface to and including the benthos. EFH species are listed below for this domain.

EFH Habitat Domain	
Ecosystem:	Marine
Ecoregion:	BS/AI; GOA
Habitat Type:	Shallows; Banks
Habitat Modifiers	
Depth Range:	0 to 100 m
Substrate:	Gravel, mud, sand, pebble, rock, organic debris
Structure:	Living structure: eelgrass, kelps, soft corals, anemones, sea pens Non-living bio-structure: shell hash

Roundfish	Flatfish	Rockfish	Crab	Scallop	Other
Pacific Cod	Arrowtooth flounder	Thornyhead	Blue king crab	Weathervane	Sculpins
*Atka mackerel	Flathead sole	Yelloweye	Red king crab		*Squid
*Walleye pollock	Yellowfin sole		Snow crab		*Sharks
	Rock sole				Octopus
*Chinook salmon	Rex sole				*Forage fish
*Coho salmon	Alaska plaice				
*Pink salmon	Dover sole				
*Sockeye salmon					
*Chum salmon					

*Species is pelagic or semi-demersal.

Outer Shelf Ecosystem

EFH for the outer continental shelf is those waters and substrate, within this depth range, from the surface to and including the sea floor. EFH species are listed below for this domain.

EFH Habitat Domain	
Ecosystem:	Marine
Ecoregion:	BSAI; GOA
Habitat Type:	Shallows: Gullies; Flats
Habitat Modifiers	
Depth Range:	0 to 200 m
Substrate:	Gravel, mud, sand, pebble, rock
Structure:	Living structure: soft corals, hard corals, anemones, sea pens Non-living bio-structure: shell hash

Roundfish	Flatfish	Rockfish	Crab	Scallop	Other
Pacific Cod	Arrowtooth flounder	Dusky	Blue king crab	Weathervane	Sculpins
*Atka mackerel	Flathead sole	Pacific ocean perch	Red king crab		*Squid
*Walleye pollock	Yellowfin sole	Thornyhead	Snow crab		*Sharks
	Rock sole	Yelloweye	Golden king crab		Octopus
*Chinook salmon	Rex sole	Northern	Grooved Tanner crab		Forage fish
*Coho salmon		Shortraker	Scarlet king crab		
*Pink salmon	Dover sole	Rougheye	Triangle tanner crab		
*Sockeye salmon	Greenland turbot				
*Chum salmon					

*Species is pelagic or semi-demersal.

Upper Slope Ecosystem

EFH is the upper slope is those waters and substrate, within this depth range, from the surface to and including the benthos. EFH species are listed below for this domain.

EFH Habitat Domain	
Ecosystem:	Marine
Ecoregion:	BSAI; GOA
Habitat Type:	Gullies, Flats, Edge, Deep Gullies, Slopes
Habitat Modifiers	
Depth Range:	0 to 500 m
Substrate:	Gravel, mud, sand, pebble, rock
Structure:	Living structure: soft corals, hard corals, anemones, sea pens Non-living bio-structure: shell hash

Roundfish	Flatfish	Rockfish	Crab	Scallop	Other
Sablefish	Arrowtooth flounder	Thornyhead	Red king crab		Sculpins
*Salmonids Chinook Coho Pink Sockeye Chum	Rex sole	Yelloweye	Snow crab		Skates
*Walleye pollock	Greenland turbot	Dusky	Golden king crab		*Sharks
	Dover sole	Northern	Grooved Tanner crab		Octopus
		Pacific ocean perch	Scarlett king crab		*Forage fish
			Triangle tanner crab		
		Shortraker Rougheye			

*Species is pelagic or semi-demersal.

Middle Slope Ecosystem

EFH for the middle slope is those waters and substrate, within this depth range, from the surface to and including the sea floor. EFH species are listed below for this domain.

EFH Habitat Domain	
Ecosystem:	Marine
Ecoregion:	BSAI; GOA
Habitat Type:	Slopes
Habitat Modifiers	
Depth Range:	0 to 1,000 m
Substrate:	Gravel, mud, sand, pebble, rock
Structure:	Living structure: deep water corals, sea pens Non-living bio-structure: shell hash

Roundfish	Flatfish	Rockfish	Crab	Scallop	Other
Sablefish	Arrowtooth flounder	Thornyhead	Snow crab		Sculpins
*Walleye pollock	Rex sole	Yelloweye	Golden king crab		Skates
*Chinook salmon	Greenland turbot	Dusky	Grooved Tanner crab		*Sharks
*Coho salmon		Northern	Scarlett king crab		Octopus
*Pink salmon		Pacific ocean perch	Triangle tanner crab		*Forage fish
* Sockeye salmon		Shortraker			*Squid
*Chum salmon		Rougheye			

*Species is pelagic or semi-demersal.

Lower Slope Ecosystem

EFH in the lower slope is those waters and substrate, within this depth range, from the surface to and including the sea floor. EFH species are listed below for this domain.

EFH Habitat Domain	
Ecosystem:	Marine
Ecoregion:	BSAI; GOA
Habitat Type:	Slopes
Habitat Modifiers	
Depth Range:	0 to 3,000 m
Substrate:	Gravel, mud, sand, boulder, bedrock
Structure:	Living structure: deep water corals, Non-living bio-structure: shell hash, carcasses

Roundfish	Flatfish	Rockfish	Crab	Scallop	Other
Sablefish	Greenland turbot	Thornyhead	Snow crab		*Squid
*Salmonids Chinook Coho Pink Sockeye Chum			Golden king crab		
*Walleye pollock			Grooved Tanner crab Scarlett king crab Triangle tanner crab		

*Species is pelagic or semi-demersal.

Basin Ecosystem

EFH in the basin is those waters and substrate, within this depth range, from the surface to and including the sea floor. EFH species are listed below for this domain.

EFH Habitat Domain	
Ecosystem:	Marine
Ecoregion:	BSAI; GOA
Habitat Type:	Basin
Habitat Modifiers	
Depth Range:	0 to more than 3,000 m
Substrate:	Mud, boulder, bedrock
Structure:	Living structure: N/A
	Non-living bio-structure: N/A

Roundfish	Flatfish	Rockfish	Crab	Scallop	Other
*Walleye pollock			Snow crab		*Squid
			Golden king crab		
			Grooved Tanner crab		
			Scarlett king crab		
			Triangle tanner crab		

*Species is pelagic or semi-demersal.

D.5.2 EFH Map Descriptions for Alaska Marine Ecosystem, BSAI, Marine Ecosystem, and GOA Marine Ecosystem

Figures D-268 through D-280 show EFH distribution under Alternative 5 for all marine species. There are three maps for each of the six marine eco-regions—one for the Alaska marine ecosystem as a whole, one for the BSAI marine ecosystem, and one for the GOA marine ecosystem.

D.6. Alternative 6—EFH is Described in Waters of the EEZ Only (3 to 200 nm)

EFH will be identified and described using the updated general distribution description criteria (i.e., Alternative 3 language), but would be identified and described only within the EEZ. In other words, the FMPs would be amended to remove any reference to EFH descriptions that include freshwater areas and other areas regulated by the state of Alaska (generally described as those waters between the 0 to 3-nm range from shore plus waters of Upper Cook Inlet, Prince William Sound, and portions of Southeast Alaska).

Objective

The objective of this alternative is to describe EFH for each particular life stage using analytical tools and updated scientific information for only those waters and substrates in the EEZ where the species is known to associate or recruit in scientific survey and commercial fishery catches. EFH is described as 95 percent of the EEZ where the species life stage has been recruited to the survey, investigated through research, officially observed, or reported in a vessel catch log.

Methodology

In addition to scientific information sources analyzed in Alternative 2, the Alternative 3 analysis focused on two significant fishery geographic information data resources: survey (Resource Assessment and Conservation Engineering Division [RACE]) and observer (NORPAC). For adult and late juvenile life stages, each data set was analyzed for 95 percent of the total accumulated population for the species using GIS. For eggs and larvae, the EFH description is based on presence/absence data from surveys (AFSC RACE Matarese 2003). EFH is identified as the areas where eggs and larvae are most commonly encountered in those surveys, which is the best available information regarding habitat use for those life stages. EFH shape files were developed based on these data sets.

For adult and late juvenile life stages of BSAI Groundfish, GOA Groundfish, BSAI Crab, and Scallop FMP species, fishery catch per unit of effort (CPUE) data from the NMFS Observer database (NORPAC, 1990 to 2001) and NMFS trawl survey data from RACE, 1987 to 2002 and, where appropriate, ADF&G survey data were analyzed to estimate the population distribution of each species. Where this information exists, the area described by these data is identified as EFH. The analyzed EFH data and area were further reviewed by scientific stock assessment authors for accuracy. This review ensures that any outlying areas not considered were included, and errors in the data or described EFH area were removed.

For Salmon FMP species, the analysis is broken into three parts: marine, nearshore, and freshwater. Under Alternative 6, only the marine portion of their life stage would be described as EFH. The nearshore areas used by juveniles and freshwater areas used by egg, larvae, and returning adult salmon would not be included as they are not within the EEZ. Marine areas are generally described as those marine waters from the mean higher high tide line seaward to the limits of the EEZ.

Rationale

Similar to Alternatives 2 and 3, Alternative 6 incorporates the basic rationales to describe EFH as General Distribution.

D.6.1 Description of Essential Fish Habitat for the Groundfish Resources of the BSAI Regions (only the EEZ [3 to 200 nm] portion of the BSAI is described as EFH)

D.6.1.1 EFH Information Levels for BSAI Groundfish

BSAI Species	Eggs	Larvae	Early Juvenile	Late Juvenile	Adult
Walleye pollock	1	1	x	1	1
Pacific cod	x	1	x	1	1
Yellowfin sole	x	x	x	1	1
Greenland turbot	1	1	x	1	1
Arrowtooth flounder	x	x	x	1	1
Rock sole	x	1	x	1	1
Alaska plaice	x	x	x	1	1
Rex sole	x	x	x	1	1
Dover sole	x	x	x	1	1
Flathead sole	1	1	x	1	1
Sablefish	x	1	x	1	1
Pacific ocean perch	x	1	x	1	1
Shortraker/rougheye	x	1	x	x	1
Northern rockfish	x	1	x	x	1
Thornyhead rockfish	x	1	x	1	1
Yelloweye rockfish	x	1	x	1	1
Dusky rockfish	x	1	x	x	1
Atka mackerel	x	1	x	x	1
Skates	x	x	x	x	1
Sculpins	x	x	x	1	1
Sharks	x	x	x	1	1
Forage fish complex	x	x	x	x	x
Squid	x	x	x	1	1
Octopus	x	x	x	x	x

x - no information available

D.6.1.2 EFH Text Descriptions for BSAI Groundfish

EFH Description for BSAI Walleye Pollock

Eggs
EFH for walleye pollock eggs is the general distribution area for this life stage, located in pelagic waters along the entire shelf (0 to 200 m), upper slope (200 to 500 m), and intermediate slope (500 to 1,000 m) limited to the EEZ of the BSAI, as depicted in Figure D-281.

Larvae
EFH for larval walleye pollock is the general distribution area for this life stage, located in epipelagic waters along the entire shelf (0 to 200 m), upper slope (200 to 500 m), and intermediate slope (500 to 1,000 m) limited to the EEZ of the BSAI, as depicted in Figure D-282.

Early Juveniles—No EFH Description Determined
Limited information exists to describe walleye pollock early juvenile larval general distribution; however, the data cannot be analyzed in the same manner as directed by the approach for Alternative 3.

Late Juveniles
EFH for late juvenile walleye pollock is the general distribution area for this life stage, located in the lower and middle portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf limited to the EEZ of the BSAI, as depicted in Figure D-283. No known preference for substrates exist.

Adults
EFH for adult walleye pollock is the general distribution area for this life stage, located in the lower and middle portion of the water column along the entire shelf (0 to 200 m) and slope (200 to 1,000 m) limited to the EEZ of the BSAI, as depicted in Figure D-283. No known preference for substrates exist.

EFH Description for BSAI Pacific Cod

Eggs—No EFH Description Determined
Scientific information notes the rare occurrence of Pacific cod eggs in the BSAI.

Larvae—No EFH Description Determined
Insufficient information is available (Figure D-284, revision in process).

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for late juvenile Pacific cod is the general distribution area for this life stage, located in the lower portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf limited to the EEZ of the BSAI wherever there are soft substrates consisting of sand, mud, sandy mud, and muddy sand, as depicted in Figure D-285.

Adults
EFH for adult Pacific cod is the general distribution area for this life stage, located in the lower portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf

limited to the EEZ of the BSAI wherever there are soft substrates consisting of sand, mud, sandy mud, muddy sand, and gravel, as depicted in Figure D-285.

EFH Description for BSAI Yellowfin Sole

Eggs—No EFH Description Determined
Scientific information notes the rare occurrence of yellowfin sole eggs in the BSAI.

Larvae—No EFH Description Determined
Scientific information notes the rare occurrence of larval yellowfin sole in the BSAI.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for late juvenile yellowfin sole is the general distribution area for this life stage, located in the lower portion of the water column along the inner (0 to 50 m), middle (50 to 100 m) and outer (100 to 200 m) shelf limited to the EEZ of the BSAI wherever there are soft substrates consisting mainly of sand, as depicted in Figure D-286.

Adults
EFH for adult yellowfin sole is the general distribution area for this life stage, located in the lower portion of the water column within along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf limited to the EEZ of the BSAI wherever there are soft substrates consisting mainly of sand, as depicted in Figure D-286.

EFH Description for BSAI Greenland Turbot

Eggs
EFH for Greenland turbot eggs is the general distribution area for this life stage, located principally in benthypelagic waters along the outer shelf (100 to 200 m) and slope (200 to 3,000 m) limited to the EEZ of the BSAI in the fall, as depicted in Figure D-287.

Larvae
EFH for larval Greenland turbot is the general distribution area for this life stage, located principally in benthypelagic waters along the outer shelf (100 to 200 m) and slope (200 to 3,000 m) limited to the EEZ of the BSAI and seasonally abundant in the spring, as depicted in Figure D-288.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for late juvenile Greenland turbot is the general distribution area for this life stage, located in the lower and middle portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf and upper slope (200 to 500 m) limited to the EEZ of the BSAI wherever there are softer substrates consisting of mud and sandy mud, as depicted in Figure D-289.

Adults
EFH for late adult Greenland turbot is the general distribution area for this life stage, located in the lower and middle portion of the water column along the outer shelf (100 to 200 m), upper slope (200 to 500 m),

and lower slope (500 to 1,000 m) limited to the EEZ of the BSAI wherever there are softer substrates consisting of mud and sandy mud, as depicted in Figure D-289.

EFH Description for BSAI Arrowtooth Flounder

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae—No EFH Description Determined
Scientific information notes the rare occurrence of larval arrowtooth flounder in the BSAI.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for late juvenile arrowtooth flounder is the general distribution area for this life stage, located in the lower portion of the water column along the inner (0 to 50 m), middle (50 to 100 m) and outer (100 to 200 m) shelf and upper slope (200 to 500 m) limited to the EEZ of the BSAI wherever there are softer substrates consisting of gravel, sand, and mud, as depicted in Figure D-290.

Adults
EFH for adult arrowtooth flounder is the general distribution area for this life stage, located in the lower portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf and upper slope (200 to 500 m) limited to the EEZ of the BSAI wherever there are softer substrates consisting of gravel, sand, and mud, as depicted in Figure D-290.

EFH Description for BSAI Rock Sole

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae
EFH for larval rock sole is the general distribution area for this life stage, located in pelagic waters along the entire shelf (0 to 200 m) and upper slope (200 to 1,000 m) limited to the EEZ of the BSAI, as depicted in Figure D-291.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for late juvenile rock sole is the general distribution area for this life stage, located in the lower portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf limited to the EEZ of the BSAI wherever there are softer substrates consisting of sand, gravel, and cobble, as depicted in Figure D-292.

Adults
EFH for adult rock sole is the general distribution area for this life stage, located in the lower portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf limited to the EEZ of the BSAI wherever there are softer substrates consisting of sand, gravel, and cobble, as depicted in Figure D-292.

EFH Description for BSAI Alaska Plaice

Eggs
EFH for Alaska plaice eggs is the general distribution area for this life stage, located in pelagic waters along the entire shelf (0 to 200 m) and upper slope (200 to 500 m) limited to the EEZ of the BSAI in the spring, as depicted in Figure D-293.

Larvae—No EFH Description Determined
Scientific information notes the rare occurrence of larval Alaska plaice in the BSAI.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for late juvenile Alaska plaice is the general distribution area for this life stage, located in the lower portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf limited to the EEZ of the BSAI wherever there are softer substrates consisting of sand and mud, as depicted in Figure D-294.

Adults
EFH for adult Alaska plaice is the general distribution area for this life stage, located in the lower portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf limited to the EEZ of the BSAI wherever there are softer substrates consisting of sand and mud, as depicted in Figure D-294.

EFH Description for BSAI Rex Sole

Eggs—No EFH Description Determined
Scientific information notes the rare occurrence of rex sole eggs in the BSAI.

Larvae—No EFH Description Determined
Scientific information notes the rare occurrence of larval rex sole in the BSAI.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for juvenile rex sole is the general distribution area for this life stage, located in the lower portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf limited to the EEZ of the BSAI wherever there are substrates consisting of gravel, sand, and mud, as depicted in Figure D-295.

Adults
EFH for adult rex sole is the general distribution area for this life stage, located in the lower portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf limited to the EEZ of the BSAI wherever there are substrates consisting of gravel, sand, and mud, as depicted in Figure D-295.

EFH Description for BSAI Dover Sole

Eggs—No EFH Description Determined
Scientific information notes the rare occurrence of Dover sole eggs in the BSAI.

Larvae—No EFH Description Determined
Scientific information notes the rare occurrence of larval Dover sole in the BSAI.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for late juvenile Dover sole is the general distribution area for this life stage, located in the lower portion of the water column along the middle (50 to 100 m) and outer (100 to 200 m) shelf and upper slope (200 to 500 m) limited to the EEZ of the BSAI wherever there are substrates consisting of sand and mud, as depicted in Figure D-296.

Adults
EFH for adult Dover sole is the general distribution area for this life stage, located in the lower portion of the water column along the middle (50 to 100 m) and outer (100 to 200 m) shelf and upper slope (200 to 500 m) limited to the EEZ of the BSAI wherever there are substrates consisting of sand and mud, as depicted in Figure D-296.

EFH Description BSAI Flathead Sole

Eggs
EFH for flathead sole eggs is the general distribution area for this life stage, located in pelagic waters along the entire shelf (0 to 200 m) and slope (200 to 3,000 m) limited to the EEZ of the BSAI in the spring, as depicted in Figure D-297.

Larvae
EFH for larval flathead sole is the general distribution area for this life stage, located in pelagic waters along the entire shelf (0 to 200 m) and slope (200 to 3,000 m) limited to the EEZ of the BSAI, as depicted in Figure D-298.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for juvenile flathead sole is the general distribution area for this life stage, located in the lower portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf limited to the EEZ of the BSAI wherever there are softer substrates consisting of sand and mud, as depicted in Figure D-299.

Adults
EFH for adult flathead sole is the general distribution area for this life stage, located in the lower portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf limited to the EEZ of the BSAI wherever there are softer substrates consisting of sand and mud, as depicted in Figure D-299.

EFH Description for BSAI Sablefish

Eggs—No EFH Description Determined
Scientific information notes the rare occurrence of sablefish eggs in the BSAI.

Larvae—No EFH Description Determined
Scientific information notes the rare occurrence of larval sablefish in the BSAI (Figure D-300, revision in process).

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for late juvenile sablefish is the general distribution area for this life stage, located in the lower portion of the water column, varied habitats, generally softer substrates, and deep shelf gulleys along the slope (200 to 1,000 m) limited to the EEZ of the BSAI, as depicted in Figure D-301.

Adults
EFH for adult sablefish is the general distribution area for this life stage, located in the lower portion of the water column, varied habitats, generally softer substrates, and deep shelf gulleys along the slope (200 to 1,000 m) limited to the EEZ of the BSAI, as depicted in Figure D-301.

EFH Description for BSAI Pacific Ocean Perch

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae
EFH for larval Pacific ocean perch is the general distribution area for this life stage, located in pelagic waters along the entire shelf (0 to 200 m) and slope (200 to 3,000 m) limited to the EEZ of the BSAI, as depicted in Figure D-302, General Distribution of Rockfish Larvae.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for late juvenile Pacific ocean perch is the general distribution area for this life stage, located in the middle to lower portion of the water column along the inner shelf (1 to 50 m), middle shelf (50 to 100 m), outer shelf (100 to 200 m), and upper slope (200 to 500 m) limited to the EEZ of the BSAI wherever there are substrates consisting of cobble, gravel, mud, sandy mud, or muddy sand, as depicted in Figure D-303.

Adults
EFH for adult Pacific ocean perch is the general distribution area for this life stage, located in the lower portion of the water column along the outer shelf (100 to 200 m) and upper slope (200 to 500 m) limited to the EEZ of the BSAI wherever there are substrates consisting of cobble, gravel, mud, sandy mud, or muddy sand, as depicted in Figure D-303.

EFH Descriptions for BSAI Shortraker and Rougheye Rockfish

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae
EFH for larval shortraker and rougheye rockfish is the general distribution area for this life stage, located in epipelagic waters along the entire shelf (0 to 200 m) and slope (200 to 3,000 m) limited to the EEZ of the BSAI, as depicted in Figure D-302, General Distribution of Rockfish Larvae.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles—No EFH Description Determined
Insufficient information is available.

Adults
EFH for adult shortraker and rougheye rockfish is the general distribution area for this life stage, located in the lower portion of the water column along the outer shelf (100 to 200 m) and upper slope (200 to 500 m) regions limited to the EEZ of the BSAI wherever there are substrates consisting of mud, sand, sandy mud, muddy sand, rock, cobble, and gravel, as depicted in Figure D-304.

EFH Description for BSAI Northern Rockfish

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae
EFH for larval northern rockfish is the general distribution area for this life stage, located in pelagic waters along the entire shelf (0 to 200 m) and slope (200 to 3,000 m) limited to the EEZ of the BSAI, as depicted in Figure D-302, General Distribution of Rockfish Larvae.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles—No EFH Description Determined
Insufficient information is available.

Adults
EFH for adult northern rockfish is the general distribution area for this life stage, located in the middle and lower portions of the water column along the outer slope (100 to 200 m) and upper slope (200 to 500 m) limited to the EEZ of the BSAI wherever there are substrates of cobble and rock, as depicted in Figure D-305.

EFH Description for BSAI Thornyhead Rockfish

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae
EFH for larval thornyhead rockfish is the general distribution area for this life stage, located in epipelagic waters along the outer shelf (100 to 200 m) and slope (200 to 3,000 m) limited to the EEZ of the BSAI, as depicted in Figure D-302, General Distribution of Rockfish Larvae.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for late juvenile Thornyhead rockfish is the lower portion of the water column along the middle and outer shelf (50 to 200 m) and upper to lower slope (200 to 1,000 m) limited to the EEZ of the BSAI wherever there are substrates of mud, sand, rock, sandy mud, muddy sand, cobble, and gravel, as depicted in Figure D-306.

Adults
EFH for adult Thornyhead rockfish is the general distribution area for this life stage, located in the lower portion of the water column along the middle and outer shelf (50 to 200 m) and upper to lower slope (200 to 1,000 m) limited to the EEZ of the BSAI wherever there are substrates of mud, sand, rock, sandy mud, muddy sand, cobble, and gravel, as depicted in Figure D-306.

EFH Definition for BSAI Yelloweye Rockfish

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae
EFH for larval yelloweye rockfish is the general distribution area for this life stage, located in the epipelagic waters along the entire shelf (0 to 200 m) and slope (200 to 3,000 m) limited to the EEZ of the BSAI, as depicted in Figure D-302, General Distribution of Rockfish Larvae.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for late juvenile Yelloweye rockfish is the general distribution area for this life stage, located in the lower portion of the water column within bays and island passages and along the inner (0 to 50 m), middle (50 to 100 m), and outer shelf (100 to 200 m) limited to the EEZ of the GOA wherever there are substrates of rock and in areas of vertical relief, such as crevices, overhangs, vertical walls, coral, and larger sponges, as depicted in Figure D-307.

Adults
EFH for adult Yelloweye rockfish is the general distribution area for this life stage, located in the lower portion of the water column within bays and island passages and along the inner shelf (0 to 50 m), middle shelf (50 to 100 m), outer shelf (100 to 200 m) and upper slope (200 to 500 m) limited to the EEZ of the GOA wherever there are substrates of rock and in areas of vertical relief, such as crevices, overhangs, vertical walls, coral, and larger sponges, as depicted in Figure D-307.

EFH Description for BSAI Dusky Rockfish

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae
EFH for larval dusky rockfish is the general distribution area for this life stage, located in the pelagic waters along the entire shelf (0 to 200 m) and slope (200 to 3,000 m) limited to the EEZ of the BSAI, as depicted in Figure D-302, General Distribution of Rockfish Larvae.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles—No EFH Description Determined
Insufficient information is available.

Adults
EFH for adult Dusky rockfish is the general distribution area for this life stage, located in the middle and lower portions of the water column along the outer shelf (100 to 200 m) and upper slope (200 to 500 m) limited to the EEZ of the BSAI wherever there are substrates of cobble, rock, and gravel, as depicted in Figure D-308.

EFH Description for BSAI Atka Mackerel

Larvae
EFH for larval atka mackerel is the general distribution area for this life stage, located in epipelagic waters along the shelf (0 to 200 m), upper slope (200 to 500 m), and intermediate slope (500-1000 m) limited to the EEZ of the BSAI, as depicted in Figure D-309.

Early Juveniles —No EFH Description Determined
Insufficient information is available.

Late Juveniles—No EFH Description Determined
Insufficient information is available.

Adults
EFH for adult Atka mackerel is the general distribution area for this life stage, located in the entire water column, from sea surface to the sea floor, along the inner (0 to 50 m), middle (50 to 100 m), and outer shelf (100 to 200 m) limited to the EEZ of the BSAI wherever there are substrates of gravel and rock and in vegetated areas of kelp, as depicted in Figure D-310.

EFH Description for BSAI Sculpins

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae—No EFH Description Determined
Insufficient information is available.

Juveniles
EFH for juvenile sculpins is the general distribution area for this life stage, located in the lower portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), outer shelf (100 to 200 m) and portions of the upper slope (200 to 500 m) limited to the EEZ of the BSAI wherever there are substrates of rock, sand, mud, cobble, and sandy mud, as depicted in Figure D-311.

Adults
EFH for adult sculpins is the general distribution area for this life stage, located in the lower portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), outer shelf (100 to 200 m) and portions of the upper slope (200 to 500 m) limited to the EEZ of the BSAI wherever there are substrates of rock, sand, mud, cobble, and sandy mud, as depicted in Figure D-311.

EFH Description for BSAI Skates

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae—No EFH Description Determined
Insufficient information is available.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles—No EFH Description Determined
Insufficient information is available.

Adults
EFH for adult skates is the general distribution area for this life stage, located in the lower portion of the water column on the shelf (0 to 200 m) and the upper slope (200 to 500 m) limited to the EEZ of the BSAI wherever there are of substrates of mud, sand, gravel, and rock, as depicted in Figure D-312.

EFH Description for BSAI Sharks

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae—No EFH Description Determined
Insufficient information is available.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles—No EFH Description Determined
Insufficient information is available.

Adults—No EFH Description Determined
Insufficient information is available.

EFH Description for BSAI Forage Fish Complex—Eulachon, Capelin, Sand Lance, Sand Fish, Euphausiids, Myctophids, Pholids, Gonostomatids, etc.

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae—No EFH Description Determined
Insufficient information is available.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles—No EFH Description Determined
Insufficient information is available.

Adults—No EFH Description Determined
Insufficient information is available.

EFH Description for BSAI Squid

Eggs—No EFH Description Determined
Insufficient information is available.

Young Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for older juvenile squid is the general distribution area for this life stage, located in the entire water column, from the sea surface to sea floor, along the inner (0 to 50 m), middle (50 to 100 m), and outer (200 to 500 m) shelf and the entire slope (500 to 1,000 m) limited to the EEZ of the BSAI, as depicted in Figure D-313.

Adults
EFH for adult squid is the general distribution area for this life stage, located in the entire water column, from the sea surface to sea floor, along the inner (0 to 50 m), middle (50 to 100 m), and outer (200 to 500 m) shelf and the entire slope (500 to 1,000 m) limited to the EEZ of the BSAI, as depicted in Figure D-313.

EFH Description for BSAI Octopus

Eggs—No EFH Description Determined
Insufficient information is available.

Young Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles—No EFH Description Determined
Insufficient information is available.

Adults—No EFH Description Determined
Insufficient information is available.

D.6.1.3 EFH Map Descriptions for BSAI Groundfish

Figures D-281 through D-313 show EFH distribution under Alternative 6 for the BSAI groundfish species as described in Section D.6.1.2.

D.6.2 Description of Essential Fish Habitat for the Groundfish Resources of the GOA Region (only the EEZ [3 to 200 nm] portion of the GOA is described as EFH)

D.6.2.1 EFH Information Levels for GOA Groundfish

GOA Species	Eggs	Larvae	Early Juvenile	Late Juvenile	Adult
Walleye pollock	1	1	x	1	1
Pacific cod	1	1	x	1	1
Yellowfin sole	1	1	x	1	1
Arrowtooth flounder	x	1	x	1	1
Rock sole	x	1	x	1	1
Alaska plaice	1	1	x	1	1
Rex sole	1	1	x	1	1
Dover sole	1	1	x	1	1
Flathead sole	1	1	x	1	1
Sablefish	1	1	x	1	1
Pacific ocean perch	x	1	x	1	1
Shortraker/rougheye	x	1	x	x	1
Northern rockfish	x	1	x	x	1
Thornyhead rockfish	x	1	x	1	1
Yelloweye rockfish	x	1	x	1	1
Dusky rockfish	x	1	x	x	1
Atka mackerel	x	1	x	x	1
Sculpins	x	x	x	1	1
Skates	x	x	x	x	1
Sharks	x	x	x	x	1
Forage fish complex	x	x	x	x	x
Squid	x	x	x	1	1
Octopus	x	x	x	x	x

x - no information available

D.6.2.2 EFH Text Descriptions for GOA Groundfish

EFH Description for GOA Walleye Pollock

Eggs
EFH for walleye pollock eggs is the general distribution area for this life stage, located in pelagic waters along the entire shelf (0 to 200 m), upper slope (200 to 500 m), and intermediate slope (500 to 1,000 m) limited to the EEZ of the GOA, as depicted in Figure D-314.

Larvae
EFH for larval walleye pollock is the general distribution area for this life stage, located in epipelagic waters along the entire shelf (0 to 200 m), upper slope (200 to 500 m), and intermediate slope (500 to 1,000 m) limited to the EEZ of the GOA, as depicted in Figure D-315.

Early Juveniles—No EFH Description Determined
Limited information exists to describe walleye pollock early juvenile larval general distribution; however, the data cannot be analyzed in the same manner as directed by the approach for Alternative 3.

Late Juveniles
EFH for late juvenile walleye pollock is the general distribution area for this life stage, located in the lower and middle portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf along the limited to the EEZ of the GOA, as depicted in Figure D-316. No known preference for substrates exist.

Adults
EFH for adult walleye pollock is the general distribution area for this life stage, located in the lower and middle portion of the water column along the entire shelf (0 to 200 m) and slope (200 to 1,000 m) limited to the EEZ of the GOA, as depicted in Figure D-316. No known preference for substrates exist.

EFH Description for GOA Pacific Cod

Eggs
EFH for Pacific cod eggs is the general distribution area for this life stage, located in pelagic waters along the entire shelf (0 to 200 m) and upper (200 to 500 m) slope limited to the EEZ of the GOA wherever there are soft substrates consisting of mud and sand, as depicted in Figure D-317.

Larvae
EFH for larval Pacific cod is the general distribution area for this life stage, located in pelagic waters along the inner (0 to 50 m) and middle (50 to 100 m) shelf limited to the EEZ of the GOA wherever there are soft substrates consisting of mud and sand, as depicted in Figure D-318.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for late juvenile Pacific cod is the general distribution area for this life stage, located in the lower portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf limited to the EEZ of the BSAI wherever there are soft substrates consisting of sand, mud, sandy mud, and muddy sand, as depicted in Figure D-319.

Adults
EFH for adult Pacific cod is the general distribution area for this life stage, located in the lower portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf limited to the EEZ of the GOA wherever there are soft substrates consisting of sand, mud, sandy mud, muddy sand, and gravel, as depicted in Figure D-319.

EFH Description for GOA Yellowfin Sole

Eggs
EFH for yellowfin sole eggs is the general distribution area for this life stage, located in pelagic waters along the entire shelf (0 to 200 m) and upper (200 to 500 m) slope limited to the EEZ of the GOA, as depicted in Figure D-320.

Larvae
EFH for larval yellowfin sole is the general distribution area for this life stage, located in pelagic waters along the shelf (0 to 200 m) and upper slope (200 to 500 m) limited to the EEZ of the GOA, as depicted in Figure D-321.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for late juvenile yellowfin sole is the general distribution area for this life stage, located in the lower portion of the water column within nearshore bays and along the inner (0 to 50 m), middle (50 to 100 m) and outer (100 to 200 m) shelf limited to the EEZ of the GOA wherever there are soft substrates consisting mainly of sand, as depicted in Figure D-322.

Adults
EFH for adult yellowfin sole is the general distribution area for this life stage, located in the lower portion of the water column within nearshore bays and along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf limited to the EEZ of the GOA wherever there are soft substrates consisting mainly of sand, as depicted in Figure D-322.

EFH Description for GOA Arrowtooth Flounder

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae
EFH for larval arrowtooth flounder is the general distribution area for this life stage, located in pelagic waters along the entire shelf (0 to 200 m) and slope (200 to 3,000 m) limited to the EEZ of the GOA, as depicted in Figure D-323.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for late juvenile arrowtooth flounder is the general distribution area for this life stage, located in the lower portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to

200 m) shelf and upper slope (200 to 500 m) limited to the EEZ of the GOA wherever there are softer substrates consisting of gravel, sand, and mud, as depicted in Figure D-324.

Adults
EFH for adult arrowtooth flounder is the general distribution area for this life stage, located in the lower portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf and upper slope (200 to 500 m) limited to the EEZ of the GOA wherever there are softer substrates consisting of gravel, sand, and mud, as depicted in Figure D-324.

EFH Description for GOA Rock Sole

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae
EFH for larval rock sole is the general distribution area for this life stage, located in pelagic waters along the entire shelf (0 to 200 m) and upper slope (200 to 1,000 m) limited to the EEZ of the GOA, as depicted in Figure D-325.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for late juvenile rock sole is the general distribution area for this life stage, located in the lower portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf limited to the EEZ of the BSAI wherever there are softer substrates consisting of sand, gravel, and cobble, as depicted in Figure D-326.

Adults
EFH for adult rock sole is the general distribution area for this life stage, located in the lower portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf limited to the EEZ of the BSAI wherever there are softer substrates consisting of sand, gravel, and cobble, as depicted in Figure D-326.

EFH Description for GOA Alaska Plaice

Eggs
EFH for Alaska plaice eggs is the general distribution area for this life stage, located in pelagic waters along the entire shelf (0 to 200 m) and upper slope (200 to 500 m) limited to the EEZ of the GOA in the spring, as depicted in Figure D-327.

Larvae
EFH for larval Alaska plaice is the general distribution area for this life stage, located in pelagic waters along the entire shelf (0 to 200 m) and upper slope (200 to 500 m) limited to the EEZ of the GOA, as depicted in Figure D-328.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for late juvenile Alaska plaice is the general distribution area for this life stage, located in the lower portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf limited to the EEZ of the BSAI wherever there are softer substrates consisting of sand and mud, as depicted in Figure D-329.

Adults
EFH for adult Alaska plaice is the general distribution area for this life stage, located in the lower portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf limited to the EEZ of the BSAI wherever there are softer substrates consisting of sand and mud, as depicted in Figure D-329.

EFH Description for GOA Rex Sole

Eggs
EFH for rex sole eggs is the general distribution area for this life stage, located in pelagic waters along the entire shelf (0 to 200 m) and upper slope (200 to 500 m) limited to the EEZ of the GOA in the spring, as depicted in Figure D-330.

Larvae
EFH for larval rex sole is the general distribution area for this life stage, located in pelagic waters along the entire shelf (0 to 200 m) and upper slope (200 to 500 m) limited to the EEZ of the GOA, as depicted in Figure D-331.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for juvenile rex sole is the general distribution area for this life stage, located in the lower portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf limited to the EEZ of the GOA wherever there are substrates consisting of gravel, sand, and mud, as depicted in Figure D-332.

Adults
EFH for adult rex sole is the lower portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf limited to the EEZ of the GOA wherever there are substrates consisting of gravel, sand, and mud, as depicted in Figure D-332.

EFH Description for GOA Dover Sole

Eggs
EFH for Dover sole eggs is the general distribution area for this life stage, located in pelagic waters along the entire shelf (0 to 200 m) and slope (200 to 3,000 m) limited to the EEZ of the GOA, as depicted in Figure D-333.

Larvae
EFH for larval Dover sole is the general distribution area for this life stage, located in pelagic waters along the entire shelf (0 to 200 m) and slope (200 to 3,000 m) limited to the EEZ of the GOA, as depicted in Figure D-334.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for late juvenile Dover sole is the general distribution area for this life stage, located in the lower portion of the water column along the middle (50 to 100 m) and outer (100 to 200 m) shelf and upper slope (200 to 500 m) limited to the EEZ of the GOA wherever there are substrates consisting of sand and mud, as depicted in Figure D-335.

Adults
EFH for adult Dover sole is the general distribution area for this life stage, located in the lower portion of the water column along the middle (50 to 100 m) and outer (100 to 200 m) shelf and upper slope (200 to 500 m) limited to the EEZ of the GOA wherever there are substrates consisting of sand and mud, as depicted in Figure D-335.

EFH Description GOA Flathead Sole

Eggs
EFH for flathead sole eggs is the general distribution area for this life stage, located in pelagic waters along the entire shelf (0 to 200 m) and slope (200 to 3,000 m) limited to the EEZ of the GOA, as depicted in Figure D-336.

Larvae
EFH for larval flathead sole is the general distribution area for this life stage, located in pelagic waters along the entire shelf (0 to 200 m) and slope (200 to 3,000 m) limited to the EEZ of the GOA, as depicted in Figure D-337.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for juvenile flathead sole is the general distribution area for this life stage, located in the lower portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf limited to the EEZ of the GOA wherever there are softer substrates consisting of sand and mud, as depicted in Figure D-338.

Adults
EFH for adult flathead sole is the general distribution area for this life stage, located in the lower portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf limited to the EEZ of the GOA wherever there are softer substrates consisting of sand and mud, as depicted in Figure D-338.

EFH Description for GOA Sablefish

Eggs
EFH for sablefish eggs is the general distribution area for this life stage, located in deeper waters along the slope (200 to 3,000 m) limited to the EEZ of the GOA, as depicted in Figure D-339.

Larvae
EFH for larval sablefish is the general distribution area for this life stage, located in epipelagic waters along the middle shelf (50 to 100 m), outer shelf (100 to 200 m), and slope (200 to 3,000 m) limited to the EEZ of the GOA, as depicted in Figure D-340.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for late juvenile sablefish is the general distribution area for this life stage, located in the lower portion of the water column, varied habitats, generally softer substrates, and deep shelf gulleys along the slope (200 to 1,000 m) limited to the EEZ of the GOA, as depicted in Figure D-341.

Adults
EFH for adult sablefish is the general distribution area for this life stage, located in the lower portion of the water column, varied habitats, generally softer substrates, and deep shelf gulleys along the slope (200 to 1,000 m) limited to the EEZ of the GOA, as depicted in Figure D-341.

EFH Description for GOA Pacific Ocean Perch

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae—No EFH Description Determined
Insufficient information is available.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for late juvenile Pacific ocean perch is the general distribution area for this life stage, located in the middle to lower portion of the water column along the inner shelf (0 to 50 m), middle shelf (50 to 100 m), outer shelf (100 to 200 m), and upper slope (200 to 500 m) limited to the EEZ of the GOA wherever there are substrates consisting of cobble, gravel, mud, sandy mud, or muddy sand, as depicted in Figure D-342.

Adults
EFH for adult Pacific ocean perch is the general distribution area for this life stage, located in the lower portion of the water column along the outer shelf (100 to 200 m) and upper slope (200 to 500 m) limited to the EEZ of the GOA wherever there are substrates consisting of cobble, gravel, mud, sandy mud, or muddy sand, as depicted in Figure D-342.

EFH Descriptions for GOA Shortraker and Rougheye Rockfish

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae
EFH for larval shortraker and rougheye rockfish is the general distribution area for this life stage, located in pelagic waters along the entire shelf (0 to 200 m) and slope (200 to 3,000 m) limited to the EEZ of the GOA, as depicted in Figure D-343, General Distribution of Rockfish Larvae.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles—No EFH Description Determined
Insufficient information is available.

Adults
EFH for adult shortraker and rougheye rockfish is the general distribution area for this life stage, located in the lower portion of the water column along the outer shelf (100 to 200 m) and upper slope (200 to 500 m) regions limited to the EEZ of the GOA wherever there are substrates consisting of mud, sand, sandy mud, muddy sand, rock, cobble, and gravel, as depicted in Figure D-344.

EFH Description for GOA Northern Rockfish

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae
EFH for larval northern rockfish is the general distribution area for this life stage, located in pelagic waters along the entire shelf (0 to 200 m) and slope (200 to 3,000 m) limited to the EEZ of the GOA, as depicted in Figure D-343, General Distribution of Rockfish Larvae.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles—No EFH Description Determined
Insufficient information is available.

Adults
EFH for adult northern rockfish is the general distribution area for this life stage, located in the middle and lower portions of the water column along the outer slope (100 to 200 m) and upper slope (200 to 500 m) limited to the EEZ of the GOA wherever there are substrates of cobble and rock, as depicted in Figure D-345.

EFH Description for GOA Thornyhead Rockfish

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae
EFH for larval thornyhead rockfish is the general distribution area for this life stage, located in pelagic waters along the entire shelf (0 to 200 m) and slope (200 to 3,000 m) limited to the EEZ of the GOA, as depicted in Figure D-343, General Distribution of Rockfish Larvae.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for late juvenile thornyhead rockfish is the general distribution area for this life stage, located in the lower portion of the water column along the middle and outer shelf (50 to 200 m) and upper to lower slope (200 to 1,000 m) limited to the EEZ of the GOA wherever there are substrates of mud, sand, rock, sandy mud, muddy sand, cobble, and gravel, as depicted in Figure D-346.

Adults
EFH for adult thornyhead rockfish is the general distribution area for this life stage, located in the lower portion of the water column along the middle and outer shelf (50 to 200 m) and upper to lower slope (200 to 1,000 m) limited to the EEZ of the GOA wherever there are substrates of mud, sand, rock, sandy mud, muddy sand, cobble, and gravel, as depicted in Figure D-346.

EFH Definition for GOA Yelloweye Rockfish

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae
EFH for larval yelloweye rockfish is the general distribution area for this life stage, located in pelagic waters along the entire shelf (0 to 200 m) and slope (200 to 3,000 m) limited to the EEZ of the GOA, as depicted in Figure D-343, General Distribution of Rockfish Larvae.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for late juvenile yelloweye rockfish is the general distribution area for this life stage, located in the lower portion of the water column within bays and island passages and along the inner (0 to 50 m), middle (50 to 100 m), and outer shelf (100 to 200 m) limited to the EEZ of the GOA wherever there are substrates of rock and in areas of vertical relief, such as crevices, overhangs, vertical walls, coral, and larger sponges, as depicted in Figure D-347.

Adults
EFH for adult yelloweye rockfish is the general distribution area for this life stage, located in the lower portion of the water column within bays and island passages and along the inner shelf (0 to 50 m), middle shelf (50 to 100 m), outer shelf (100 to 200 m) and upper slope (200 to 500 m) limited to the EEZ of the GOA wherever there are substrates of rock and in areas of vertical relief, such as crevices, overhangs, vertical walls, coral, and larger sponges, as depicted in Figure D-347.

EFH Description for GOA Dusky Rockfish

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae
EFH for larval dusky rockfish is the general distribution area for this life stage, located in pelagic waters along the entire shelf (0 to 200 m) and slope (200 to 3,000 m) limited to the EEZ of the GOA, as depicted in Figure D-343, General Distribution of Rockfish Larvae.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles—No EFH Description Determined
Insufficient information is available.

Adults
EFH for adult Dusky rockfish is the general distribution area for this life stage, located in the middle and lower portions of the water column along the outer shelf (100 to 200 m) and upper slope (200 to 500 m) limited to the EEZ of the GOA wherever there are substrates of cobble, rock, and gravel, as depicted in Figure D-348.

EFH Description for GOA Atka Mackerel

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae
EFH for larval atka mackerel is the general distribution area for this life stage, located in epipelagic waters along the shelf (0 to 200 m), upper slope (200 to 500 m), and intermediate slope (500-1000 m) limited to the EEZ of the GOA, as depicted in Figure D-349.

Early Juveniles —No EFH Description Determined
Insufficient information is available.

Late Juveniles—No EFH Description Determined
Insufficient information is available.

Adults
EFH for adult Atka mackerel is the general distribution area for this life stage, located in the entire water column, from sea surface to the sea floor, along the inner (0 to 50 m), middle (50 to 100 m), and outer shelf (100 to 200 m) limited to the EEZ of the GOA wherever there are substrates of gravel and rock and in vegetated areas of kelp, as depicted in Figure D-350.

EFH Description for GOA Sculpins

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae—No EFH Description Determined
Insufficient information is available.

Juveniles
EFH for juvenile sculpins is the general distribution area for this life stage, located in the lower portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), outer shelf (100 to 200 m) and

Larvae—No EFH Description Determined
Insufficient information is available.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles—No EFH Description Determined
Insufficient information is available.

Adults—No EFH Description Determined
Insufficient information is available.

EFH Description for GOA Squid

Eggs—No EFH Description Determined
Insufficient information is available.

Young Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for older juvenile squid is the general distribution area for this life stage, located in the entire water column, from the sea surface to sea floor, along the inner (0 to 50 m), middle (50 to 100 m), and outer (200 to 500 m) shelf and the entire slope (500 to 1,000 m) limited to the EEZ of the GOA, as depicted in Figure D-353.

Adults
EFH for adult squid is the general distribution area for this life stage, located in the entire water column, from the sea surface to sea floor, along the inner (0 to 50 m), middle (50 to 100 m), and outer (200 to 500 m) shelf and the entire slope (500 to 1,000 m) limited to the EEZ of the GOA, as depicted in Figure D-353.

EFH Description for GOA Octopus

Eggs—No EFH Description Determined
Insufficient information is available.

Young Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles—No EFH Description Determined
Insufficient information is available.

Adults. No EFH Description Determined
Insufficient information is available.

D.6.2.3 EFH Map Descriptions for GOA Groundfish

Figures D-314 through D-353 show EFH distribution under Alternative 6 for the GOA groundfish species as described in Section D.6.2.2.

D.6.3 Description of Essential Fish Habitat for BSAI King and Tanner Crab (only the EEZ [3 to 200 nm] portion of the BSAI is described as EFH)

D.6.3.1 EFH Information Levels for BSAI Crab

BSAI Crab Species	Egg	Larvae	Early Juvenile	Late Juvenile	Adult
Red king crab	inferred	x	x	1	1
Blue king crab	inferred	x	x	1	1
Golden king crab	inferred	x	x	1	1
Tanner crab	inferred	x	x	1	1
Snow crab	inferred	x	x	1	1

x - no information available

D.6.3.2 EFH Text Descriptions for BSAI Crab

EFH Description for BSAI Red King Crab

Eggs
Essential fish habitat of the red king crab eggs is inferred form the general distribution of egg-bearing female crab. (See also Adults.)

Larvae—No EFH Description Determined
Insufficient information is available.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for late juvenile red king crab is the general distribution area for this life stage, located in bottom habitats along the inner (0 to 50 m), middle (50 to 100 m), and outer shelf (100 to 200 m) limited to the EEZ of the BSAI wherever there are substrates consisting of rock, cobble, and gravel and biogenic structures such as boltenia, bryozoans, ascidians, and shell hash, as depicted in Figure D-354.

Adults
EFH for adult red king crab is the general distribution area for this life stage, located in bottom habitats along the inner (0 to 50 m), middle (50 to 100 m), and outer shelf (100 to 200 m) limited to the EEZ of the BSAI wherever there are substrates consisting of sand, mud, cobble, and gravel, as depicted in Figure D-354.

EFH Description for BSAI Blue King Crab

Eggs
Essential fish habitat of the blue king crab eggs is inferred from the general distribution of egg-bearing female crab. (See also Adults.)

Larvae—No EFH Description Determined
Insufficient information is available.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for late juvenile blue king crab is the general distribution area for this life stage, located in bottom habitats along the nearshore where there are rocky areas with shell hash and the inner (0 to 50 m), middle (50 to 100 m), and outer shelf (100 to 200 m) limited to the EEZ of the BSAI wherever there are substrates consisting of rock, cobble, and gravel, as depicted in Figure D-355.

Adults
EFH for adult blue king crab is the general distribution area for this life stage, located in bottom habitats along the inner (0 to 50 m), middle (50 to 100 m), and outer shelf (100 to 200 m) limited to the EEZ of the BSAI wherever there are substrates consisting of sand and mud adjacent to rockier areas and areas of shell hash, as depicted in Figure D-355.

EFH Description for BSAI Golden King Crab

Eggs
Essential fish habitat of golden king crab eggs is inferred from the general distribution of egg-bearing female crab. (See also Adults.)

Larvae—No EFH Description Determined
Insufficient information is available.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for late juvenile golden king crab is the general distribution area for this life stage, located in bottom habitats along the along the upper slope (200 to 500 m), intermediate slope (500 to 1,000 m), lower slope (1,000 to 3,000 m), and basins (more than 3,000 m) of the BSAI where there are high-relief living habitats, such as coral, and vertical substrates, such as boulders, vertical walls, ledges, and deep water pinnacles, as depicted in Figure D-356.

Adults
EFH for adult golden king crab is the general distribution area for this life stage, located in bottom habitats along the along the outer shelf (100 to 200 m), upper slope (200 to 500 m), intermediate slope (500 to 1,000 m), lower slope (1,000 to 3,000 m), and basins (more than 3,000 m) of the BSAI where there are high-relief living habitats, such as coral, and vertical substrates such as boulders, vertical walls, ledges, and deep water pinnacles, as depicted in Figure D-356.

EFH Description for BSAI Tanner Crab

Eggs
Essential fish habitat of Tanner crab eggs is inferred form the general distribution of egg-bearing female crab. (See also Adults.)

Larvae—No EFH Description Determined
Insufficient information is available.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for late juvenile Tanner crab is the general distribution area for this life stage, located in the general distribution area for this life stage, located in bottom habitats along the inner (0 to 50 m), middle (50 to 100 m), and outer shelf (100 to 200 m) limited to the EEZ of the BSAI wherever there are substrates consisting mainly of mud, as depicted in Figure D-357.

Adults
EFH for adult Tanner crab is the general distribution area for this life stage, located in bottom habitats along the inner (0 to 50 m), middle (50 to 100 m), and outer shelf (100 to 200 m) limited to the EEZ of the BSAI wherever there are substrates consisting mainly of mud, as depicted in Figure D-357.

EFH Description for BSAI Snow Crab

Eggs
Essential fish habitat of snow crab eggs is inferred form the general distribution of egg-bearing female crab. (See also Adults.)

Larvae—No EFH Description Determined
Insufficient information is available.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for late juvenile snow crab is the general distribution area for this life stage, located in bottom habitats along the inner (0 to 50 m), middle (50 to 100 m), and outer shelf (100 to 200 m) limited to the EEZ of the BSAI wherever there are substrates consisting mainly of mud, as depicted in Figure D-358.

Adults
EFH for adult snow crab is the general distribution area for this life stage, located in bottom habitats along the inner (0 to 50 m), middle (50 to 100 m), and outer shelf (100 to 200 m) limited to the EEZ of the BSAI wherever there are substrates consisting mainly of mud, as depicted in Figure D-358.

D.6.3.3 EFH Map Descriptions for BSAI Crab

Figures D-354 through D-358 show EFH distribution under Alternative 6 for the crab species as described in Section D.6.4.2.

D.6.4 Description of Essential Fish Habitat for Alaska Scallops (only the EEZ [3 to 200 nm] portion of the BSAI and GOA is described as EFH)

D.6.4.1 EFH Information Levels for Alaska Scallops

Scallop Species	Eggs	Larvae	Early Juvenile	Late Juvenile	Adult
Weathervane scallop	x	x	x	2	2

x - no information available

D.6.4.2 EFH Text Descriptions for Alaska Scallops

<u>EFH Description for Weathervane Scallops</u>

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae—No EFH Description Determined
Insufficient information is available.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for late juvenile weathervane scallops is the general distribution area for this life stage, located in the sea floor along the middle (50 to 100 m) and outer (100 to 200 m) shelf in concentrated areas of the GOA and BSAI and limited to the EEZ where there are substrates of clay, mud, sand, and gravel that are generally elongated in the direction of current flow.

Adults
EFH for adult weathervane scallops is the general distribution area for this life stage, located in the sea floor along the middle (50 to 100 m) and outer (100 to 200 m) shelf in concentrated areas of the GOA and BSAI and limited to the EEZ where there are substrates of clay, mud, sand, and gravel that are generally elongated in the direction of current flow.

<u>EFH Description for Other species of Scallops</u>

Information is insufficient or lacking to describe EFH for any life stage of pink, spiny, and rock scallops.

D.6.4.3 EFH Map Descriptions for Weathervane Scallops

Figure D-359 shows the EFH distribution under Alternative 6 for weathervane scallops.

D.6.5 Description of Essential Fish Habitat for Alaska Stocks of Pacific Salmon (only the EEZ [3 to 200 nm] portion of this area is described as EFH)

D.6.5.1 EFH Information Levels for Alaska Stocks of Pacific Salmon

Salmon Species	Freshwater Eggs	Freshwater Larvae and Juveniles	Estuarine Juveniles	Marine Juveniles	Marine Immature and Maturing Adults	Freshwater Adults
Pink	x	x	x	1	1	x
Chum	x	x	x	1	1	x
Sockeye	x	x	x	1	1	x
Chinook	x	x	x	1	1	x
Coho	x	x	x	1	1	x

x - life stage not found in areas of the EEZ (3 to 200 nm)

D.6.5.2 EFH Text Descriptions for Alaska Stocks of Pacific Salmon

<u>EFH Description for Pink Salmon</u>

Freshwater Eggs
No EFH description determined (all outside of EEZ area).

Freshwater Larvae and Juveniles
No EFH description determined (all outside of EEZ area).

Estuarine Juveniles
No EFH description determined (all outside of EEZ area).

Marine Juveniles
Marine EFH for juvenile pink salmon is the general distribution area for this life stage, located in all marine waters off the coast of Alaska (more than 3 nm) extending to the 200-nm limit of the U.S. EEZ, including the GOA, EBS, Chukchi Sea, and Arctic Ocean, as depicted in Figure D-360.

Marine Immature and Maturing Adults
EFH for immature and maturing adult pink salmon is the general distribution area for this life stage, located in marine waters off the coast of Alaska (more than 3 nm) to depths of 200 m extending to the 200-nm limit of the U.S. EEZ, including the GOA, EBS, Chukchi Sea, and Arctic Ocean, as depicted in Figure D-360.

Freshwater Adults
No EFH description determined (all outside of EEZ area).

<u>EFH Description for Chum Salmon</u>

Freshwater Eggs
No EFH description determined (all outside of EEZ area).

Freshwater Larvae and Juveniles
No EFH description determined (all outside of EEZ area).

Estuarine Juveniles
No EFH description determined (all outside of EEZ area).

Marine Juveniles
Marine EFH for juvenile chum salmon is the general distribution area for this life stage, located in all marine waters off the coast of Alaska (more than 3 nm) to depths of 50 m extending to the 200-nm limit of the U.S. EEZ, including the GOA, EBS, Chukchi Sea, and Arctic Ocean, as depicted in Figure D-361.

Marine Immature and Maturing Adults
EFH for immature and maturing adult chum salmon is the general distribution area for this life stage, located in marine waters off the coast of Alaska (more than 3 nm) to depths of 200 m extending to the 200-nm limit of the U.S. EEZ, including the GOA, EBS, Chukchi Sea, and Arctic Ocean, as depicted in Figure D-361.

Freshwater Adults
No EFH description determined (all outside of EEZ area).

EFH Description for Sockeye Salmon

Freshwater Eggs
No EFH description determined (all outside of EEZ area).

Freshwater Larvae and Juveniles
No EFH description determined (all outside of EEZ area).

Estuarine Juveniles
No EFH description determined (all outside of EEZ area).

Marine Juveniles
Marine EFH for juvenile sockeye salmon is the general distribution area for this life stage, located in all marine waters off the coast of Alaska (more than 3 nm) to depths of 50 m extending to the 200-nm limit of the U.S. EEZ, including the GOA, EBS, Chukchi Sea, and Arctic Ocean from mid-summer until December of their first year at sea, as depicted in Figure D-362.

Marine Immature and Maturing Adults
EFH for immature and maturing adult sockeye salmon is the general distribution area for this life stage, located in marine waters off the coast (more than 3 nm) of Alaska extending to the 200 nm limit of the U.S. EEZ, including the GOA, EBS, Chukchi Sea, and Arctic Ocean, as depicted in Figure D-362.

Freshwater Adults
No EFH description determined (all outside of EEZ area).

EFH Description for Chinook Salmon

Freshwater Eggs—No EFH Description Determined
All are outside of the EEZ area.

Freshwater Larvae and Juveniles—No EFH Description Determined
All are outside of the EEZ area.

Estuarine Juveniles—No EFH Description Determined
All are outside of the EEZ area.

Marine Juveniles
Marine EFH for juvenile Chinook salmon is the general distribution area for this life stage, located in all marine waters off the coast of Alaska (more than 3 nm) extending to the 200-nm limit of the U.S. EEZ, including the GOA, EBS, Chukchi Sea, and Arctic Ocean. Juvenile marine Chinook salmon are at this life stage from April until annulus formation in January or February during their first winter at sea, as depicted in Figure D-363.

Marine Immature and Maturing Adults
EFH for immature and maturing adult Chinook salmon is the general distribution area for this life stage, located in marine waters off the coast of Alaska (more than 3 nm) extending to the 200-nm limit of the U.S. EEZ, including the GOA, EBS, Chukchi Sea, and Arctic Ocean, as depicted in Figure D-363.

Freshwater Adults—No EFH Description Determined
All are outside of the EEZ area.

EFH Description for Coho Salmon

Freshwater Eggs
No EFH description determined (all outside of EEZ area).

Freshwater Larvae and Juveniles
No EFH description determined (all outside of EEZ area).

Estuarine Juveniles
No EFH description determined (all outside of EEZ area).

Marine Juveniles
Marine EFH for juvenile coho salmon is the general distribution area for this life stage, located in all marine waters off the coast of Alaska (more than 3 nm) extending to the 200-nm limit of the U.S. EEZ, including the GOA, EBS, Chukchi Sea, and Arctic Ocean, as depicted in Figure D-364.

Marine Immature and Maturing Adults
EFH for immature and maturing adult coho salmon is the general distribution area for this life stage, located in marine waters off the coast of Alaska (more than 3 nm) extending to the 200-nm limit of the U.S. EEZ, including the GOA, EBS, Chukchi Sea, and Arctic Ocean, as depicted in Figure D-364.

Freshwater Adults
No EFH description determined (all outside of EEZ area).

D.6.5.3 EFH Map Descriptions for Alaska Stocks of Pacific Salmon

Figures D-360 through D-364 show EFH distribution under Alternative 6 for the Alaska stocks of Pacific salmon as described above.

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