Bering Sea Habitat Conservation

Prepared by NPFMC staff

Background

In February 2005 the North Pacific Fishery Management Council (NPFMC) took action to conserve essential fish habitat (EFH) from potential adverse effects of fishing. EFH is defined as those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity. The EFH EIS concluded that fisheries do have long term effects on habitat; however these impacts were considered minimal and the analysis found no indication of detrimental effects on fish populations. Nevertheless, the Council adopted several new measures to minimize the effects of fishing on EFH in the Aleutian Islands (AI) and Gulf of Alaska. A full description of the actions taken under Essential Fish Habitat is provided in the EFH EIS. These regulations will be promulgated by August 2006.

The EIS also evaluated a suite of alternatives for the eastern Bering Sea (EBS). However, based on that analysis, the Council determined that additional habitat protection measures in the EBS were not needed, and that an expanded analysis of potential mitigations measures for the EBS should be conducted prior to taking action.

The Council suggested that initial alternatives for this analysis include components of the preferred EFH EIS Alternative 5B for the Bering Sea region. The full Council motion on EFH from February 2005 is included as Attachment 1. A description of the Alternative 5B as analyzed in the EIS is attached as Attachment 2.

In December 2005, the Council discussed these alternatives and finalized a problem statement (Attachment 3). The Council removed the concept of rotational closures from the upcoming analysis, based on SSC concerns. The SSC noted that rotational closures could have unintended consequences. Unintended consequences could include: (1) insufficient time between openings for recovery to occur; (2) areas not previously of interest to the fishery become fished because of a required rotation, thereby affecting previously unaffected areas; and (3) displacing the fishery to areas with a lower CPUE, thus requiring more bottom contact for the same number of fish to be caught.

The purpose of this discussion paper is to provide background information to assist the Council with formulating a reasonable range of alternatives to minimize (to the extent practicable) the effects of fishing on EFH in the Bering Sea.

Review of Effects of Fishing on EFH in the Bering Sea

An evaluation of the potential adverse effects of all regulated fishing activities on EFH was analyzed in the EIS. The evaluation (1) described each fishing activity, (2) reviewed and discussed all available relevant information, and (3) provided conclusions regarding where and how each fishing activity adversely affects EFH. A full description of this analysis can be found in Appendix B of the EFH EIS, and a review of habitat features and current literature was addressed in Chapters 2 & 3.2.3. A brief description of habitat types is attached as Appendix 1.

The effects of fishing analysis contained within the EFH EIS combined available information on (1) intensity of fishing effort; (2) sensitivity of habitat features to contact with fishing gear; (3) recovery rates of habitat features, and (4) distribution of fishing effort relative to different types of habitat into a long-term effects index (LEI). The LEI estimated the percentage by which these habitat features would be reduced from a hypothetical pristine condition if recent intensity and distribution of fishing effort were

continued over a long enough term to achieve equilibrium. Equilibrium is defined as a point where the rate of loss of habitat features from fishing effects equal the gain from feature recovery. The spatial pattern of long-term effect indices largely reflects the distribution of fishing effort scaled by the sensitivity and recovery rates assigned to different features in different habitat types. Patterns of LEI for each feature class were similar with higher overall LEIs for more sensitive or slower recovering features (see attached Tables B-2.9 and B-2.10, taken from the EFH EIS).

For the Bering Sea, the quantitative model showed the higher effects (the long-term equilibrium effect indices 'LEI values') on living structure in sand/mud and slope habitats, with about 11 percent of the living substrate habitat (if it was in fact available) affected by all fisheries combined (see Table B.2-9). The largest impacts were attributed to the pollock trawl and flatfish trawl fisheries. None of the Bering Sea managed fish species, or their prey, rely on the living structure found on sand/mud habitats, based on the best available scientific information. Thus, even though 11 percent of the habitat would potentially be affected, the effect of fishing on EFH was determined to be minimal. The LEI values for other habitat features and benthic substrates were very low (0 to 4 percent of the habitat potentially affected) (see Table B.2-9).

Discussion of Potential Alternatives

Open Area Approach

The premise of the open area approach is that 'the first pass of a trawl is the worst pass'; i.e. that trawling over undisturbed bottom causes more damage than any subsequent trawl passes. Thus, constraining trawling to areas that have already been impacted has conservation benefits. Allowing trawling in previously untrawled areas could potentially result in acute local changes to the benthos and overall a increase in the LEI.

Limiting the trawl fishery to those areas traditionally fished provides a precautionary approach by setting aside relatively pristine areas before they become impacted. This habitat conservation measure mirrors the approach used for protecting terrestrial areas from development (e.g., national parks). The analysis (Chapter 4) discusses the significant benefits of prohibiting trawling in the northern Bering Sea areas, particularly to conserve snow crab habitat and habitats used by other species.

The creation of an open area that encompassed historically fished areas would not reduce the effects of fishing that generated the LEI scores. On the other hand, creation of closure areas in areas currently fished may redirect effort into potentially lower CPUE areas, which may cause more impacts on EFH.

An open area based on historic fishing patterns may not adequately represent the distribution of current bottom trawl fisheries, as effort appears to have expanded northward in response to fish distribution. This primarily is due to shifts in the ecosystem; a northward shift in response to changing temperatures, atmospheric forcing and compositional changes in the predominant groundfish biomass structure. Recent fishing effort depicts this northern shift in fishing effort in Figure 3. Note that the open area described and analyzed in the EFH EIS does not reflect recent effort in the northern areas (St. Matthew and south of Nunivak Island) or consider reporting area 519 (Bogoslof).

Gear Modifications

Gear modifications also may be a useful tool to mitigate effects of the BS trawl fisheries as a stand alone alternative or combined with other management approaches. These modifications may be based on the concepts presented in the EFH EIS, or on current research being developed as described below.

The AFSC's Conservation Engineering division and a group of many of the Bering Sea bottom-trawl catcher-processors have initiated a cooperative project to develop and test gear modifications. Craig Rose (AFSC–RACE division) delivered a preliminary report to the Council in December 2005, summarized by the following information.

At a meeting with captains of Bering Sea flatfish trawlers, in May 2005, bottom trawl gear configurations were identified and concepts for effective modifications were suggested. These included different groundgears (sweeps, bridles and footropes) that substantially reduce the amount of seafloor contact and/or increase the seafloor clearance below non-contact portions. It was recognized that large reductions in catch rates would be counter-productive, requiring longer towing distances to catch the same amount of fish, and would inhibit acceptance by industry. Evaluations of modification thus require assessment of both how they affect habitat features differently and any changes they cause in capture efficiency.

The 2005 field research tested the capture efficiency consequences of raising groundgear above the seafloor for most of its length. These preliminary results describe a test raising sweeps approximately three inches. Modifications were made to the sweeps by adding disks onto conventional sweeps (2-inch diameter combination wire), and raising the sections between the disks approximately 3-inches (8-inch disks) above the seafloor. Total sweeps lengths were 430 ft, not including tailchains to link them to the doors or 90-ft sections of bridles immediately ahead of the nets. The disks were installed on the aft half (215 ft) of the sweeps at 30-ft intervals. Modified sweeps were paired against sweeps without disks ahead of matched trawl on the two sides of the twin trawl system.

The footropes used in this experiment had relatively small spaces for escape underneath, while still being in the range of footropes used in Bering Sea flatfish fisheries. Both footropes had 14-inch cylindrical bobbins across the center of the footrope with approximately 5-inch spacing between bobbins. The side sections of the footropes were equipped with 12-inch spheres separated by 24 inches of 8-inch diameter cylinders.

Field work in fall of 2005 showed no consequential changes to catch rates of deepwater flatfish when disks were added on the trawl sweeps at 30-foot intervals. Preliminary review of acoustic images taken during the research this fall suggests that these modifications successfully raised most of the length of the sweeps off of the seafloor. This decreased contact is expected to reduce damage to the typical kinds of sessile invertebrates found on the Bering Sea shelf that provide structure on sand and mud seafloor habitats.

These preliminary results represent an initial step toward finding methods to reduce the seafloor effects of bottom trawls used in Bering Sea groundfish fisheries. The experiment indicated that catch rates would not be expected to decline if disks were used to raise sweeps off of the seafloor. The increase in catch of some species was unexpected and requires further study to clarify its causes. One important consideration is the very low light levels, which likely prevent visually-mediated herding. The disks and associated hardware may have changed the sounds generated by the sweeps and hence herding based on that sense. An important follow-up will be to perform similar tests in the shallower sections of the Bering Sea, where light levels are much higher and where the largest bottom trawl fisheries are pursued.

Video and acoustic tools are in development to further assess the effects of gear modifications. Additionally, this project will continue with developing modification to sweeps and footropes of trawl systems. Field work is planned for 2006. Tests will include catch experiments in shallower, sandy substrates and direct evaluations of how the modifications change how trawls affect the seafloor and its inhabitants.

The effect of fishing analysis within the EIS was also used to evaluate habitat mitigation provided by gear modifications. The reduction of damage to biological structure organisms by providing gear modifications were speculative in the analysis, and would require testing before implementation. However, a

preliminary run of the data was performed to see what effect a 50 percent reduction in mortality for organisms passing through the spaces of modified gear would have on biostructure reductions. The result was a 16 percent reduction in slope LEI and a 19 percent reduction in sand/mud LEI (including the rotational closures).

Others Measures

The study by the National Research Council entitled "Effects of trawling and dredging on seafloor habitat" (NRC, 2002) underscored the potential for rationalization of fishing effort to decrease effects of fishing on EFH. The concept is relatively simple: rationalization can reduce impacts on EFH if it effectively creates incentives to reduce excess fishing capital, if it allows fishing to occur in a more orderly and efficient manner, and specifically, if it creates incentives for fishing to occur in the available fishing areas where catch rates are the highest and gear loss is minimized. It stands to reason that this should reduce the overall number of hours of bottom contact for fisheries that contact the seafloor and therefore reduce potential habitat effects. This is especially true for fisheries where habitat effects are related to the quantity and intensity of fishing effort.

Rationalization of excess fishing capital has not been extensively explored as a means to reduce effects of fishing on EFH but a reduction in effort clearly reduces effects. Reduction of effort has occurred in Alaska fisheries via several rationalization programs: BS Crab Rationalization, American Fisheries Act (AFA), CDQ Program, and the halibut/sablefish IFQ program. The fast pace of the previous overcapitalized, high capacity fleet that significantly decreased under rationalization to longer seasons and a slower paced fishery should result in less fishing of marginal areas where habitat impacts might occur, a further reduction in gear loss, bycatch and a decrease in the disruption of community structure/behavior and other stock impacts.

Other approaches to habitat conservation for the EBS may be through the habitat areas of particular concern (HAPC) process. Previous HAPC proposals were considered for the EBS in the 2004 call for proposals; details of these are summarized in Appendix 2.

Summary

Fishery activities have been estimated to potentially reduce 0-11 percent of benthic habitats in the Bering Sea, depending on substrate feature. Highest impacts are estimated for living substrates on sand/mud bottoms and along the slope. Alternatives can be developed to mitigate these impacts.

The Council intends to consider practicable and precautionary management measures to reduce the potential adverse effects of fishing on EFH and to support the continued productivity of managed fish species. Towards that end, staff provides the following strawman for Council discussion on the analysis of Bering Sea Habitat conservation.

Alternative 1: Status quo

Alternative 2: Open area approach utilizing fishing data through 2005 to define area

Option 1: Include the areas north of Bogoslof and south of Nunivak Island in the open area.

Alternative 3: Require gear modifications on all bottom trawl gear to reduce seafloor contact and/or increase clearance between the gear and substrate.

Alternative 4: Open area approach utilizing fishing data through 2005 to define area, plus require gear modifications on all bottom trawl gear to reduce seafloor contact and/or increase clearance between the gear and substrate.

Option 1: Include the areas north of Bogoslof and south of Nunivak Island in the open area.

References

National Research Council, (NRC). 2002. Effects of trawling and dredging on seafloor habitat. National Academy Press, Washington, D.C.

NOAA Fisheries. 2005. Draft Environmental Impact Statement for Essential Fish Habitat Identification and Conservation in Alaska. U.S. Department of Commerce, National Oceanographic and Atmospheric Administration, National Marine Fisheries Service, Alaska Regional Office, P.O. Box 21668, Juneau, AK 99802, April 2005. Volumes I-II 2,500 pp.

Table B-2.9 Long-term Effect Indices (LEI* in % reduction) for Fishing Effects on Benthic Habitat Features of the Bering Sea by Habitat Type (low and high LEIs in parenthesis) (NOAA Fisheries, 2005).

Soft Substrates (mud-gravel)

Habitat	Bering Sea			
Features	**Sand**	**Sand/Mud**	**Mud**	**Slope**
Infauna Prey	0 (0-1)	2 (0-4)	0 (0-0)	3 (1-7)
Epifauna Prey	0 (0-1)	2 (0-3)	0 (0-0)	3 (0-6)
Living Structure	4 (1-6)	11 (3-19)	0 (0-1)	11 (4-19)
Non-living Structure	0 (0-1)	1 (0-3)	0 (0-0)	4 (1-7)
Hard Coral	N/A	N/A	N/A	N/A

* LEI Estimated eventual reduction in a class of habitat feature if recent fishing intensity and distribution were continued until fishing effect rates and habitat recovery rates equalized (equilibrium).

Table B.2-10 Long-term Effect Indices (LEI*). Indicating the Effects of Fishing on Habitat Features by Fishery for the Features with the Highest LEIs in the Bering Sea (NOAA Fisheries, 2005)

Bering Sea (soft substrate)	**Sand/Mud Biostructure**	**Slope Biostructure**
Pollock Pelagic Trawl	4.6%	7.2%
Yellowfin Sole Trawl[1]	2.9%	0.2%
Flathead Sole/Flatfish Trawl[1]	1.8%	1.6%
Rock Sole Trawl[1]	0.9%	0.2%
Pollock Bottom Trawl[1]	0.4%	0.6%
Pacific Cod Trawl[1]	0.2%	0.4%
Sablefish/Turbot Trawl[1]	0.1%	0.7%
Pacific Cod Longline	0.0%	0.0%
Rockfish Trawl[1]	0.0%	0.0%
Pot	0.0%	0.0%
Sablefish/Turbot Longline	0.0%	0.0%
Total	**10.9%**	**10.9%**
[1] Total Bottom Trawl	6.3%	3.7%

* LEI Estimated eventual reduction in a class of habitat feature if recent fishing intensity and distribution were continued until fishing effect rates and habitat recovery rates equalized (equilibrium).

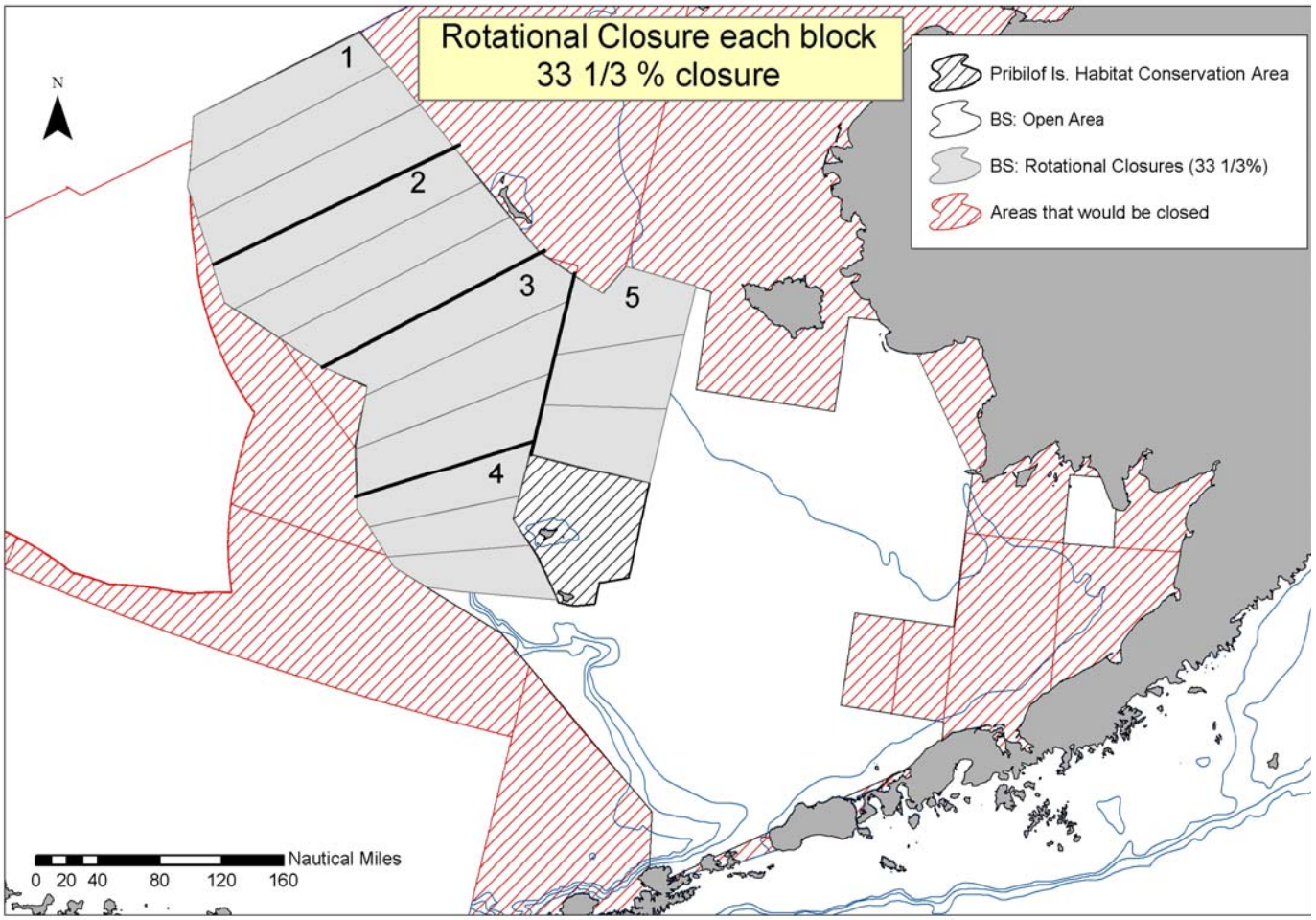


Figure 1. Alternative 5 B analyzed in the EFH EIS with rotational closures.

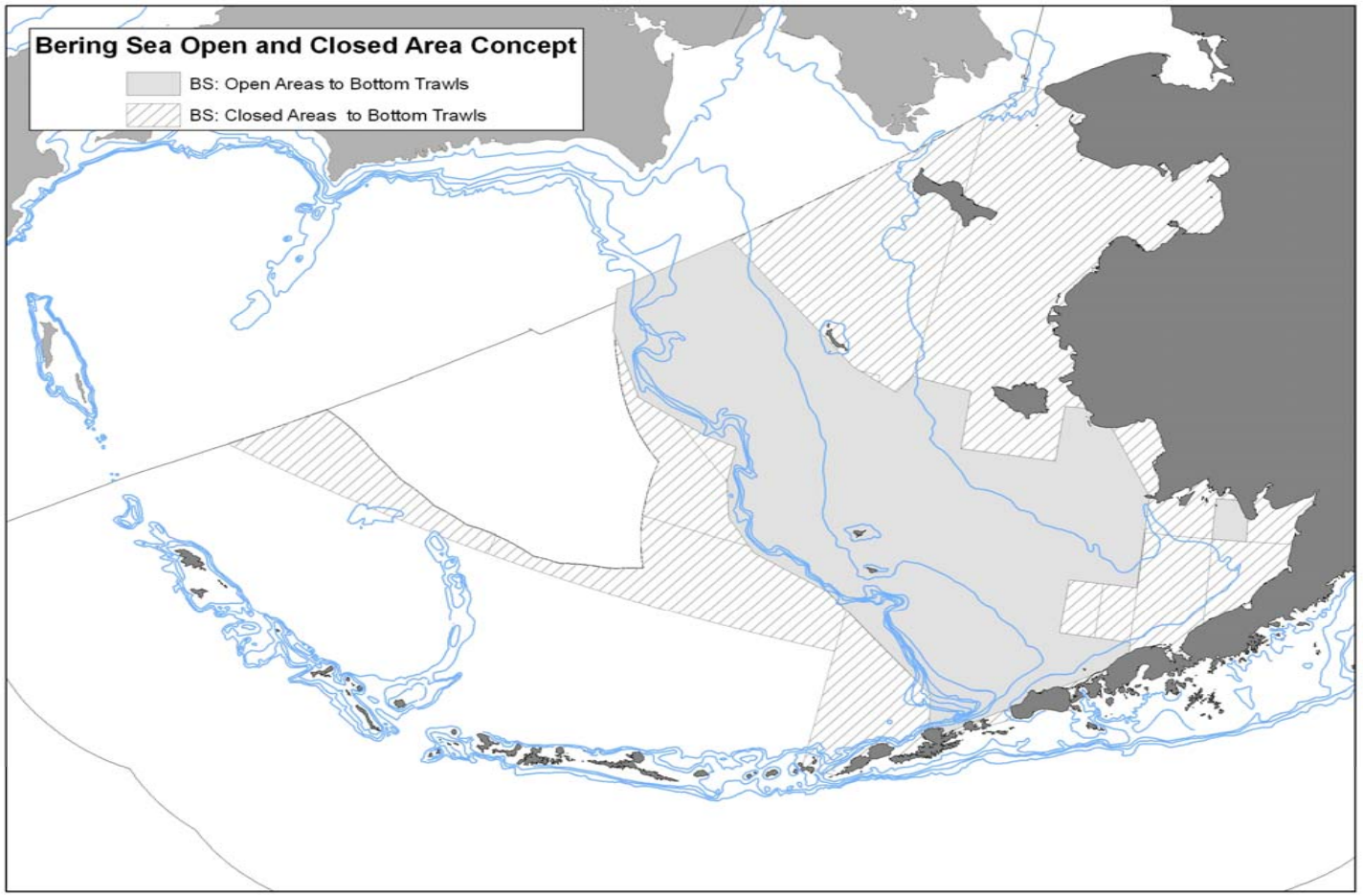


Figure 2. Open area approach without rotations, with fishing effort through 2002.

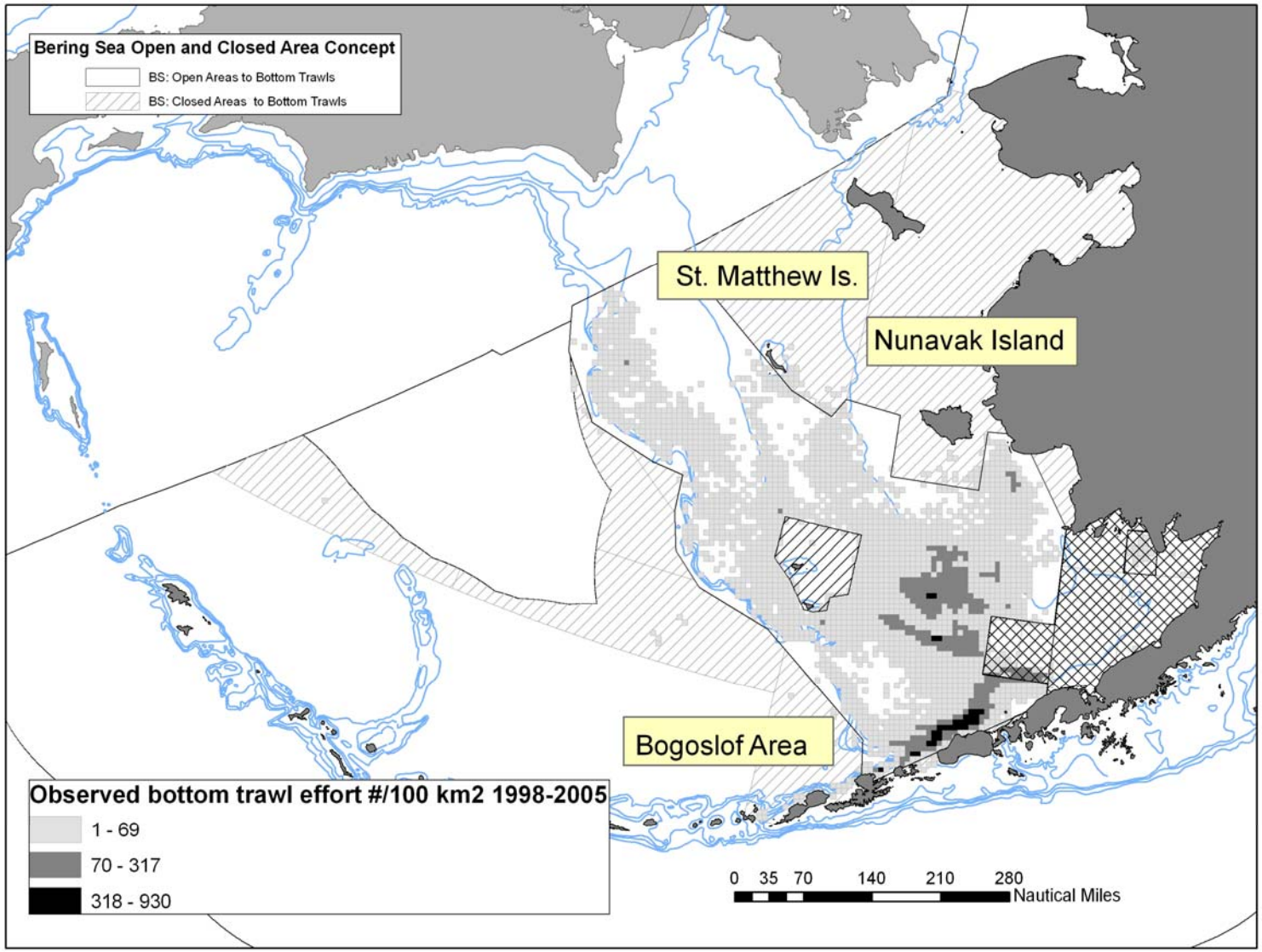


Figure 3. Open area approach with recent fishing effort 1998 thru 2005 displayed, to focus on areas fished since the EFH EIS.

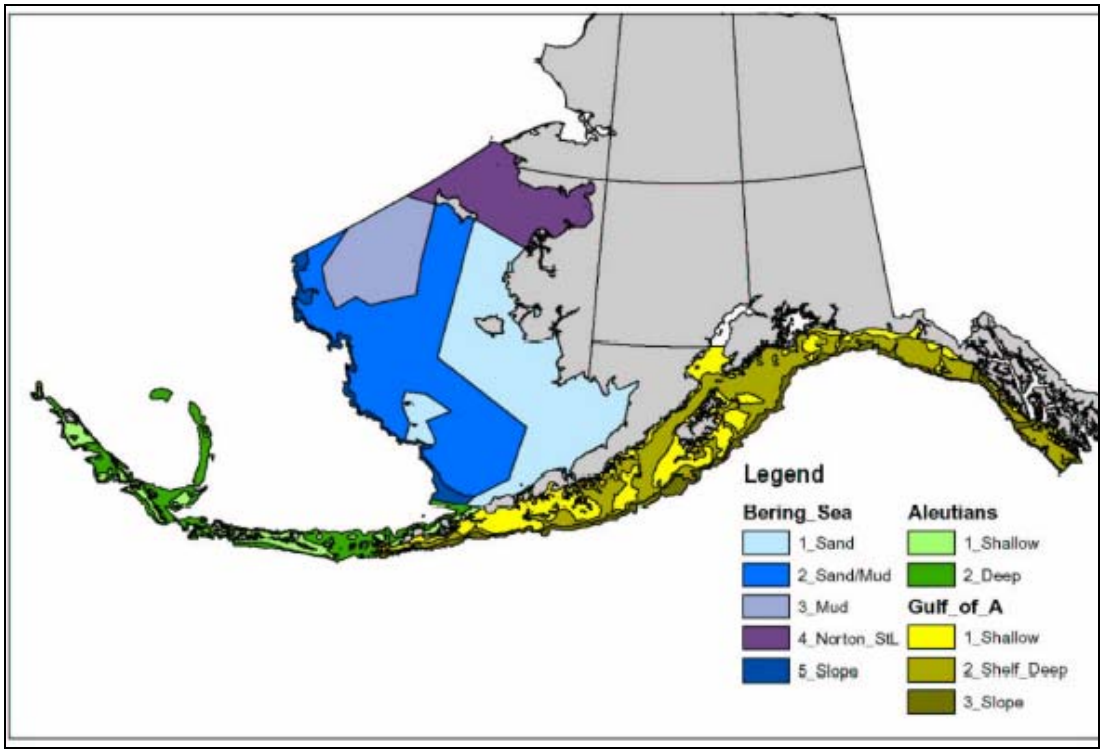


Figure 4. Surficial Sediment Textural Characteristics According to Naidu (1988)
Note: This is for portion of the Continental Shelf that is the focus of the EBSSED Database.

Appendix 1: Benthic Substrates in the Aleutian Islands and Bering Sea.

The Bering Sea has a total area of 2.3 million km^2 (684,523 nm^2), 44 percent is continental shelf, 13 percent is continental slope, and 43 percent is deep water shelf. The broad continental shelf is one of the most biologically productive areas of the world. The EBS contains approximately 300 species of fish, 150 species of crustaceans and mollusks, 50 species of seabirds, and 26 species of marine mammals (Livingston and Tjelmeland, 2000). Many of the fish and invertebrates species are considered under EFH designations.

The distribution of benthic sediment types in the EBS shelf is related to depth. Local variability is indicated in areas along the shore of Bristol Bay and the north cost of the Alaska Peninsula, as well as west and north of Bristol Bay, especially near the Pribilof Islands. There is a general pattern of nearshore sediments in the east and southeast on the inner shelf (0 to 50m depth) are often sandy gravel and gravelly sand. Further offshore and west these give way to plain sand. On the middle shelf (50 to 100m), sand gives way to muddy sand and sandy mud, with continues over much or the outer shelf (100 to 200m) to the start of the continental slope (Figure 4).

McConnaughey and Smith (2000) and Smith and McConnaughey (1999) describe the available sediment data for the EBS shelf. These data were used to describe four habitat types. The first, situated around the shallow eastern and southern perimeter and near the Pribilof Islands, has primarily sand substrates with a little gravel, the second, across the central shelf out to the 100m contour, has mixtures of sand and mud. A third, west of a line between St. Matthew and St. Lawrence islands, has primarily mud (silt) substrates with some mixing with sand. Finally, the areas north and east of St. Lawrence Island, including Norton Sound, have a complex mixture of substrates (Figure 2).

Fisheries that occur in the sand habitat include: Pacific cod trawl, rocksole trawl, pollock pelagic trawl, and yellow fin sole trawl. Fisheries affecting live structure on slope habitat areas in the BS include sablefish Greenland turbot trawl, flathead sole and other flatfish trawl and pelagic trawl. Fisheries affecting living structure on the sand/mud habitats include rock sole trawl, pollock pelagic trawl, flathead sole and other flatfish trawl, and yellow fin sole trawl.

Two large canyons are present along the continental shelf edge. Zhemchug Canyon and Pribilof Canyon are considered some of the nation's deepest underwater canyons. Pribilof Canyon is approximately 1800 meters deep and 30 miles wide and starts less than 20 miles north of St. George Island. Zhemchug Canyon is approximately 2700 meters in depth and spans over 60 miles wide, is 100 miles east of St. Paul Island

In contrast the Aleutian Island shelf is very narrow. The Aleutian Island region is an extensive archipelago composed of approximately 150 islands of volcanic origin and extending about 2,260 km in length. The continental shelf is narrow and is crossed by numerous deep passes. The Aleutian Island region lies in an arc that forms a partial land barrier to the exchange of northern Pacific marine waters to the Eastern Bering Sea waters. The AI continental shelf is narrow, ranging in width on the north and south sides of the islands from about 4 km to 46 km; the shelf broadens in the eastern portion of the AI arc. Very strong currents flow through the passes and across the shelf with the dominant direction from the North Pacific to the Bering Sea (Zenger, 2002).

The AI region has a complex mix of substrates, including a significant proportion of hard substrates (pebbles, cobbles, boulders, and rock), but data are not available to describe spatial distribution of these substrates (NOAA Fisheries, 2005). The rough, rocky bottom conditions provide abundant substrate for many species of bryozoans, hydroids, sponges and corals (Zenger, 2002). Living structures on the Aleutian shelf are fixed to hard substrates. They could be characterized by having high profiles, rigid structures and are ultra slow to recover. Fish populations and fishing distributions are sharply constrained by substrate and complex terrain and bathymetry.

Appendix 2: Habitat Areas of Particular Concern (HAPC) previous 2004 proposals for the Bering Sea.

1. Zhemchug Canyon and Pinnacles and Pribilof Canyon are located in the Bering Sea. The immense deepwater canyons and pinnacles are part of the Bering Sea continental shelf edge which is known to be areas of high biodiversity and productivity. The concentration of primary and secondary producers in this region attracts large numbers of fish, squid, marine mammals and birds. These canyons and pinnacles are possible sources of dispersal and export for surrounding systems and require protection as HAPC for the benefit of future research, fisheries health, and the conservation of several sensitive species including long-lived and slow-reproducing fish such as rougheye and shortraker rockfish, rare marine mammals such as the harbor seal, and rare seabirds such as the short-tailed albatross.

2. Areas of Soft corals- Dense aggregations of Gersemia.
The EBS has aggregations of Gersemia sp., also known as sea raspberries. This species are examples of a myriad of sea vegetables that may provide essential habitat for many EFH species including rockfish, Pacific Ocean perch, walleye pollock, flatfish, Atka mackerel, golden king crab, shrimp, Pacific cod, pollock, : yellowfin sole, arrowtooth flounder flathead sole, rex sole, greenling, Greenland turbot, and sablefish. These species are short lived and soft in structure.

The HAPC proposal process occurs on a three year cycle when the Council may wish to set priorities and call for proposals. Future focuses for HAPC designation may stem from current research efforts. HAPC designation does not require any management measures attached.

Attachment 1: Council motion on EFH from February, 2005

EFH Final Action NPFMC February 10, 2005
Council Motion
(M/S Krygier/Rasmuson 1:20 pm)
Passed Unanimously at 2:45 pm

Action 1: Describe and Identify EFH

Adopt Alternative 3—Revised General Distribution (The Council's Preliminary Preferred Alternative) as described on page ES-2 of the Preliminary Final EFH EIS – January 2005.

Action 2: Adopt an Approach for Identifying HAPCs

Adopt Alternative 3—Site based Concept (The Council's Preliminary Preferred Alternative) as described on pages ES-4.

Action 3: Minimize Adverse Effects of Fishing on EFH.

Adopt a Modified 5B to expand Bottom Trawl Closures in the GOA and Aleutian Islands Management Areas to protect Sponge, Coral and other important habitat for managed species.

Bering Sea: Initiate an expanded analysis for the Bering Sea, **as well as an assessment of gear modifications** that tiers off of this EFH EIS analysis to further explore possible mitigation measures in the Bering Sea. The analysis should include the existing alternative, an alternative to leave the rolling closure area open, and options to open the "red hatched" closed area south of Nunivak Island and north of the Bogoslof area**, with other alternatives to be developed.**

Aleutian Islands: Allow bottom trawling to continue in AI areas that have supported the highest catches in the past, and prohibits bottom trawling in all other portions of the AI management region to prevent future impacts to undisturbed habitats in those areas as described in a modified Option 3, as described in the attached Figure (modified ES-12) and including six Aleutian Islands Coral Gardens (as identified in Figure ES-11). The six coral gardens are closed to all bottom **contact** ~~tending~~ gear. Pelagic trawls could be used outside of the designated open areas, but only in an off-bottom mode. The existing observer program will be utilized, and a vessel monitoring system (VMS) for **all fishing vessels is** ~~fishing groundfish is~~ required. A comprehensive plan for research and monitoring will be developed. Option 3 opens designated areas based on areas of higher effort distribution from 1990 through 2001 as modified through input from trawl fisherman and public testimony.

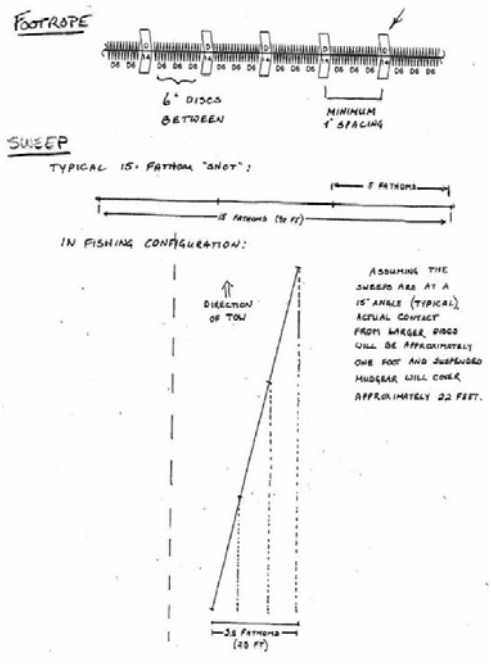
Gulf of Alaska: Prohibit the use of bottom trawl for all groundfish in 10 designated areas (Figure ES-7 in the Executive Summary of the January 2005 Preliminary Final EFH EIS). At the time of the Council's five year review period, the Council will review available research information regarding the two GOA closed areas (one west [area 610] and one east [area 620] of Sanak HAPC closure to determine the efficacy of continued closure.

The Council will review these actions in five years to consider new information from on-going and future research.

Attachment 2: Summary of EFH EIS Alternative 5B for the Bering Sea

Bottom Trawl Closures: This alternative would prohibit the use of bottom trawl gear for all groundfish fisheries in the EBS except within a designated **open area**. The open area would be designated based on historic bottom trawl effort, and no areas currently closed would be open. Within the open area, there would be **a rotating closure** to bottom trawl gear in five areas to the west, north, and northwest of the Pribilof Islands. Closure areas would be designated in Blocks 1,2,3,4, and 5, and with 5-year closed periods for 33.3 percent of each block. After 5 years, the closed areas would reopen, and the next 33.3 percent area of each block would close for 5 years, and so on, thereafter. After 15 years, all areas within each block would have been subject to a 5-year closure, and the rotating closure areas would start over (Figure 1). Additionally, bottom trawl gear used in the remaining areas open to trawling in the EBS would be required to have disks/bobbins on trawl sweeps and footropes described below.

Gear modification: In addition, bottom trawl gear used in the remaining open areas of the EBS would be required to have sweeps and footropes equipped with disks/bobbins to reduce contact area and proximity to the seafloor. The sweeps and footrope form a complete loop between the trawl doors. The footrope deploys immediately ahead of the bottom edge of the trawl net, and the sweeps connect each end of the footrope to a trawl door. The goal of the requirement would be to have configurations creating at least a 3-inch clearance below more than 90 percent of the length of any 35-foot section of sweep and at least a 3.5-inch clearance below more than 75 percent of the length of any 10-foot section of the footrope. In consultation with trawl captains, fisheries enforcement, and gear manufacturers, a measurement method would be developed to allow any 35-foot length of sweep and any 10-foot length of footrope to be evaluated to determine whether they meet these standards. A configuration that would meet sweep requirements would include discs or bobbins with a 9-inch minimum diameter separated by sections of disc spacers with a 3-inch maximum diameter, totaling at least nine times more lengths than the summed length of the large disks or bobbins. A configuration that would meet footrope requirements would include discs or bobbins with a 13-inch minimum diameter separated by sections of disc spacers with a 6-inch maximum diameter totaling at least three times more length than the summed length of the large disks or bobbins. The 9- and 13-inch-diameter disc sizes would have to be slightly smaller than what is commercially available (10 and 14 inches) to allow for wear and variations in production. The measurement technique would have to account for reductions in gear height due to bending or distortion of the large-diameter elements or large or off-center attachment holes. Metal weights attached to the sweeps or in-line chain cores in the sweeps would be restricted to within 18 inches of the large disks or bobbins. Two exceptions to the rules would be made: (1) the 100 feet closest to the doors would be unrestricted, and (2) the 50 feet of sweep closest to the end of the fishing line would be allowed to follow the footrope rule instead of the sweep rule. A diagram showing the configuration of trawl gear included in Alternatives 4 and 5B is provided to the right.



Attachment 3: Council motion on Bering Sea Habitat Conservation from December, 2005

Bering Sea Habitat Conservation
Council Motion December 12, 2005
Earl Krygier. 4:30pm
Passed Unanimously

Motion to Revise Problem Statement
December 2005

The Council intends to evaluate potential new fishery management measures to protect Essential Fish Habitat (EFH) in the Bering Sea. The analysis will tier off of the 2005 EFH Environmental Impact Statement and will consider ~~a range of alternative measures such as~~ **as alternatives** ~~-~~open and closed areas and gear modifications. The purpose of the analysis is to consider practicable and precautionary management measures to reduce the potential adverse effects of fishing on EFH and to support the continued productivity of managed fish species.

The Council requests that staff develop a suite of alternatives for review. Bering Sea alternatives 4 and %A from the previous EIS should be retained with the following modifications:

1. Exclude the rotations in the area-based measures
2. Analyze the alternative on gear modification, with consideration of recent work by Dr. Rose
3. Incorporate locations of recent bottom trawl effort in the development of the open areas-alternative.

Further, the Council directs staff to develop a discussion paper to evaluate the need for possible protection measures for St. Matthew blue king crab and Eastern Bering Sea snow crab. Elements of the paper would address the distribution of St. Matthew blue king crab and snow crab in the Eastern Bering Sea, including any information of the location of egg-bearing females, post-larval distribution and historical trawl effort in those areas.