

**Draft Minutes of the Ecosystem Committee Meeting
February 6, 2000**

The North Pacific Fishery Management Council's Ecosystem Committee met on February 6 in Anchorage to review the Habitat Areas of Particular Concern Analysis. Committee members Dave Fluharty, Linda Behnken, Chris Blackburn, and Dorothy Childers were present, along with approximately 15 others who attended. The meeting opened with cake and ice cream, celebrating Chris Blackburn's birthday. Recent ecosystem literature was distributed to attendees.

Committee chairman Dave Fluharty called the meeting to order at approximately 1 pm. Following introductions, Dave noted some items of interest to the group. The American Fisheries Society is developing a statement on marine stocks at risk (available for review at www.fisheries.org). In California, a Marine Life Conservation Act was recently passed by the legislature, establishing a system of marine reserves along the coast. There is also a national bill that has been drafted, calling for no-trawl zones in specific areas of the US.

The committee reviewed the analysis of habitat areas of particular concern (HAPC), which is part of the essential fish habitat requirements. HAPC are those areas of special importance that may require additional protection from adverse effects. HAPC is defined on the basis of its ecological importance, sensitivity, exposure, and rarity of the habitat. HAPCs already identified by the Council in its plan amendments last year include living substrates (e.g. eelgrass, kelp, sponges, coral) and freshwater areas used by anadromous fish. The analysis examined proposed HAPC habitat types including seamounts and pinnacles, the ice edge, the shelf break, and biologically-consolidated fine-grained sediments. Also examined were proposed specific HAPC areas including a deep basin in Prince William Sound, the Chrikov Basin north of St. Lawrence Island, and the red king crab bycatch areas around Kodiak Island. The proposed management alternatives included defining HAPC as a special or prohibited species and prohibiting fishing in areas of gorgonian coral abundance.

The committee recommended that the Council approve the following problem statement for HAPC protection measures.

Problem Statement: Scientific research shows that alteration of seafloor habitat changes the diversity and relative abundance of species, creates environments for opportunistic species, and may reduce the resilience of original species. It is the Council's responsibility to consider fishery impacts relative to natural impacts and to determine the supportable or sustainable threshold for fishery impacts. Management for habitat complexity and diversity is a precautionary approach that takes into account our limited knowledge of marine ecology and the effects of fishing practices. The primary objective for HAPC conservation is to establish a seafloor habitat conservation regime to ensure natural habitat complexity and biological diversity important for productive fisheries, a healthy marine ecosystem, and stable, flexible fishing economies.

The NPFMC has established time/area closures in the Gulf of Alaska and Bering Sea/Aleutian Islands for bycatch and habitat protection. However, a deliberate effort is needed to ensure that the range of HAPC types in each FMP are adequately addressed in a conservation regime.

Habitat protection does not require a prohibition on all fishing but rather a prohibition or modification of fishing practices that are most likely to harm essential habitats. To develop management plans that protect the full range of sensitive habitat types will be a phased process involving proposals, analyses, and public participation.

The committee recommends that the HAPC analysis be split into two parts. Part one would include the identification of additional HAPC types and areas, and management measures to control the take of selected HAPC species (HAPC as a PSC or new category). Part two would include any other measures proposed to protect coral or other HAPC type from fishing impacts. Part one could be scheduled for final action in April; part two would require more time and development.

The rationale for splitting out coral protection measures is that committee members generally felt that more stakeholder involvement was necessary and desirable. **The committee recommended that local people should be contacted for their input on habitat protection in their area.** The committee suggested that ADF&G advisory groups could meet this spring to provide local input on how and where to protect habitat. The Alaska Marine Conservation Council agreed to spearhead this effort. Dick Jacobson volunteered the Aleutians East Burrough to get local input from the western Gulf and AI areas.

The committee also had some recommendations to improve the HAPC analysis. First, the analysis should attempt to evaluate existing habitat protection measures by habitat type. In other words, what percentage of each habitat type is protected (note that this assumes we know the extent of HAPC distribution)? Second, the committee recommended that a definition of pinnacles be developed. Third, the committee expressed an interest in finding areas where a majority of HAPC species occur together in relatively high abundance. Another suggestion was to examine fishery effort distribution and find out how much area serves as defacto reserves because no fishing occurs there. Additionally, Section 1.5 describing what the Council has already done to protect habitat (pages 18-25) should be provided as background information earlier in the document. Then the document could focus on further actions; e.g., under an iterative process per the EFH rules and with direct user consultative process on where and how to protect habitat. Lastly, regarding reporting requirements for HAPC, it was generally felt that observer data would provide better information than mandatory reporting by fishermen. Identification of corals, spones, and other HAPC invertebrates can be very difficult, even for trained biologists.

The meeting adjourned at approximately 5:30 pm.

Attendance List for February 2000 meeting:

Dave Fluharty (committee chair)	Cindy Hatmann	Jim McManus
Chris Blackburn (member)	Mike Payne	John Gaurvin
Dorothy Childers (member)	Matt Eagleton	Clem Tillion
Linda Behnken (member)	Nina Mollet	Alvin Osterback
Dave Witherell (staff)	David Wigglesworth	Dick Jacobsen
Cathy Coon (staff)	Francine Bennis	Dan Falvey
Paul MacGreger	Karen Wood DiBari	Seth Macinko

MEMORANDUM

TO: Council, SSC and AP Members

FROM: Clarence G. Pautzke *CGP*
Executive Director *for*

DATE: February 1, 2000

SUBJECT: Habitat Areas of Particular Concern

ESTIMATED TIME 3 HOURS

ACTION REQUIRED

Initial Review of Habitat Areas of Particular Concern analysis.

BACKGROUND

The Magnuson-Stevens Act requires that fishery management plans identify and describe essential fish habitat (EFH), recommend measures to conserve and enhance EFH, and minimize to the extent practicable, adverse impacts from fishing on EFH. In June 1998, the Council adopted amendments to fishery management plans that describe essential fish habitat for managed species, as phase one in the EFH process. EFH is defined on the basis of general distribution, and is described as those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity. Phase two in this process is to identify additional habitat areas of particular concern (HAPC) and establish conservation measures to protect HAPC.

Habitat areas of particular concern (HAPC) are those areas of special importance that may require additional protection from adverse effects. HAPC is defined on the basis of its ecological importance, sensitivity, exposure, and rarity of the habitat. Several habitat types have been already identified as HAPC as part of the essential fish habitat amendments. These HAPC's included:

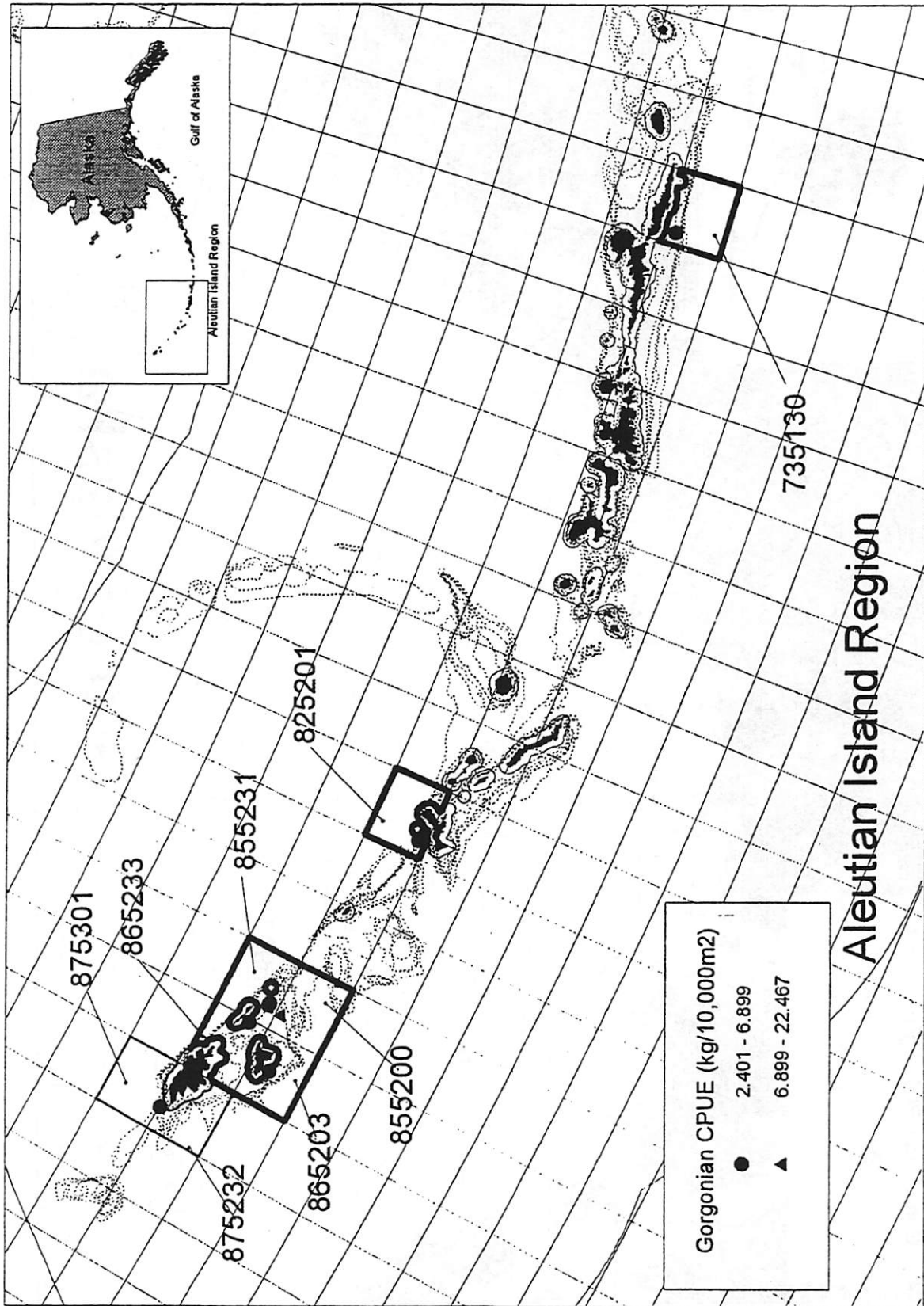
1. Living substrates in shallow waters (e.g., eelgrass, kelp, rockweed, mussel beds, etc.)
2. Living substrates in deep waters (e.g., sponges, coral, anemones, etc)
3. Freshwater areas used by anadromous fish (e.g., migration, spawning, and rearing areas)

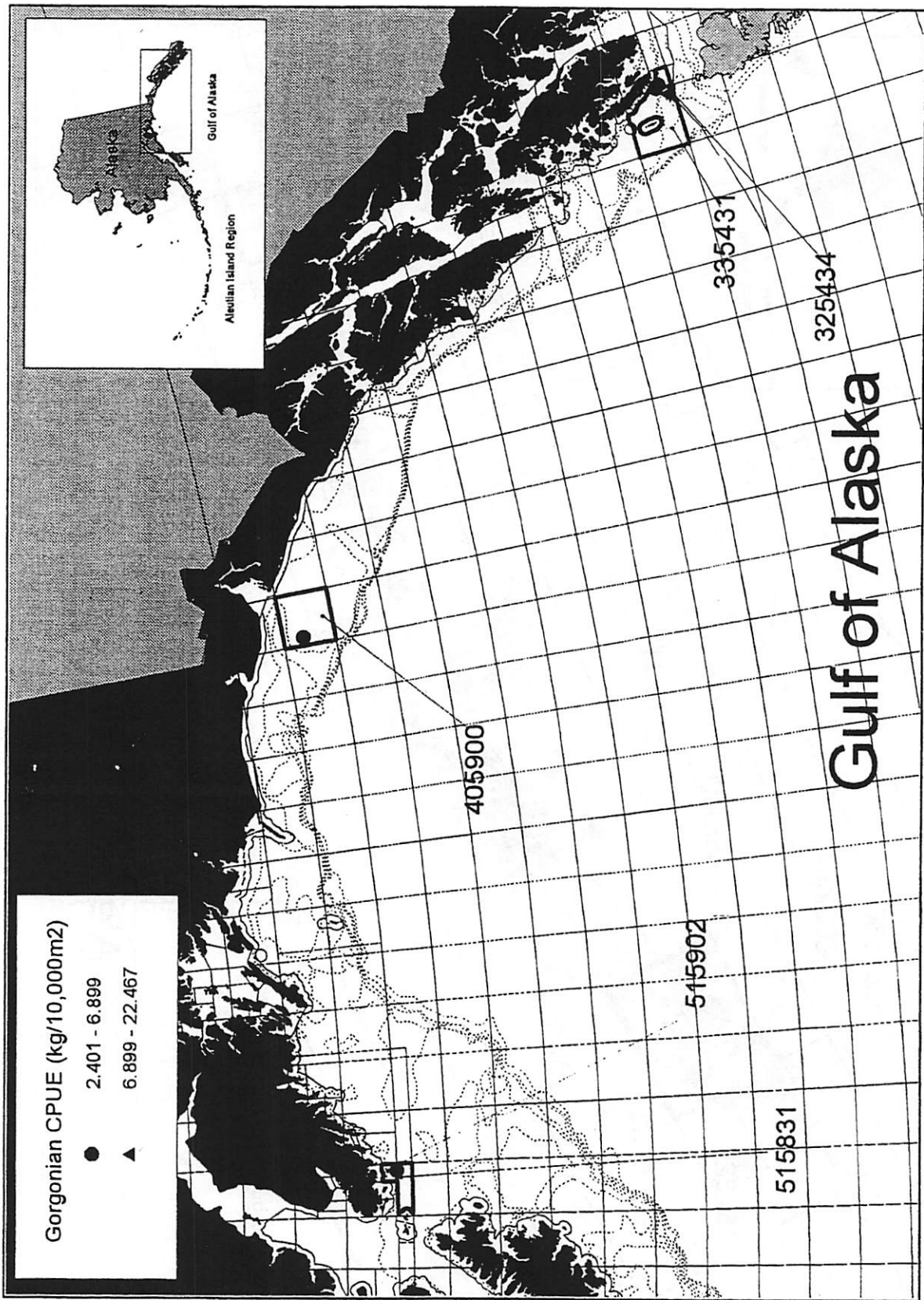
In October 1998, the Council approved for analysis several proposals regarding habitat areas of particular concern (HAPC). These proposals requested that a gap analysis be prepared, and additional habitat types and areas be designated as HAPC. Proposed HAPC habitat types included seamounts and pinnacles, the ice edge, the shelf break, and biologically-consolidated fine-grained sediments. Proposed specific HAPC areas included a deep basin in Prince William Sound, the Chrikov Basin north of St. Lawrence Island, and the red king crab bycatch areas around Kodiak Island.

At this meeting the Council will review the initial draft of an amendment that may identify additional HAPC, and proposes two management measures to protect HAPC from fishing effects. The first measure being considered would potentially prohibit directed fishing for certain HAPC biota (corals, sponges, kelp, rockweed, and mussels). The second measure would establish several marine protected areas where Gorgonian corals are found in abundance. Gorgonian corals have been shown to be important shelter for rockfish and other fish species, very long lived, easily damaged by fishing gear, and slow to recover from damage. The areas under consideration are shown in the attached figures (Item D-1(a)). The executive summary is attached as Item D-1(b).

At this meeting, the Council will make initial review of this amendment package; final action is scheduled for April 2000. Note that the Ecosystem Committee met on February 6 and will provide the Council with recommendations on the analysis.

On a related issue, NMFS has prepared a letter outlining their intent regarding implementation of the Sitka Pinnacles Marine Reserve (Item D-1(c)).





Executive Summary

This Environmental Assessment/Regulatory Impact Review (EA/RIR) addresses alternatives to protect and conserve essential fish habitat (EFH) of finfish, mollusks, and crustaceans. The Magnuson-Stevens Act mandates that any fishery management plan (FMP) must include a provision to minimize to the extent practicable adverse effects on such habitat caused by fishing, and identify other actions to encourage the conservation and enhancement of such habitat. The action identified in this EA/RIR is to define and identify additional habitat areas of particular concern (HAPC) in the North Pacific and implement management measures to minimize adverse impacts of fishing and non-fishing threats on HAPC to the extent practicable. These HAPC areas and management measures would be included in the five FMPs: the BSAI groundfish, GOA groundfish, BSAI crab, scallop, and salmon FMPs. The alternatives analyzed in the EA/RIR are highlighted in the following table.

Alternative 1: Status Quo. The FMPs would not be amended to add additional HAPC types and areas, and no additional measures would be taken to protect HAPC from potential effects caused by fishing and non-fishing activities.

Alternative 2: Amend the FMPs to include additional HAPC types and areas, and take additional measures to protect HAPC from potential effects caused by fishing and non-fishing activities.

A. Proposed HAPC habitat types

1. Seamounts and pinnacles
2. Ice edge
3. Shelf break or shelf edge domain
4. Biologically-consolidated fine-grained sediments

B. Proposed specific HAPC areas

1. A deep basin in Prince William Sound
2. The Chrikov Basin north of St. Lawrence Island
3. The red king crab bycatch areas around Kodiak Island

C. Options for Fishery Management Actions. *Note that both Option 2 and Option 3 can be adopted.*

Option 1. Status quo. No additional fishery management actions to protect HAPC from fishing impacts would be taken.

Option 2. Reclassify living substrate HAPC biota, which are currently either not covered by the FMP (i.e., BSAI coral), or are categorized in the groundfish plans as non-specified species (and hence have no catch limits or reporting requirements).

Suboption A: Classify selected HAPC biota as a prohibited species. This would specifically prohibit retention of all corals, sponges, kelp, rockweed, and mussels, all of which have commercial potential. Reporting requirements for this HAPC biota may be similar to other prohibited species.

Suboption B: Classify HAPC biota as a new category. This would allow specific management measures to be implemented to protect HAPC biota, without necessarily prohibiting incidental harvest or retention as a target fishery. Reporting of HAPC biota caught incidentally in groundfish fisheries may be required.

Option 3. Establish marine protected areas in areas of Gorgonian coral abundance.

Suboption A: Prohibit fishing in these areas by all gear types.

Suboption B: Prohibit fishing in these areas by bottom fishing gears (trawl, longling, dredge, pot, dinglebar), but allow fishing with some gears (jig, troll).

The goal of these FMP amendments is to provide additional protection of EFH from potential adverse effects due to fishing and non-fishing related activities through the identification of HAPCs. The information on HAPC conservation recommendations provided by NMFS or the Councils should encourage avoidance of activities that may adversely affect fish habitat in these areas. Conservation recommendations may advise the use of environmentally sound engineering and management practices (e.g., seasonal and gear restrictions, specific dredging methods, and disposal options) for all fishing and non-fishing related activities. If implemented by the action agencies, EFH/HAPC conservation recommendations provided by a Council or NMFS will improve the conservation of important aquatic habitats and the associated ecosystem. All of the alternatives to the status quo would be expected to benefit fish populations and their habitats, provide for improved long-term productivity of the fisheries, and benefit the vulnerable marine ecosystems.

Some of the proposed HAPC habitat types and areas ranked higher than others relative to the criteria specified in the guidelines for essential fish habitat. Analysis indicated that seamounts and pinnacles should receive HAPC type designation. Additionally, the deep basin in Prince William Sound should be designated as a specific HAPC area. Designation of HAPC areas could also include the Nearshore Bristol Bay closure area, the Pribilof Island Habitat Conservation Area, and the Sitka Pinnacles Marine Reserve. These areas meet most, if not all, of the criteria specified for HAPC designation.

Proposed management measures would reduce adverse impacts of fishing on HAPC. The option to prohibit harvest of some HAPC species would constitute a preventative approach, in that it would prevent a commercial fishery for these HAPC species from developing. Large amounts of coral have been commercially harvested in the past for jewelry, but recent catch records show that none has been reported taken in recent years.

The option to prohibit fishing on areas of gorgonian coral abundance would protect this vulnerable HAPC from adverse impacts due to fishing. These corals have been shown to be 1) important shelter for rockfish and other fish species; 2) very long lived; 3) easily damaged by fishing gear; and 4) slow to recover from damage. Although the proposed closure areas are small, and generally not in areas of high groundfish or crab fishing effort, the fishing industry may incur some operational costs associated with this measure. Nevertheless, it is unlikely that the total catch of all species would be affected by this measure.

To prohibit all fishing in the proposed coral protection areas, the Alaska Board of Fisheries would need to pass complementary regulations for fisheries under their jurisdiction (e.g., lingcod, scallops, salmon, crab). For example, some fishing for golden king crabs currently occurs in the proposed closure areas in the Aleutian Islands. Under the BSAI king and Tanner crab FMP, closed areas are a category 2 measure, meaning that the regulation can be adopted by the Board after following criteria set forth in the FMP. Note that one of the criteria for closed waters is "the need to protect critical habitat for target or non-target species".

None of the alternatives are expected to have a significant impact on endangered, threatened, or candidate species, and none of the alternatives would affect takes of marine mammals. Actions taken to define or protect HAPC are not likely alter the total harvest amounts of groundfish, crab, scallops, or salmon.

None of the alternatives is expected to result in a "significant regulatory action" as defined in E.O. 12866. However, this analysis will be conducted if appropriate for each FMP amendment.

None of the alternatives are likely to significantly affect the quality of the human environment, and the preparation of an environmental impact statement for the proposed action is not required by Section 102(2)(C) of the National Environmental Policy Act or its implementing regulations.



UNITED STATES DEPARTMENT OF COMMERCE
 National Oceanic and Atmospheric Administration
 National Marine Fisheries Service
 P.O. Box 21668
 Juneau, Alaska 99802-1668

AGENDA D-1(c)
 FEBRUARY 2000

January 13, 2000

Clarence G. Pautzke
 Executive Director, North Pacific
 Fishery Management Council
 605 W. 4th Avenue, Suite 306
 Anchorage, Alaska 99501-2252

RECEIVED

JAN 19 2000

N.P.F.M.C

Dear Clarence:

We are in the process of preparing draft proposed rulemaking to implement Amendment 59 to the Fishery Management Plan for the Groundfish Fishery of the Gulf of Alaska (GOA Groundfish FMP). As passed by the Council in June of 1998, Amendment 59 would have closed a 3.1 square nautical mile area off Cape Edgecumbe to fishing for groundfish, halibut and scallops, while commercial and recreational salmon fishing could continue. All anchoring would be prohibited. In consultation with Council staff, the proposed closure area has been renamed the Sitka Pinnacles Marine Reserve.

Originally, the proposed Sitka Pinnacles closure was considered as part of the EFH amendments, which amended all five of the North Pacific fishery management plans. However, the Council split the closure off as a separate amendment package. In the process of developing the draft notice of proposed rulemaking, we have become aware of a jurisdictional problem with Amendment 59. Under the GOA Groundfish FMP, we cannot prohibit fishing for species other than groundfish, nor anchoring by vessels other than vessels fishing for groundfish. A mandatory Federal prohibition on scallop fishing would require a change to the Fishery Management Plan for Scallop Fisheries off Alaska (Scallop FMP), while a similar mandatory Federal prohibition on anchoring by salmon vessels would require an amendment to the FMP for the Salmon Fisheries in the EEZ off the Coast of Alaska (Salmon FMP). We can, however, prohibit halibut fishing through separate regulations implementing the Northern Pacific Halibut Act, without changing any Federal fishery management plan.

In the case of scallop fishing, the lack of a Scallop FMP amendment prohibiting fishing for scallops in the Sitka Pinnacles Marine Reserve would not affect the reserve in any real way, because it contains no known scallop beds. Furthermore, scallop fishing in Southeast Alaska (State Registration Area A) has not been allowed under State regulations since July 23, 1994, the effective date of 5 AAC 38.120, which repealed the fishing season



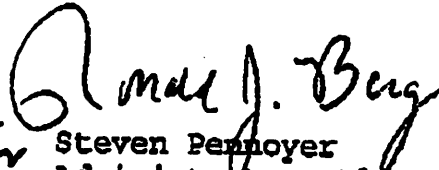
for scallops in Area A. If the Council wishes to request the State to further strengthen the closure, it could propose an agenda change to the State Board of Fish (BOF). According to BOF rules, this request would have to be submitted no later than 45 days before the first or last meeting of its cycle.

The inability to prohibit anchoring by salmon boats under Amendment 59 is more of a concern, because such anchoring was one of the problems identified as leading to potential degradation of the pinnacles habitat. NMFS is working with the State to implement this prohibition with additional State regulations. The State Board of Fish, at its February 14-25 meeting in Sitka, will take up a proposal to prohibit salmon fishing altogether in the proposed reserve, and anchoring by salmon boats will also be considered under that agenda item.

An alternate approach would be to close the area to fishing for scallops and anchoring by salmon boats through separate amendments to the Scallop FMP and the Salmon FMP, accompanied by Federal rulemaking, but we prefer the State to take action, as the State has been delegated responsibility for managing these fisheries.¹ Also, the proposed prohibition on anchoring by salmon vessels in the Sitka Pinnacles Marine Reserve is naturally linked with the State's consideration of whether to close the area to fishing altogether, which would in effect create a small marine reserve, as the proponents of this measure intended.

Therefore, we propose to proceed with a modified Amendment 59 and with rulemaking prohibiting groundfish fishing in the Sitka Pinnacles Marine Reserve; to proceed with rulemaking under the Northern Pacific Halibut Act to prohibit fishing for halibut in the reserve; to continue working with the State on the salmon anchoring prohibition; and to leave it to the Council's discretion whether to work with the State on further action on the scallop question.

Sincerely,

For 
Steven Pennoyer
Administrator, Alaska Region

¹ Amendment 3 to the Scallop FMP, effective July 1998, deferred all management measures (including closed waters) to the State of Alaska.

Addendum to the HAPC Analysis

Biomass and Species Composition Within Proposed Marine Protected Areas
 By Cathy Coon, NPFMC Staff

One aspect of marine protected areas that is often overlooked is the protection they may provide to non-target species and other living biota that provides habitat. This section of the analysis attempts to address the question of "In addition to Gorgonian corals, what else is found on the bottom within the proposed marine protected areas?"

Species composition and relative abundance of fish and invertebrates within the proposed Gorgonian coral HAPC conservation areas were examined using species catch information from NMFS trawl surveys for years 1990-1997. Locations of research trawls were plotted in conjunction with hauls that met the HAPC Gorgonian criteria (>2400 kg/km²) from years 1954-1998 for the Attu, Kiska, Amlia, Kenai, Yakutat, and Dixon areas (Figures 1-6). The mapping allowed visual examination of the bathymetric contours within proposed HAPC areas that had presence of Gorgonian corals in the upper half of the distribution based on weight.

This analysis summarized both species richness (number of species) and sum of biomass of each species based on average CPUE (kg/km²) of the last three trawl surveys. A summary of biomass and species richness is shown in the adjacent table. Note that the highest number of species were taken in the Attu Island areas; many invertebrate species found here were not found in the other areas. The highest biomass also were taken in the Aleutian areas, particularly in the Kiska area.

Species composition of research trawls taken in each of these HAPC areas were catalogued and categorized by mean weight (kg/km²). A full species list of HAPC areas grouped by Aleutian Island and Gulf of Alaska regions are attached in Tables 1 - 2. A summary of the most abundant species

within each area is shown in the adjacent table. Note that POP was the most abundant species in the Aleutian Islands areas and high in the Dixon Entrance area. It is also interesting that gorgonian coral and sponges were among the highest biomass taken in the Aleutian Islands, while coral predominates in the Kenai and Dixon areas. This analysis examined species composition from 1990-1997 research trawl locations and did not reflect the sites of high abundance of Gorgonian in earlier surveys.

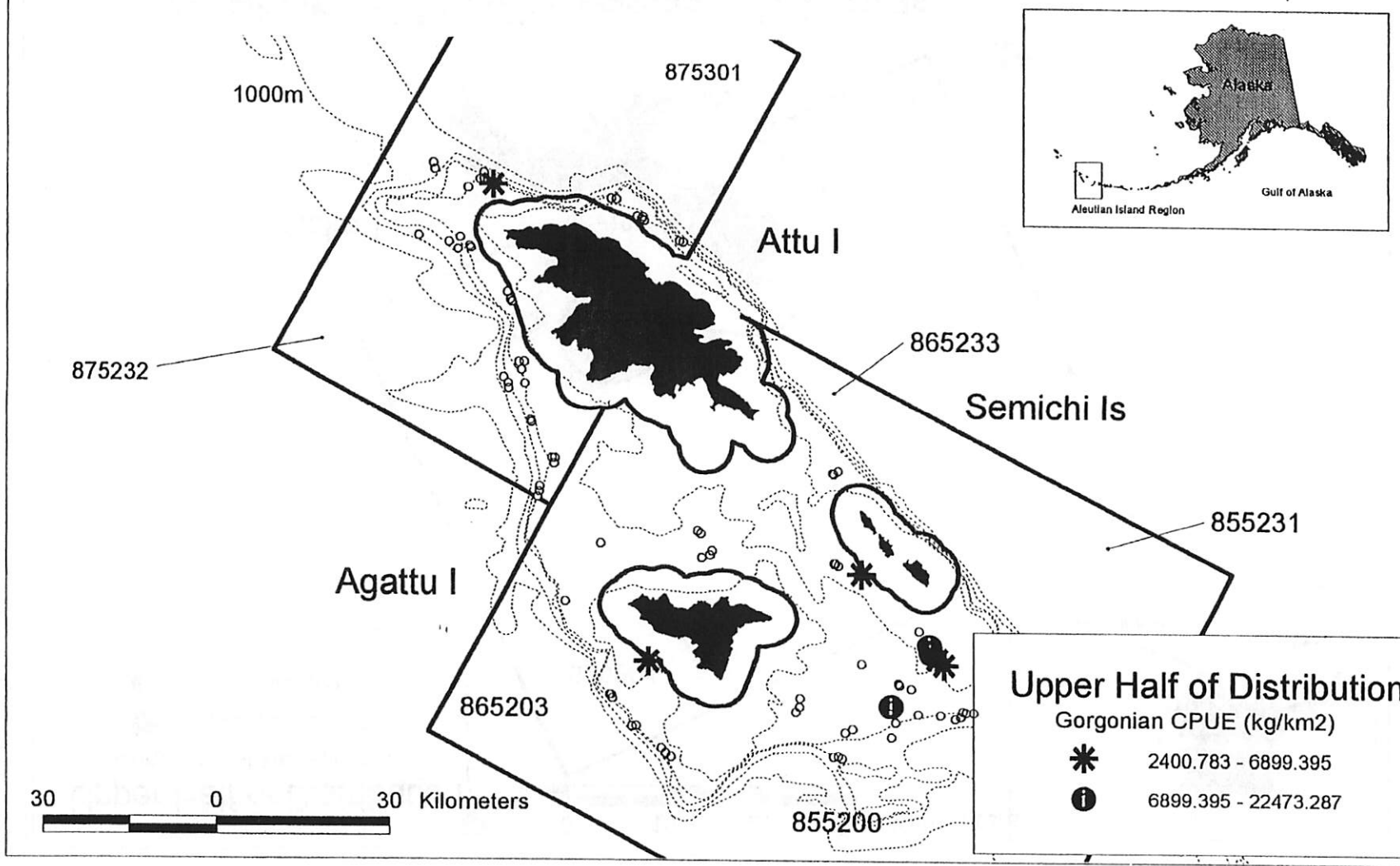
Biomass (kg/km²) and species richness within each of the proposed marine protected areas.

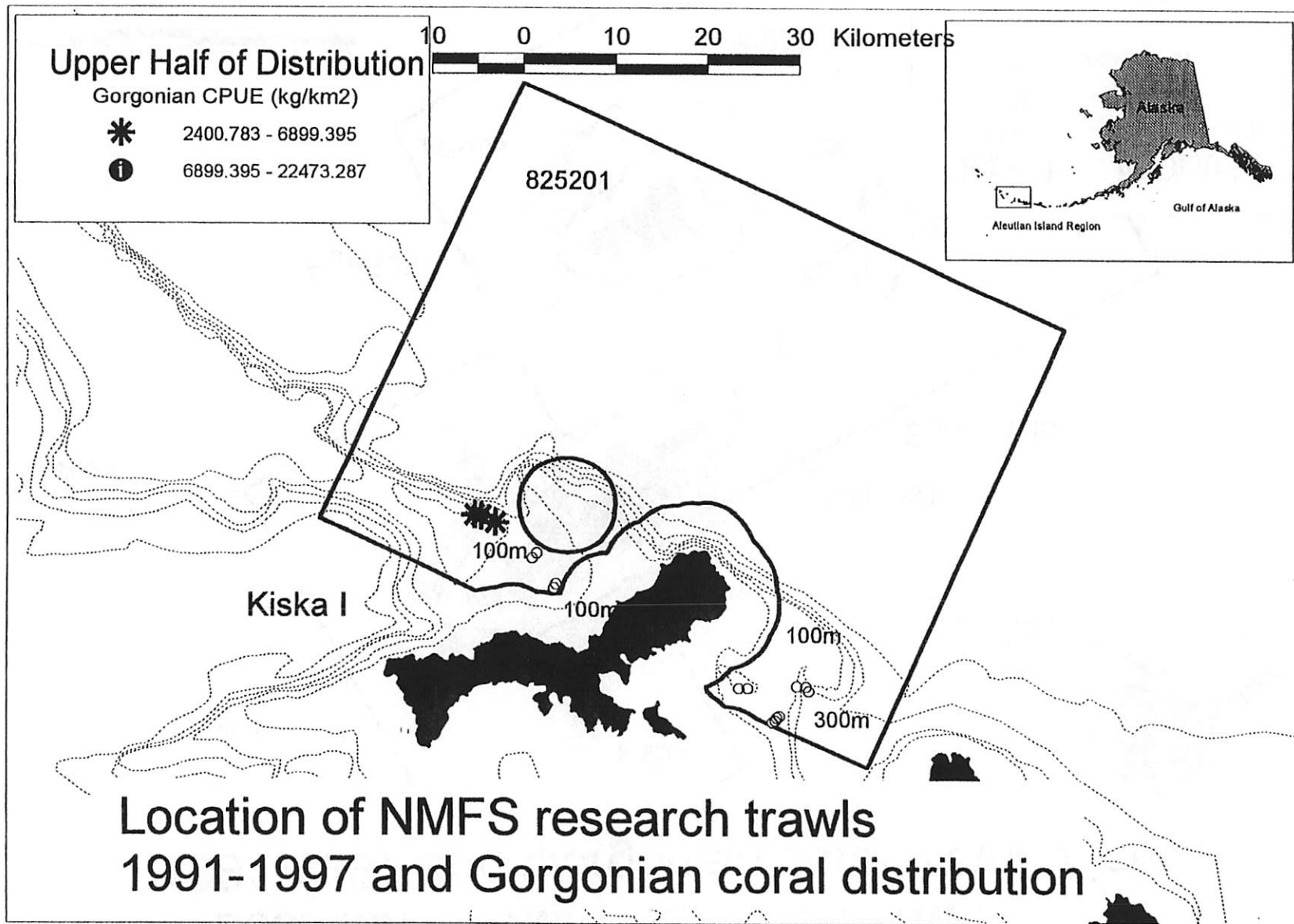
<u>Area</u>	<u>Biomass</u>	<u>Richness</u>
W. Attu	47,056	179
E. Attu	90,698	175
Kiska	176,419	136
Amlia	60,963	136
Kenai	25,319	66
Yakutat	14,051	109
Dixon	34,302	139

Most abundant species (by weight) within each of the proposed marine protected areas.

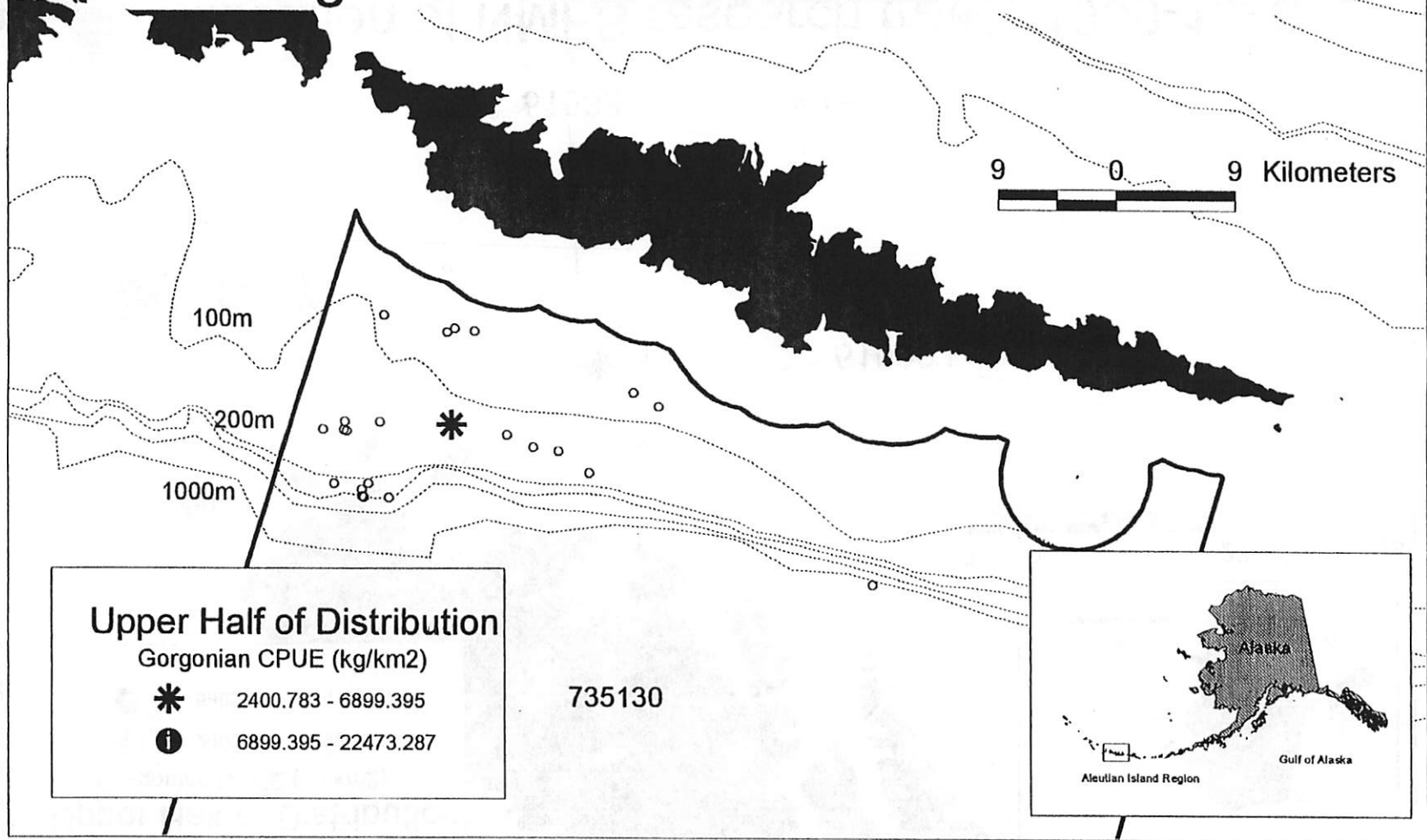
<u>Area</u>	<u>Species</u>
W. Attu	POP, mackerel, P cod, northern rockfish, Greenland turbot
E. Attu	POP, P. cod, Gorgonians, thornyheads, mackerel
Kiska	POP, mackerel, NR, pollock, sponges, basketstar, gorgonians
Amlia	POP, mackerel, sponges, shortrakers, rougheye
Kenai	arrowtooth, red tree coral, pollock, dusky rockfish, halibut, sablefish
Yakutat	arrowtooth, dusky rockfish, sleeper shark
Dixon	red tree coral, POP, sharpchin rockfish, redstripe rockfish, halibut

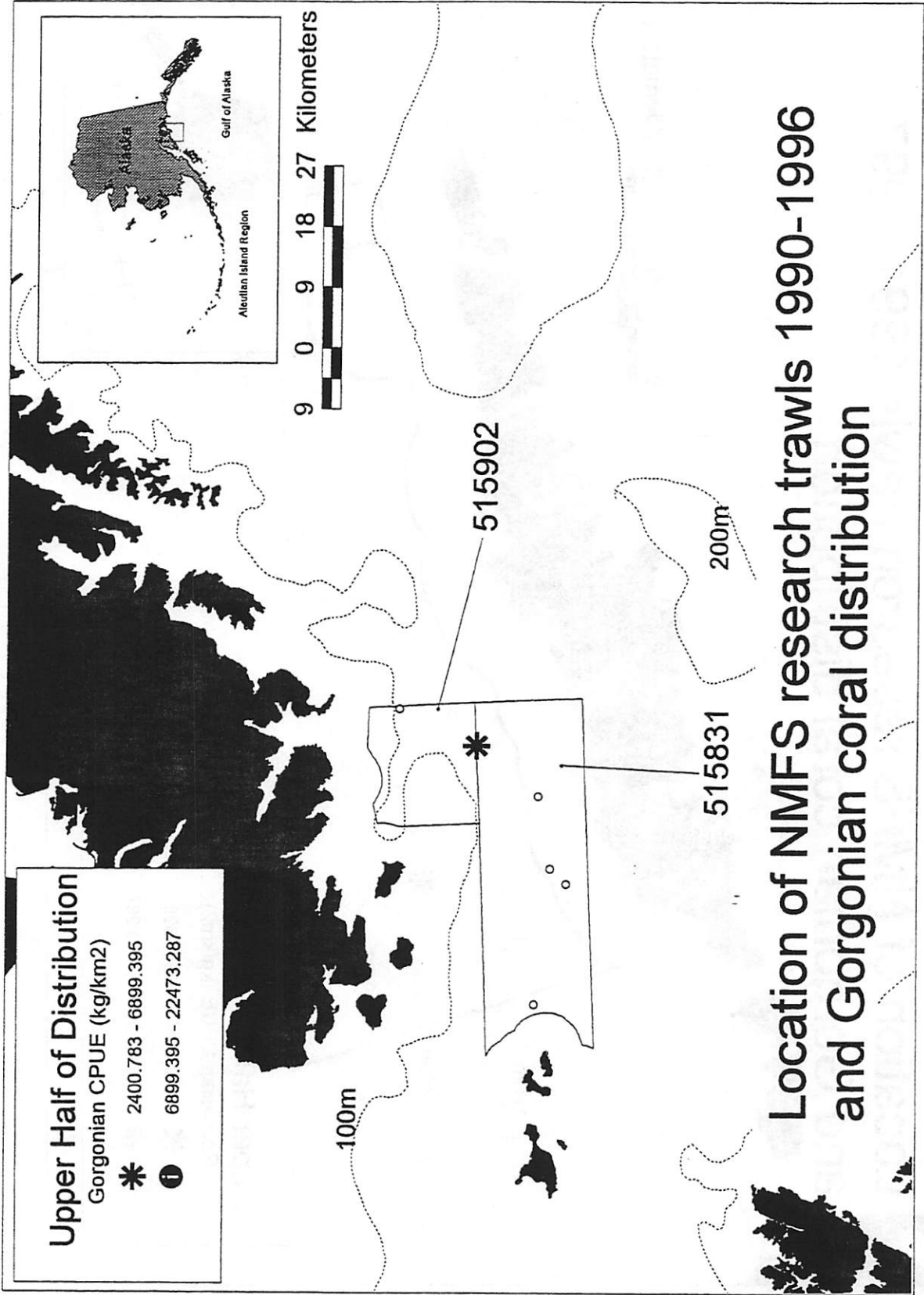
Location of NMFS research trawls 1991-1997 and Gorgonian coral distribution



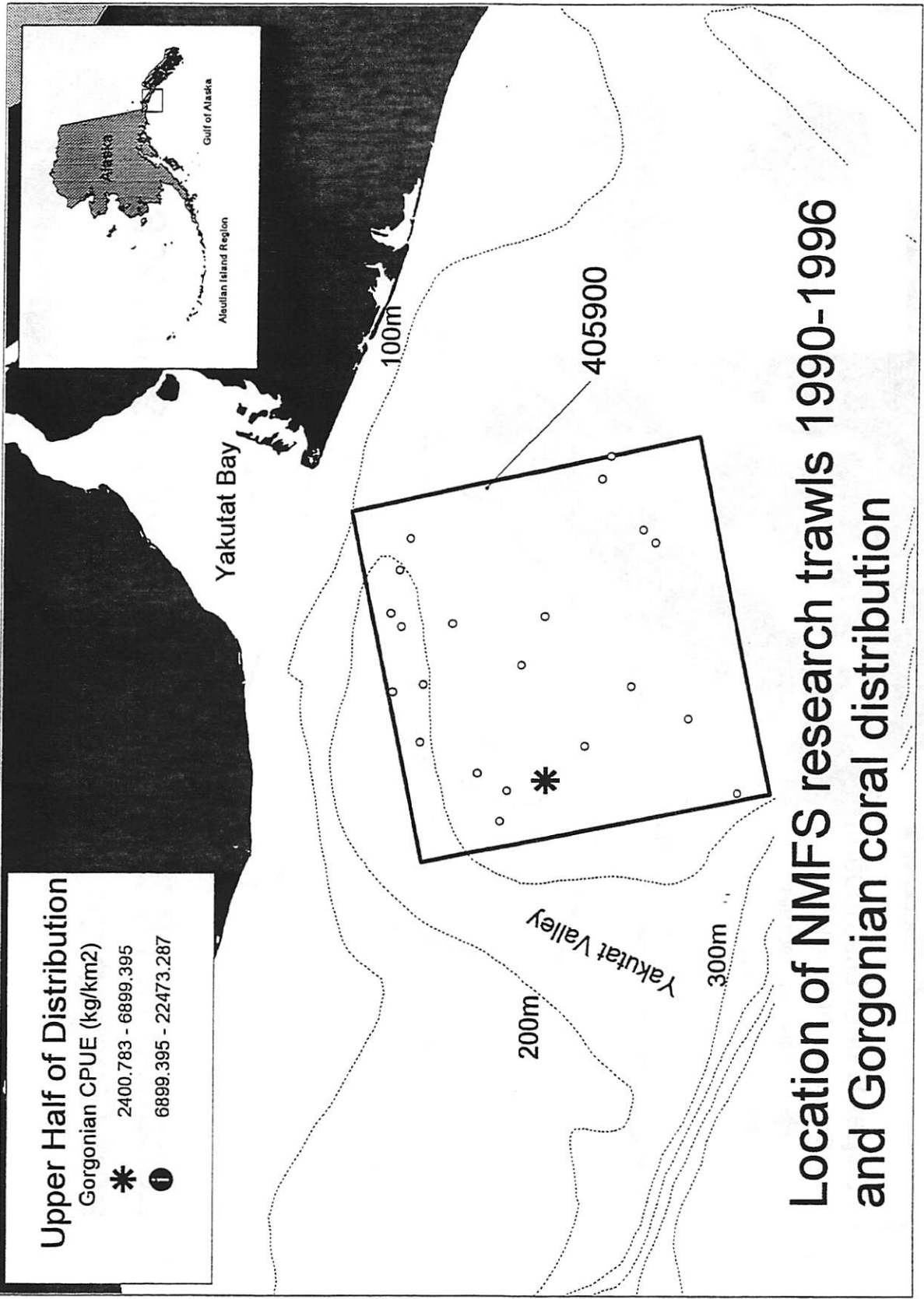


Location of NMFS research trawls 1991-1997 and Gorgonian coral distribution

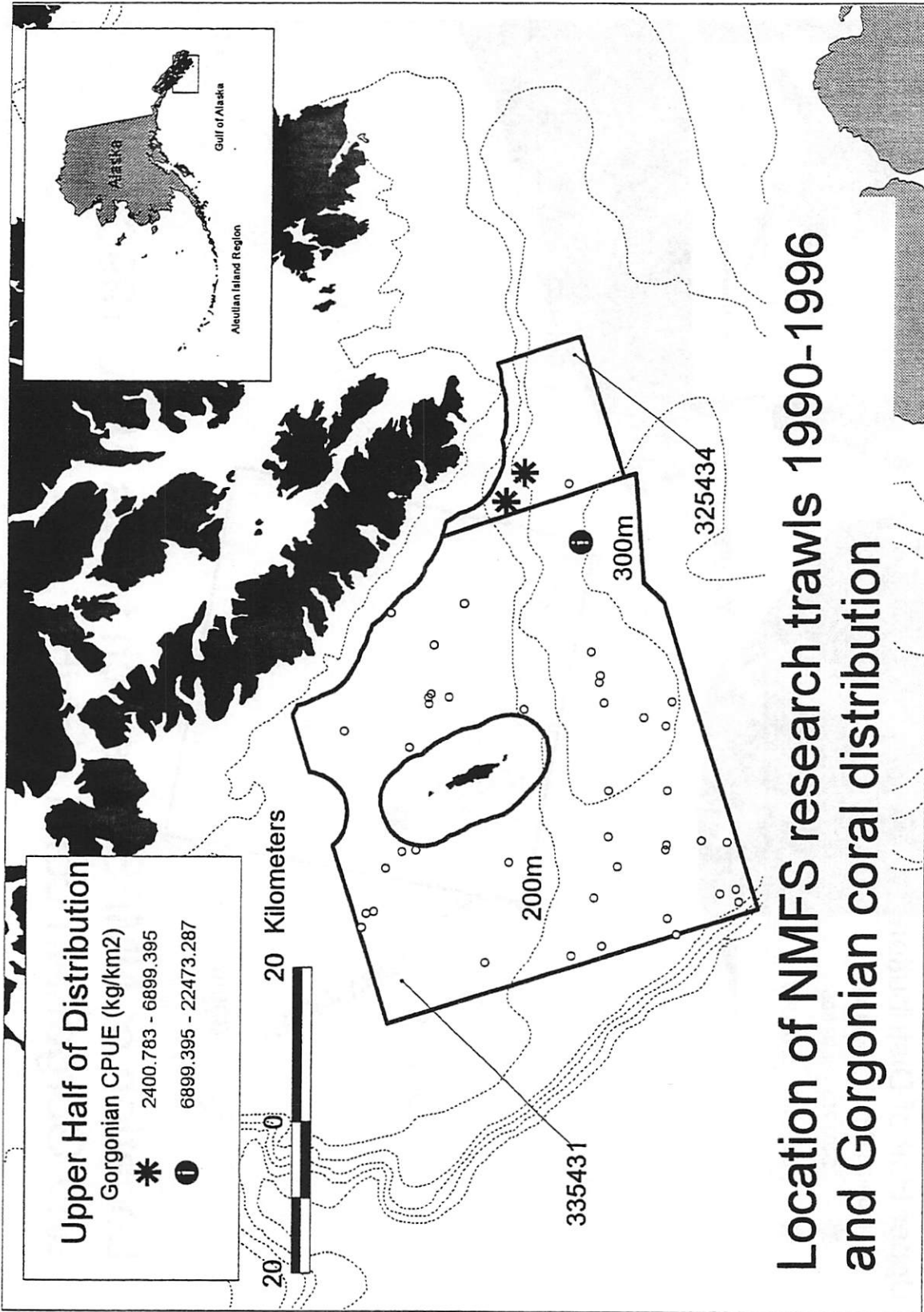




Location of NMFS research trawls 1990-1996 and Gorgonian coral distribution



Location of NMFS research trawls 1990-1996 and Gorgonian coral distribution



Location of NMFS research trawls 1990-1996 and Gorgonian coral distribution

Table 1. Mean catch (kg/km²) in proposed HAPC areas based on NMFS triennial surveys years 1991-1997. HAPC areas are composed of ADF&G statistical areas and include: W. Attu 875232, 875301; E. Attu 865203,865233,855200,855231; Kiska 825201; Amliia 735130.

Common Name	Latin Name	W.Attu	E. Attu	Amliia	Kiska
Alaska falsejingle	<i>Pododesmus macroschisma</i>	2.3	0.4	8.3	3.4
Alaska skate	<i>Bathyraja parmifera</i>	522.1	514.0	164.4	670.3
Alaska volute	<i>Arctomelon stearnsii</i>	4.0	8.8	5.5	-
Aleutian hermit	<i>Pagurus aleuticus</i>	-	1.2	-	-
Aleutian skate	<i>Bathyraja aleutica</i>	385.8	-	388.6	490.1
Amphilaphis sp.	<i>Amphilaphis sp.</i>	-	-	-	80.1
Amphiophiura ponderosa	<i>Amphiophiura ponderosa</i>	2.6	23.3	-	-
Aphrodita sp.	<i>Aphrodita sp.</i>	-	2.9	-	-
Arctic argid	<i>Argis dentata</i>	1.9	-	-	-
armorhead sculpin	<i>Gymnocanthus galeatus</i>	7.0	20.0	-	10.5
arrowtooth flounder	<i>Atheresthes stomias</i>	1575.3	1180.8	102.7	1738.8
Arthrogorgia sp.	<i>Arthrogorgia sp.</i>	-	-	-	8.7
artic batstar	<i>Ceramaster arcticus</i>	-	-	-	4.9
ascidian family Polyclinidae	<i>Synoicum sp.</i>	-	-	2.2	-
Atka mackerel	<i>Pleurogrammus monopterygius</i>	7488.7	1728.6	8843.7	45699.8
Balanus sp.	<i>Balanus sp.</i>	-	52.6	-	-
ball sponge	<i>Tethya sp.</i>	214.6	-	429.6	110.6
barnacle unident.	<i>Thoracica (order)</i>	131.2	-	-	1.1
barnacles (class)	<i>Cirripedia (class)</i>	-	-	-	4.5
barrel sponge	<i>Halichondria panicea</i>	12.8	-	4674.2	-
basketstar	<i>Gorgonocephalus caryi</i>	-	-	21.7	643.4
basketstarfish unident.	<i>Basketstarfish unident.</i>	314.6	366.5	110.6	5254.4
Bathymaster derjugini	<i>Bathymaster derjugini</i>	-	-	-	4.9
Bathyplores sp.	<i>Bathyplores sp.</i>	9.0	25.8	-	-
Bathyplores sp.	<i>Bathyplores sp.</i>	-	-	60.2	-
Bathyraja sp.	<i>Bathyraja sp.</i>	41.9	93.0	-	-
Bathyraja sp. egg case	<i>Bathyraja sp. egg case</i>	2.7	0.4	-	-
batstar sp	<i>Ceramaster sp.</i>	-	-	-	2.7
beaked barnacle	<i>Balanus rostratus</i>	-	-	2.0	-
Bering skate	<i>Bathyraja interrupta</i>	18.7	10.9	-	17.9
Beringius kennicottii	<i>Beringius kennicottii</i>	2.8	-	-	-
Beringius sp.	<i>Beringius sp.</i>	-	-	0.9	-
bigmouth sculpin	<i>Hemitripterus bolini</i>	142.3	495.4	105.2	-
black eelpout	<i>Lycodes diapterus</i>	1.0	1.2	-	-
black papillate sponge	<i>Halichondria sitiens</i>	2.8	-	90.4	88.4
blackfin poacher	<i>Bathyagonus nigripinnis</i>	1.2	6.2	-	-
blackfin sculpin	<i>Malacocottus kincaidi</i>	4.6	4.9	-	138.7
blackfinned snailfish	<i>Careproctus cypselurus</i>	30.5	-	-	-
black-orange spud sponge	<i>Polymastia pachymastia</i>	-	-	-	2.6
blacktail snailfish	<i>Careproctus melanurus</i>	26.9	-	-	-
bloodstar	<i>Henricia leviuscula</i>	-	-	0.8	-
bloodstar rare subtidal	<i>Henricia aspera</i>	-	-	-	-
brittlestarfish sp.	<i>Ophiopholis sp.</i>	-	-	0.2	-
brittlestarfish unident.	<i>Ophiuroid unident.</i>	4.2	4.5	3.9	-
Bryozoan unid.	<i>Bryozoan unid.</i>	7.6	5.5	113.5	6.4
bryozoan unident.	<i>bryozoan unident.</i>	-	1.5	-	-
Buccinum sigmatopleura	<i>Buccinum sigmatopleura</i>	-	1.2	-	-
California headlightfish	<i>Diaphus theta</i>	0.4	-	-	-
Callogorgia sp.	<i>Callogorgia sp.</i>	2.3	10.6	-	-
Careproctus sp.	<i>Careproctus sp.</i>	0.4	-	-	-
Caryophyllia sp.	<i>Caryophyllia sp.</i>	1.5	-	-	-
Ceramaster sp.	<i>Ceramaster sp.</i>	6.5	8.1	-	-
Chlamys sp.	<i>Chlamys sp.</i>	4.0	1.7	-	3.4
chum salmon	<i>Oncorhynchus keta</i>	96.4	123.8	-	-
Cirripedia (class)	<i>Cirripedia (class)</i>	94.8	400.6	-	-
clay pipe sponge	<i>Aphrocallistes vastus</i>	72.7	6.0	8.8	4.3
clay pipe sponge sp.	<i>Aphrocallistes sp.</i>	-	-	1811.5	-
cloud sponge	<i>Leucandra sp.</i>	582.9	-	-	-
club sponge	<i>Stylissa sp.</i>	-	59.9	-	578.6
comb jelly unident.	<i>Ctenophora (phylum)</i>	10.2	-	-	-
compound ascidian unident.		27.1	2.6	153.7	7.3
coonstripe shrimp	<i>Pandalus hypsinotus</i>	-	-	0.8	-

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<u>Common Name</u>	<u>Latin Name</u>	<u>W.Attu</u>	<u>E. Attu</u>	<u>Amlia</u>	<u>Kiska</u>
coral unident.	<i>Gorgonacea (order)</i>	9.8	2.1	2837.1	2999.5
crab unident.		-	0.6	-	-
Crangon sp.	<i>Crangon sp.</i>	-	2.4	-	-
Cranopsis major	<i>Cranopsis major</i>	-	-	-	1.3
crested bigscale	<i>Poromitra crassiceps</i>	0.4	-	-	-
crinoid unident.		11.1	-	2.7	1.1
Crossaster borealis	<i>Crossaster borealis</i>	-	117.0	-	-
Crossaster sp.	<i>Crossaster sp.</i>	1.6	55.0	-	-
Cucumaria fallax	<i>Cucumaria fallax</i>	224.9	21.8	-	-
Cucumaria japonica	<i>Cucumaria japonica</i>	40.8	63.1	-	-
cushion star	<i>Pteraster tessellatus</i>	-	-	3.8	8.1
cushion star sp.	<i>Pteraster sp.</i>	-	-	3.0	0.9
daisy brittlestar	<i>Ophiopholis aculeata</i>	-	-	7.0	4.2
dark dusky rockfish	<i>Sebastes new species</i>	-	6.8	-	-
darkfin sculpin	<i>Malacocottus zonurus</i>	21.9	25.0	547.6	60.2
depressed scale worm	<i>Eunoe depressa</i>	-	-	-	-
Diplopteraster multipes	<i>Diplopteraster multipes</i>	9.2	-	-	-
Dipsacaster borealis	<i>Dipsacaster borealis</i>	2.2	3.2	-	-
Dover sole	<i>Microstomus pacificus</i>	26.9	26.3	-	-
dusky rockfish	<i>Sebastes ciliatus</i>	29.3	-	898.1	167.2
eastern Pacific bobtail	<i>Rossia pacifica</i>	2.9	4.6	1.4	-
eelpout unident.	<i>Zoarcidae</i>	2.0	17.7	-	-
empty bivalve shells		-	-	145.5	13.9
empty gastropod shells		-	-	-	0.5
Errinopora sp.	<i>Errinopora sp.</i>	-	-	-	0.9
Eumicrotremus sp.	<i>Eumicrotremus sp.</i>	3.3	0.8	-	-
Evasterias echinosoma	<i>Evasterias echinosoma</i>	8.6	3.1	-	-
Evasterias sp.	<i>Evasterias sp.</i>	3.6	-	-	-
falsejingles unident.	<i>Anomiidae</i>	-	1.0	-	-
fiberoptic sponge	<i>Hydonema sp.</i>	5.7	0.8	-	6.5
fish eggs unident.		2.2	-	-	-
flathead sole	<i>Hippoglossoides elassodon</i>	160.3	646.0	-	1459.1
flattened bryozoan	<i>Porella compressa</i>	-	-	0.4	0.7
fourhorn poacher	<i>Hypsagonus quadricornis</i>	0.4	2.4	-	-
garter whelk	<i>Colus periscelidus</i>	-	2.1	-	-
Gephyreaster swifti	<i>Gephyreaster swifti</i>	7.4	29.2	-	-
giant barnacle	<i>Balanus evermanni</i>	11.9	366.8	5.6	10.1
giant grenadier	<i>Albatrossia pectoralis</i>	1792.7	98.1	-	-
giant octopus	<i>Octopus dofleini</i>	-	245.1	319.0	-
giant orange tochiui	<i>Tochuina tetraquetra</i>	-	2.2	-	-
glass sponge unident.	<i>Hexactinellida</i>	1410.7	-	-	-
golden king crab	<i>Lithodes aequispina</i>	70.1	14.2	90.8	251.3
Gorgonia coral_1	<i>Calcigorgia spiculifera</i>	-	-	-	0.7
Gorgonia coral_2	<i>Callogorgia sp.</i>	-	-	55.3	1025.4
Gorgonocephalus caryi	<i>Gorgonocephalus caryi</i>	13.9	23.8	-	-
graceful decorator crab	<i>Oregonia gracilis</i>	2.3	3.6	2.1	0.9
great sculpin	<i>Myoxocephalus polyacanthocephalus</i>	126.5	193.9	157.1	276.7
green papillate sponge	<i>Halichondria cf. sitiens</i>	14.3	0.4	16.3	34.1
green sea urchin	<i>Strongylocentrotus droebachiensis</i>	39.4	52.5	28.6	22.9
Greenland turbot	<i>Reinhardtius hippoglossoides</i>	1842.5	535.4	-	-
greenling unident.	<i>Hexagrammidae</i>	-	7.2	-	-
hairy cockle	<i>Clinocardium ciliatum</i>	-	0.8	-	-
hairy hermit crab	<i>Pagurus capillatus</i>	-	1.2	-	-
harlequin rockfish	<i>Sebastes variegatus</i>	4.4	15.9	17.2	-
Henricia aspera	<i>Henricia aspera</i>	1.3	-	-	-
Henricia leviuscula	<i>Henricia leviuscula</i>	4.2	-	-	-
Henricia sp.	<i>Henricia sp.</i>	6.7	3.7	-	8.5
hermit crab unident.	<i>Paguridae</i>	2.7	7.6	5.6	-
hermit sponge	<i>Suberites ficus</i>	-	11.2	15.6	1.3
Hippasteria sp.	<i>Hippasteria sp.</i>	4.6	4.5	-	-
Hippasteria sp.	<i>Hippasteria sp.</i>	-	-	2.4	5.8
Hippasteria spinosa	<i>Hippasteria spinosa</i>	6.8	28.2	-	-

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Hippasteria spinosa.	<i>Hippasteria spinosa</i>	-	-	2.7	3.6
horsehair crab	<i>Enimacrus isenbeckii</i>	-	4.2	-	6.6
Hyas sp.	<i>Hyas sp.</i>	4.4	2.1	-	-
hydrocoral	<i>Errinopora sp.</i>	-	-	-	8.2
hydroid unident.		9.2	5.1	0.9	11.2
Iceland scallop	<i>Chlamys behringiana</i>	7.1	5.7	-	4.5
Icelus sp.	<i>Icelus sp.</i>	-	-	-	-
invertebrate unident.		-	-	-	887.7
Japelon aleutica	<i>Japelon aleutica</i>	-	1.7	-	-
jellyfish unident.	<i>Scyphozoa (class)</i>	71.8	220.7	49.8	157.0
Kamchatka flounder	<i>Atheresthes evermanni</i>	709.1	198.5	69.0	323.7
kelp greenling	<i>Hexagrammos decagrammus</i>	-	-	438.5	16.5
kuro argid	<i>Argis lar</i>	2.2	-	-	-
ladder whelk	<i>Buccinum scalariforme</i>	-	2.0	-	-
lanternfish unident.	<i>Myctophidae</i>	4.7	1.4	-	-
leafy bryozoan	<i>Flustra serrulata</i>	-	4.5	-	-
leech unident.	<i>Hirudinea unident.</i>	-	-	0.4	-
left-hand whelk	<i>Volutopsius harpa</i>	-	5.6	-	-
leister sculpin	<i>Enophrys lucasi</i>	-	-	9.4	-
Leptychaster arcticus	<i>Leptychaster arcticus</i>	0.2	2.1	-	-
Lethasterias nanimensis	<i>Lethasterias nanimensis</i>	5.6	8.5	-	-
light dusky rockfish	<i>Sebastes new species a</i>	-	7.9	-	-
limpet unident.		2.2	-	-	-
Liparis sp.	<i>Liparis sp.</i>	2.5	-	-	-
Lithodes couesi	<i>Lithodes couesi</i>	60.1	-	-	-
Lithodes sp.	<i>Lithodes sp.</i>	-	-	-	-
longfin Irish lord	<i>Hemilepidotus zapus</i>	-	2.6	-	48.7
Longhorned decorator crab	<i>Chorilia longipes</i>	-	-	-	-
longnose poacher	<i>Sarritor leptorhynchus</i>	4.4	14.6	-	2.6
longnose skate	<i>Rhinoraja longii</i>	-	-	134.1	34.4
Lophaster furcilliger	<i>Lophaster furcilliger</i>	2.6	-	-	-
Luidiaster dawsoni	<i>Luidiaster dawsoni</i>	2.6	2.6	-	-
lumpsucker unident.	<i>Cyclopteridae</i>	0.9	-	-	-
lumpsucker unident.	<i>Eumicrotremus sp.</i>	-	-	-	1.1
lyre crab	<i>Hyas sp.</i>	-	-	1.1	-
magistrate armhook squid	<i>Beryteuthis magister</i>	130.5	82.8	19.9	51.4
Metridium sp.	<i>Metridium sp.</i>	-	6.2	-	-
military cushion star	<i>Pteraster militaris</i>	-	-	4.1	1.5
mussel unident.	<i>Mytilidae</i>	4.6	-	1.3	-
Natica sp.	<i>Natica sp.</i>	-	4.3	-	-
Northern flashlightfish	<i>Protomyctophum thompsoni</i>	-	-	-	-
Northern horsemussel	<i>Modiolus modiolus</i>	-	-	9.1	-
Northern lampfish	<i>Stenobranchius leucopsarus</i>	2.1	-	-	-
northern rock sole	<i>Lepidopsetta peracuada</i>	483.5	1257.1	157.2	1232.0
northern rockfish	<i>Sebastes polyspinis</i>	2019.5	729.6	2608.2	11308.4
Northern shrimp	<i>Pandalus borealis</i>	13.7	2.6	1.3	5.6
northern smoohtongue	<i>Leuroglossus schmidti</i>	2.9	-	-	-
nudibranch unident.		2.0	5.4	2.3	0.9
ocean shrimp	<i>Pandalus jordani</i>	5.6	-	-	-
octopus unident.		46.2	185.1	106.6	9.7
Ophiopholis aculeata	<i>Ophiopholis aculeata</i>	4.0	2.1	-	-
Ophiura sarsi	<i>Ophiura sarsi</i>	-	-	-	-
orange bat star	<i>Ceramaster patagonicus</i>	3.9	4.1	2.2	7.8
Oregon rock crab	<i>Cancer oregonensis</i>	-	-	1.6	-
Oregon triton	<i>Fusitriton oregonensis</i>	3.1	5.0	18.1	2.6
Pacific cod	<i>Gadus macrocephalus</i>	2881.6	3042.5	742.8	8398.6
Pacific glass shrimp	<i>Pasiphaea pacifica</i>	-	-	-	-
Pacific halibut	<i>Hippoglossus stenolepis</i>	1678.4	1246.1	1009.4	988.5
Pacific lamprey	<i>Lampetra tridentata</i>	6.2	-	-	-
Pacific lyre crab	<i>Hyas lyratus</i>	11.6	2.2	6.8	2.4
Pacific ocean perch	<i>Sebastes alutus</i>	13182.7	61389.5	16641.4	60193.8
Pacific sand lance	<i>Ammodytes hexapterus</i>	31.6	207.2	-	-

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Pacific sleeper shark	<i>Somniosus pacificus</i>	-	-	1625.9	-
Pacific spiny lumpsucker	<i>Eumicrotremus orbis</i>	2.0	2.1	2.2	-
Pacific viperfish	<i>Chauliodus macouni</i>	1.1	-	-	-
Paragorgia arborea	<i>Paragorgia arborea</i>	1063.4	3041.9	-	-
Paragorgia sp.	<i>Paragorgia sp.</i>	122.3	-	-	-
Paragorgia unid.	<i>Paragorgia unid.</i>	-	2237.8	-	-
pearly prickleback	<i>Bryzoichthys marjorius</i>	2.1	-	-	-
Phiuroidea Unid.	<i>Phiuroidea Unid.</i>	-	-	-	-
poacher unident.	<i>Agonidae</i>	-	-	-	31.9
polar six armed sea star	<i>Leptasterias polaris</i>	-	-	-	3.2
polychaete worm unident.	<i>Polychaeta (class)</i>	1.1	-	-	-
ponderosa brittlestar	<i>Amphiophiura ponderosa</i>	-	-	-	1.9
Primnoa willeyi	<i>Primnoa willeyi</i>	-	2.2	-	-
prowfish	<i>Zaprora sienus</i>	327.6	91.9	170.7	546.1
Pseudarchaster parelii	<i>Pseudarchaster parelii</i>	5.0	2.2	-	-
Psolus fabricii	<i>Psolus fabricii</i>	2.2	2.7	-	-
Psolus japonicus	<i>Psolus japonicus</i>	-	1.6	-	-
Pteraster militaris	<i>Pteraster militaris</i>	5.6	5.1	-	-
Pteraster obscurus	<i>Pteraster obscurus</i>	32.2	-	-	-
Pteraster sp.	<i>Pteraster sp.</i>	2.6	1.6	-	3.9
Pteraster tessellatus	<i>Pteraster tessellatus</i>	4.8	25.4	-	-
purple hermit	<i>Elassochirus cavimanus</i>	1.9	-	0.4	-
red bat star	<i>Ceramaster japonicus</i>	-	-	4.6	-
red tree coral	<i>Primnoa willeyi</i>	-	-	19.4	3875.2
reddish scallop	<i>Chlamys rubida</i>	19.9	-	9.3	1.4
rex sole	<i>Glyptocephalus zachirus</i>	114.6	471.4	-	123.8
rhinoceros crab	<i>Rhinolithodes wosnessenskii</i>	-	-	1.8	-
Rhinoraja longii	<i>Rhinoraja longii</i>	105.0	28.5	-	-
ribbed sculpin	<i>Triglops pingeli</i>	-	4.2	-	-
rock sole sp.	<i>Lepidopsetta sp.</i>	552.2	1205.3	209.2	2623.5
rose sea star	<i>Crossaster papposus</i>	3.4	7.3	3.7	2.5
roughey rockfish	<i>Sebastes aleutianus</i>	136.6	804.6	3066.0	529.5
roughspine sculpin	<i>Triglops macellus</i>	-	4.2	-	-
sablefish	<i>Anoplopoma fimbria</i>	273.4	-	159.3	-
salmon snailfish	<i>Careproctus rastrinus</i>	-	-	-	3.3
saips unident.	<i>Thaliacea unident.</i>	6.9	3.6	84.0	5.4
sawback poacher	<i>Sarritor frenatus</i>	6.1	5.2	5.6	13.1
scale worm	<i>Eunoe sp.</i>	-	-	-	-
scale worm unident.	<i>Polynoidae</i>	2.1	3.3	-	-
scaled crab	<i>Placetron wosnessenskii</i>	-	3.3	4.0	-
scallop sp	<i>Chlamys sp.</i>	-	-	14.0	40.6
scallop sp.	<i>Chlamys sp.</i>	1.3	-	2.8	-
scissortail sculpin	<i>Triglops forficata</i>	9.2	11.1	11.2	28.2
sculpin unident.	<i>Cottidae</i>	-	-	2.7	-
sculptured shrimp	<i>Sclerocrangon boreas</i>	-	-	0.8	-
Scuplin (Myoxocephalus sp.)	<i>Myoxocephalus sp.</i>	147.2	342.1	-	-
sea anemone unident.	<i>Actinaria (order)</i>	7.4	24.1	2.7	-
sea ciod	<i>Molgula retortiformis</i>	-	-	-	23.3
sea cucumber Psolus sp.	<i>Psolus sp.</i>	-	-	1.5	-
sea cucumber sp.	<i>Cucumaria sp.</i>	-	-	-	92.6
sea cucumber unident.	<i>Holothuroidea unident.</i>	95.3	96.7	48.1	3.4
sea cucumber_1	<i>Cucumaria fallax</i>	-	-	99.7	24.5
sea grape	<i>Molgula griffithii</i>	-	-	2.8	-
sea peach	<i>Halocynthia aurantium</i>	-	-	6.2	7.1
sea peach unident.	<i>Halocynthia sp.</i>	-	1.6	-	-
sea pen unident.	<i>Pennatulacea (order)</i>	3.2	11.5	-	-
Sea Pork sp.	<i>Amaroucium sp.</i>	-	-	-	11.0
sea potato	<i>Styela rustica</i>	47.4	-	-	-
sea raven	<i>Hemitripteris villosus</i>	3.6	1.2	-	-
sea urchin unident.	-	-	111.7	-	53.1
searcher	<i>Bathymaster signatus</i>	61.4	25.7	18.8	39.0
seastar	<i>Gephyreaster swifti</i>	-	-	4.2	3.4

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seastar unknown	<i>Stephanasterias albula</i>	-	-	-	0.4
seastar, Henricia sp.	<i>Henricia sp.</i>	-	-	5.7	7.1
seastar, styasteridae	<i>Stylaster brochi</i>	-	-	-	44.0
seastar, styasteridae sp	<i>Stylaster sp.</i>	-	-	-	1573.9
Sebastolobus macrochir	<i>Sebastolobus macrochir</i>	12.6	-	-	-
shortfin eelpout	<i>Lycodes brevipes</i>	2.2	5.1	-	-
shortraker rockfish	<i>Sebastes borealis</i>	223.5	1276.2	3391.6	-
shortspine thornyhead	<i>Sebastolobus alascanus</i>	1525.5	1978.7	76.6	-
shrimp, Lebbeus	<i>Lebbeus groenlandicus</i>	-	-	-	9.7
shrimp Argis sp.	<i>Argis sp.</i>	-	-	-	-
sipunculid worm unident.	<i>Sipuncula (phylum)</i>	-	5.8	-	-
six armed sea star sp.	<i>Leptasterias sp.</i>	-	-	-	2.3
skate egg case unident.	-	2.8	4.1	-	-
skate unident.	<i>Rajidae unident.</i>	295.9	901.8	169.1	1115.1
slender eelblenny	<i>Lumpenus fabricii</i>	-	-	-	-
slender seawhip	<i>Stylatula sp.</i>	4.5	8.6	-	-
smooth lamellaria	<i>Velutina velutina</i>	-	-	-	2.2
smooth lumpsucker	<i>Aptocyclus ventricosus</i>	2.3	2.1	2.1	3.7
snail (gastropod) eggs	-	-	4.9	-	-
snail unident.	<i>Gastropod unident.</i>	-	-	1.3	-
snailfish sp.	<i>Careproctus sp.</i>	-	-	-	2.6
snailfish unident.	<i>Cyclopteridae (Liparidinae)</i>	3.8	2.8	-	11.7
soft coral unident.	<i>Alcyonacea (order)</i>	-	-	16.0	1890.1
soft green sponge	-	-	-	16.7	-
Solaster endeca	<i>Solaster endeca</i>	15.2	-	-	-
Solaster hypothrissus	<i>Solaster hypothrissus</i>	1.6	-	-	-
Solaster paxillatus	<i>Solaster paxillatus</i>	2.3	12.3	-	-
Solaster sp.	<i>Solaster sp.</i>	38.8	10.8	-	-
southern rock sole	<i>Lepidopsetta bilineata</i>	-	-	170.5	-
spectacled sculpin	<i>Triglops scepticus</i>	14.7	7.0	2.2	24.9
spinyhead sculpin	<i>Dasycottus setiger</i>	3.0	5.1	-	5.3
sponge hermit	<i>Pagurus brandti</i>	2.1	9.3	6.3	2.2
sponge sculpin	<i>Thyriscus anoplus</i>	4.4	-	0.8	-
sponge unid.	<i>porifera unid.</i>	-	-	38.2	-
sponge unid.	<i>porifera unid.</i>	-	19.8	-	-
sponge unident.	<i>Porifera</i>	834.1	154.3	4016.4	5859.3
spud sponge	<i>Polymastia sp.</i>	104.9	29.6	44.9	-
squid unident.	-	5.6	18.5	12.4	-
starfish family Astariidae_1	<i>Leptychaster arcticus</i>	-	-	-	-
starfish family Astariidae_2	<i>Lethasterias nanimensis</i>	-	-	7.3	6.8
starfish family Astariidae_3	<i>Luidiaster dawsoni</i>	-	-	1.5	3.9
starfish F. Asteropectinidae	<i>Dipsacaster borealis</i>	-	-	-	2.7
starfish F. Goniastaridae	<i>Pseudarchaster parelii</i>	-	-	-	2.7
starfish F. Pterasteridae	<i>Diplopteraster multipes</i>	-	-	8.9	11.2
starfish unident.	-	5.5	6.1	2.7	5.3
Stony coral unid.	<i>Scleractinia unid.</i>	-	7.8	125.6	-
stony coral unident.	<i>Scleractinia unident.</i>	4.2	-	38.7	88.8
striped sea leech	<i>Carcinobdella cyclostomum</i>	0.2	-	-	-
sturgeon poacher	<i>Podothecus acipenserinus</i>	6.2	27.4	5.2	4.7
Stylaster sp.	<i>Stylaster sp.</i>	17.7	4.3	-	-
sunstar paxillatus	<i>Solaster paxillatus</i>	-	-	5.6	9.1
sunstar sp.	<i>Solaster sp.</i>	-	-	3.3	13.8
Tanner crab(bairdi)	<i>Chionoecetes bairdi</i>	2.2	10.0	-	-
Tealia crassicornis	<i>Tealia crassicornis</i>	-	1.2	-	-
thick-ribbed whelk	<i>Colus spitzbergensis</i>	-	4.5	-	-
thorny sculpin	<i>Icelus spiniger</i>	3.4	2.2	-	-
Thouarella sp.	<i>Thouarella sp.</i>	-	-	18.8	-
transparent tunicate	-	-	2.1	-	-
tree sponge	<i>Mycale loveni</i>	33.2	33.3	251.4	333.0
tree sponge sp.	<i>Mycale sp.</i>	-	-	105.0	-
Triglops sp.	<i>Triglops sp.</i>	-	4.2	-	-
tube worm unident.	-	4.6	3.1	46.6	1.3

Table 1 (cont). Mean catch (kg/km²) in proposed HAPC areas based on NMFS triennial surveys years 1991-1997. HAPC areas are composed of ADF&G statistical areas and include: W. Attu 875232, 875301; E. Attu 865203,865233,855200,855231; Kiska 825201; Amlia 735130.

<u>Common Name</u>	<u>Latin Name</u>	<u>W.Attu</u>	<u>E. Attu</u>	<u>Amlia</u>	<u>Kiska</u>
tulip whelk	<i>Volutopsius middendorffii</i>	-	4.2	-	-
tunicate unident.	<i>Ascidian unident.</i>	11.4	2.4	13.9	2.0
twospine crangon	<i>Crangon communis</i>	-	4.5	-	-
unsorted shab		-	377.4	-	14.0
vase sponge		-	-	0.4	-
vermillion seastar sp.	<i>Aplidium sp.</i>	-	-	8.8	-
Volutopsius sp.	<i>Volutopsius sp.</i>	-	-	-	2.2
Volutopsius sp.	<i>Volutopsius sp.</i>	-	4.2	-	-
walleye pollock	<i>Theragra chalcogramma</i>	1300.1	483.9	1978.9	11206.3
wattied eelpout	<i>Lycodes palearis</i>	-	59.6	-	-
whelk sp.	<i>Beringius sp.</i>	-	-	0.4	-
whiteblotched skate	<i>Bathyraja maculata</i>	119.5	-	130.4	304.0
yellow bowl sponge		-	-	226.2	-
yellow Irish lord	<i>Hemilepidotus jordani</i>	68.8	145.1	127.5	114.5
yellowleg pandalid	<i>Pandalus tridens</i>	17.3	-	-	1.3
Yoldia sp.	<i>Yoldia sp.</i>	-	-	-	-

Summary Table 1.

	<u>W. Attu</u>	<u>E. Attu</u>	<u>Kiska</u>	<u>Amlia</u>
species richness	179	175	136	136
sum of biomass	47,056	90,698	60,963	176,419

Table 2. Mean catch (kg/km²) in proposed HAPC areas based on NMFS triennial surveys years 1990-1996. HAPC areas are composed of ADF&G statistical areas and include: Kenai 515831,515902; Yakutat 405900; Dixon 335431,325434.

Common name	Latin name	Kenai	Yakutat	Dixon
Alaska skate	<i>Bathyraja parmifera</i>	-	4.4	-
Alaska volute	<i>Arctomelon stearnsii</i>	5.0	1.1	-
Aleutian hermit	<i>Pagurus aleuticus</i>	-	3.8	-
Aphrodita sp.	<i>Aphrodita sp.</i>	-	0.3	-
arrowtooth flounder	<i>Atheresthes stomias</i>	9,996.1	1,967.8	1,655.0
Barnacles (class)	<i>Cirripedia (class)</i>	606.1	-	-
barrel sponge	<i>Halichondria panicea</i>	-	-	3.4
basketstar	<i>Gorgonocephalus caryi</i>	83.0	13.0	-
basketstarfish unident.	<i>Basketstarfish unident.</i>	-	12.4	-
Bathyplores sp.	<i>Bathyplores sp.</i>	4.3	-	1.8
Bering skate	<i>Bathyraja interrupta</i>	47.8	27.7	199.8
big skate	<i>Raja binoculata</i>	-	392.3	-
bigfin eelpout	<i>Lycodes cortezianus</i>	-	-	2.0
bigmouth sculpin	<i>Hemitripterus bolini</i>	-	-	346.4
bivalve sp.	<i>Chlamylla sp.</i>	12.1	-	-
black seastar	<i>Stylasterias forreri</i>	-	-	16.7
blackbelly eelpout	<i>Lycodes pacificus</i>	-	-	11.0
blackfin poacher	<i>Bathyagonus nigripinnis</i>	-	1.9	-
blackfin sculpin	<i>Malacocottus kincaidii</i>	-	1.1	-
blackmouth eelpout	<i>Lycodapus fierasfer</i>	-	-	0.9
blacktail snailfish	<i>Careproctus melanurus</i>	-	-	4.8
Blood Star	<i>Henricia leviuscula</i>	3.1	-	-
box crab	<i>Lopholithodes foraminatus</i>	4.8	29.7	10.5
box crab unident.	<i>Lopholithodes sp.</i>	-	46.8	-
brachiopod unident.	-	-	2.9	0.9
brittlestarfish unident.	<i>Ophiuroid unident.</i>	-	-	0.1
Buccinum sp.	<i>Buccinum sp. (snail)</i>	1.6	-	-
californaea lampshell	<i>Laqueus californianus</i>	-	0.5	-
Californaea sea cucumber	<i>Parastichopus californicus</i>	-	-	20.7
capelin	<i>Mallotus villosus</i>	-	1.4	-
chinook salmon	<i>Oncorhynchus tshawytscha</i>	-	-	2.6
chum salmon	<i>Oncorhynchus keta</i>	-	94.9	169.9
clay pipe sponge	<i>Aphrocallistes vastus</i>	10.8	10.5	66.0
cloud sponge	<i>Leucandra sp.</i>	-	-	6.8
coho salmon	<i>Oncorhynchus kisutch</i>	-	-	9.9
comb jelly unident.	<i>Ctenophora (phylum)</i>	-	1.7	-
common lampshell	<i>Terebratalia transversa</i>	-	1.1	-
common mud star	<i>Ctenodiscus crispatus</i>	-	3.5	-
compound ascidian unident.	-	13.2	-	-
coonstripe shrimp	<i>Pandalus hypsinotus</i>	-	-	1.7
crinoid unident.	<i>crinoid unid.</i>	-	1.0	0.9
daisy brittlestar	<i>Ophiopholis aculeata</i>	-	0.2	0.4
darkblotched rockfish	<i>Sebastes crameri</i>	-	5.5	-
darkfin sculpin	<i>Malacocottus zonurus</i>	12.4	0.9	24.2
decorated warbonnet	<i>Chirolophis decoratus</i>	-	-	2.9
Dover sole	<i>Microstomus pacificus</i>	199.3	577.6	403.6
dusky rockfish	<i>Sebastes ciliatus</i>	2,432.6	1,494.1	1,646.4
Eastern Pacific bobtail	<i>Rossia pacifica</i>	-	1.0	1.1
empty gastropod shells	-	-	-	4.1
english sole	<i>Parophrys vetulus</i>	60.1	-	33.0
eulachon	<i>Thaleichthys pacificus</i>	2.4	172.4	92.3
flathead sole	<i>Hippoglossoides elassodon</i>	336.6	403.3	15.1
fuzzy crab	<i>Acantholithodes hispidus</i>	-	-	5.5
galatheid crab unident.	<i>Galatheidæ (family)</i>	-	-	0.4
golden king crab	<i>Lithodes aequispina</i>	-	-	33.7
graceful decorator crab	<i>Oregonia gracilis</i>	1.6	-	-
green sea urchin	<i>Strongylocentrotus droebachiensis</i>	225.9	12.0	35.4
greenstriped rockfish	<i>Sebastes elongatus</i>	-	-	116.8
grenadier unident.	<i>Macrouridae</i>	-	-	0.1
grunt sculpin	<i>Rhamphocottus richardsoni</i>	0.8	-	-
hairy tunicate	<i>Halocynthia hispidus</i>	-	2.0	-
harlequin rockfish	<i>Sebastes variegatus</i>	204.0	-	32.6

Table 2 (cont.). Mean catch (kg/km²) in proposed HAPC areas based on NMFS triennial surveys years 1990-1996. HAPC areas are composed of ADF&G statistical areas and include: Kenai 515831,515902; Yakutat 405900; Dixon 335431,325434.

<u>Common name</u>	<u>Latin name</u>	<u>Kenai</u>	<u>Yakutat</u>	<u>Dixon</u>
heart urchin	<i>Brisaster latifrons</i>	-	2.1	-
heart urchin unident.	class <i>echinoidea</i>	-	206.3	3.8
Hermit crab pagurus sp.	<i>Pagurus sp.</i>	-	1.0	-
hermit crab unident.	<i>Paguridae</i>	15.7	-	3.1
hermit sponge	<i>Suberites ficus</i>	2.5	-	-
invertebrate unident.	-	-	590.1	103.2
isopod unident.	<i>Isopoda (order)</i>	-	-	0.1
japanese cucumber	<i>Stichopus japonicus</i>	-	4.7	-
jellyfish Schyphozoa	<i>Cyanea capillata</i>	-	-	30.4
jellyfish unident.	<i>Scyphozoa (class)</i>	50.8	676.4	100.7
Kennicotts whelk	<i>Beringius kennicottii</i>	-	2.1	-
lampfish unid.	<i>Stenobranchius sp.</i>	-	1.1	-
lampshade sponge	<i>Mycale bellabellensis</i>	-	-	26.2
lanternfish unident.	<i>Myctophidae</i>	-	-	1.8
leaf eualid	<i>Eualus macilenta</i>	-	-	0.1
light dusky rockfish	<i>Sebastes new species a</i>	57.8	67.0	68.6
lingcod	<i>Ophiodon elongatus</i>	-	205.9	187.2
longfinger hermit	<i>Pagurus rathbuni</i>	-	4.1	-
Longhorned decorator crab	<i>Chorilla longipes</i>	-	-	0.6
longnose skate	<i>Raja rhina</i>	427.2	145.4	379.2
lumpsucker unident.	<i>Cyclopteridae</i>	-	-	0.9
Lyre crab sp.	<i>Hyas sp.</i>	4.9	-	-
lyre whelk	<i>Neptunea lyrata</i>	14.4	-	-
magistrate armhook squid	<i>Beryteuthis magister</i>	-	45.9	35.4
morning sunstar	<i>Solaster dawsoni</i>	-	2.5	3.5
mud star sp.	<i>Ctenodiscus sp.</i>	-	8.8	-
	<i>Arteidiellus sp.</i>	-	-	7.1
	<i>Lycodapus sp.</i>	-	-	1.3
sculpin sp.	<i>Malacocottus sp.</i>	-	-	30.2
Northern lampfish	<i>Stenobranchius leucopsarus</i>	-	1.6	-
Northern rockfish	<i>Sebastes polyspinis</i>	49.9	-	-
Northern shrimp	<i>Pandalus borealis</i>	-	16.7	89.1
Northern sunstar	<i>Solaster endeca</i>	1.1	1.3	-
nudibranch Tritonia sp.	<i>Tritonia sp.</i>	-	-	37.4
nudibranch unident.	<i>Nudibranchia (order)</i>	0.6	1.2	13.9
ocean shrimp	<i>Pandalus jordani</i>	-	23.4	155.4
octopus unident.	<i>Octopodidae (family)</i>	-	-	3.4
orange bat star	<i>Ceramaster patagonicus</i>	1.9	3.1	1.7
orange-pink sea urchin	<i>Allocentrotus fragilis</i>	26.7	70.4	32.3
Oregon triton	<i>Fusitriton oregonensis</i>	2.9	9.1	5.1
Pacific cod	<i>Gadus macrocephalus</i>	675.7	266.2	417.2
Pacific glass shrimp	<i>Pasiphaea pacifica</i>	-	5.3	12.0
Pacific hake	<i>Merluccius productus</i>	-	-	223.6
Pacific halibut	<i>Hippoglossus stenolepis</i>	1,376.6	544.7	2,646.1
Pacific herring	<i>Clupea pallasii</i>	-	6.7	38.4
Pacific lyre crab	<i>Hyas lyratus</i>	0.8	1.1	-
Pacific ocean perch	<i>Sebastes alutus</i>	618.9	402.4	4,700.6
Pacific sand lance	<i>Ammodytes hexapterus</i>	-	1.1	-
Pacific sanddab	<i>Citharichthys sordidus</i>	-	-	4.7
Pacific sleeper shark	<i>Somniosus pacificus</i>	-	1,167.9	-
Pacific spiny lumpsucker	<i>Eumicrotremus orbis</i>	1.8	-	-
pandalid shrimp unident.	<i>Pandalidae (family)</i>	-	18.4	-
pandlus shrimp sp.	<i>Pandalus sp.</i>	-	49.1	-
pasiphaeid shrimp unident.	<i>Pasiphaeidae (family)</i>	-	-	37.7
paxillatus sunstar	<i>Solaster paxillatus</i>	-	2.0	-
pearly prickleback	<i>Bryzoichthys marjorius</i>	-	-	6.0
petrale sole	<i>Eopsetta jordani</i>	-	-	62.6
pink salmon	<i>Oncorhynchus gorbuscha</i>	-	-	43.1
Plumose Anemone	<i>Metridium senile</i>	-	-	152.9
poacher unident.	<i>Agonidae</i>	-	-	1.0
polychaete worm unident.	<i>Polychaeta (class)</i>	1.6	-	-
ponderosa brittlestar	<i>Amphiophiura ponderosa (=Ophiura po</i>	-	-	0.6

Table 2 (cont.). Mean catch (kg/km²) in proposed HAPC areas based on NMFS triennial surveys years 1990-1996. HAPC areas are composed of ADF&G statistical areas and include: Kenai 515831,515902; Yakutat 405900; Dixon 335431,325434.

<u>Common name</u>	<u>Latin name</u>	<u>Kenai</u>	<u>Yakutat</u>	<u>Dixon</u>
Pribilof whelk	<i>Neptunea pribiloffensis</i>	-	-	4.3
prickleback unident.	<i>Stichaeidae</i>	-	1.4	-
prowfish	<i>Zaprora silenus</i>	-	108.6	-
pygmy rockfish	<i>Sebastes wilsoni</i>	-	-	4.3
quillback rockfish	<i>Sebastes maliger</i>	-	49.7	122.8
red bat star	<i>Ceramaster japonicus</i>	3.4	-	-
red sea urchin	<i>Strongylocentrotus franciscanus</i>	-	-	44.2
Red tree coral	<i>Primnoa willeyi</i>	3,478.4	-	5,196.0
redbanded rockfish	<i>Sebastes babcocki</i>	-	125.1	602.6
redstripe rockfish	<i>Sebastes proriger</i>	-	-	2,794.7
rex sole	<i>Glyptocephalus zachirus (=Errex zachir</i>	278.4	189.1	393.6
rock sole sp.	<i>Lepidopsetta sp. (=Pleuronectes in par</i>	32.8	-	47.9
rose sea star	<i>Crossaster papposus</i>	1.1	4.2	1.8
rose sea star unid	<i>Crossaster sp.</i>	-	1.7	-
rosethorn rockfish	<i>Sebastes helvomaculatus (=Sebastes r</i>	-	-	139.5
roughey rockfish	<i>Sebastes aleutianus</i>	-	76.9	322.4
roundtip brittlestar	<i>Ophiura sarsi</i>	-	3.9	0.1
sablefish	<i>Anoplopoma fimbria</i>	1,114.6	629.2	513.4
salmon and trouts unident.	<i>Salmonidae</i>	7.6	-	-
salps unident.	<i>Thaliacea unident.</i>	-	-	7.8
Sandstar	<i>Luidia foliata</i>	-	-	2.4
sawback poacher	<i>Sarritor frenatus</i>	3.3	-	-
sculpin unident.	<i>Cottidae</i>	-	-	1.2
sea anemone metridium	<i>Metridium sp.</i>	-	-	34.3
sea anemone unident.	<i>Actiniaria (order)</i>	49.8	1.8	22.4
sea cucumber unident.	<i>Holothuroidea unident.</i>	0.8	35.8	14.0
sea mouse unident.	<i>Aphroditidae</i>	-	3.9	1.3
sea urchin unident.	<i>Echinoids unid.</i>	48.1	153.1	17.1
searcher	<i>Bathymaster signatus</i>	15.3	7.8	-
seastar	<i>Gephyreaster swifti</i>	-	0.5	0.5
seastar family Poraniidae	<i>Poraniopsis inflata</i>	-	-	0.2
seastar Henricia sp.	<i>Henricia sp.</i>	-	1.3	0.9
seastar, Pterasteridae	<i>Diplopteraster multipes</i>	-	-	0.3
sharpchin rockfish	<i>Sebastes zacentrus</i>	-	13.2	4,619.7
shortfin eelpout	<i>Lycodes brevipes</i>	-	-	42.9
shortraker rockfish	<i>Sebastes borealis</i>	-	287.2	491.0
shortspine thornyhead	<i>Sebastolobus alascanus</i>	-	669.2	848.4
shrimp, Lebbeus	<i>Lebbeus groenlandicus</i>	-	-	0.9
sidestripe shrimp	<i>Pandalopsis dispar</i>	-	25.5	47.0
silvergray rockfish	<i>Sebastes brevispinis</i>	105.2	259.5	926.9
sinuous whelk	<i>Buccinum plectrum</i>	-	5.1	-
skate egg case unident.	<i>Rajidae egg case unident.</i>	1.0	-	-
skate unident.	<i>Rajidae unident.</i>	-	-	130.3
slender seawhip	<i>Stylatula sp.</i>	-	-	0.9
slender sole	<i>Lyopsetta exilis</i>	-	9.1	10.9
smooth lumpsucker	<i>Aptocyclus ventricosus</i>	1.7	-	6.4
smootheye poacher	<i>Xeneretmus leiops</i>	-	-	2.2
snail (gastropod) eggs	<i>Gastropod eggs</i>	-	-	2.5
snail unident.	<i>Gastropod unident.</i>	-	1.2	2.8
snailfish unident.	<i>Cyclopteridae (Liparidinae)</i>	-	-	4.5
sockeye salmon	<i>Oncorhynchus nerka</i>	-	6.3	-
southern rock sole	<i>Lepidopsetta bilineata</i>	-	-	223.0
spiny dogfish	<i>Squalus acanthias</i>	-	41.9	65.4
spinyhead sculpin	<i>Dasycottus setiger</i>	-	6.0	-
sponge unident.	<i>Porifera</i>	146.0	117.7	110.0
spot shrimp	<i>Pandalus platyceros</i>	-	4.4	32.4
spotted ratfish	<i>Hydrolagus coliei</i>	-	-	244.2
squid unident.	<i>Cephalopod unid.</i>	-	-	65.2
squid, Gonatus sp.	<i>Gonatus sp.</i>	-	4.6	-
starfish family Astariidae_1	<i>Pteraster militaris</i>	1.1	-	-
starfish family Astariidae_2	<i>Luidiaster dawsoni</i>	1.6	-	-
starfish family Astariidae_3	<i>Luidiaster dawsoni</i>	-	-	0.3

Table 2 (cont.). Mean catch (kg/km²) in proposed HAPC areas based on NMFS triennial surveys years 1990-1996. HAPC areas are composed of ADF&G statistical areas and include: Kenai 515831,515902; Yakutat 405900; Dixon 335431,325434.

<u>Common name</u>	<u>Latin name</u>	<u>Kenai</u>	<u>Yakutat</u>	<u>Dixon</u>
starfish family Asteropectinidae_1	<i>Leptychaster sp.</i>	-	1.3	-
starfish family Asteropectinidae_2	<i>Dipsacaster borealis</i>	-	-	14.1
starfish family Goniastaridae	<i>Pseudarchaster parelii</i>	1.1	1.0	-
starfish unident.	<i>Asteroidea (class)</i>	-	9.7	9.9
Tanner crab (bairdi)	<i>Chionoecetes bairdi</i>	-	4.8	-
tree sponge	<i>Mycale loveni</i>	14.5	-	210.9
triton sp.	<i>Fusitriton sp.</i>	-	2.0	-
twospine crangon	<i>Crangon communis</i>	-	1.1	-
unsorted shab		-	819.2	58.9
viperfish unident.	<i>Chauliodontidae</i>	-	-	1.2
walleye pollock	<i>Theragra chalcogramma</i>	2,253.3	420.7	377.3
wattled eelpout	<i>Lycodes palearis</i>	8.3	23.8	5.7
weathervane scallop	<i>Patinopecten caurinus</i>	-	7.3	-
whelk neptunidae	<i>Neptunea sp.</i>	0.8	-	-
white claypipe sponge		-	-	3.7
white sea urchin	<i>Strongylocentrotus pallidus</i>	-	69.0	-
whiteknee hermit	<i>Pagurus dalli</i>	-	1.2	-
yellow Irish lord	<i>Hemilepidotus jordani</i>	4.6	-	-
yelloweye rockfish	<i>Sebastes ruberrimus</i>	150.3	-	381.4
yellowleg pandalid	<i>Pandalus tridens</i>	-	-	0.5
yellowmouth rockfish	<i>Sebastes reedi</i>	-	-	190.8
yellowtail rockfish	<i>Sebastes flavidus</i>	-	-	232.1

Summary Table 2

	<u>Kenai</u>	<u>Yakutat</u>	<u>Dixon</u>
Sum species richness	66	109	139
Sum biomass	25,319	14,051	34,302