

Alaska Fisheries Science Center  
Resource Ecology & Fisheries Management  
7600 Sand Point Way NE, Bldg. 4  
Seattle, WA 98115  
January 10, 2007

**Cruise Report**  
**F/T Seafisher Cruise**  
**SF200601 (October 11 – November 1, 2006)**

**Project Title: Atka Mackerel Tag Recovery Kiska Island and  
Seguam Pass, Aleutian Islands Alaska**

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**Scientific Purpose**

The first objective of our tag release-recovery studies is to determine the efficacy of trawl exclusion zones as a management tool to maintain prey abundance/availability for Steller sea lions at local scales. Trawl exclusion zones were established around sea lion rookeries as a precautionary measure to protect critical sea lion habitat, including local populations of prey such as Atka mackerel. Localized fishing may affect Atka mackerel abundance and distribution near sea lion rookeries. Tagging experiments are being used to estimate abundance and movement between areas open and closed to the Atka mackerel fishery. A feasibility study was conducted in 1999 at Seguam Pass. In summer 2000, approximately 8000 tagged Atka mackerel were released in Seguam Pass, and in 2001 approximately 1000 were released during a truncated cruise. In June-July 2002, approximately 27,700 fish were tagged in the Seguam Pass area, and approximately 12,800 were tagged near Tanaga Pass. In July 2003 approximately 14,750 fish were tagged and released in the Amchitka Island area. In July of 2006 approximately 7,900 fish were released near the Kiska Island area and 7,200 fish near Seguam Pass area. Recovery of tagged fish is supplied by the fishery in the open area outside the trawl exclusion zone. Recoveries in the closed area are provided by chartered recovery cruises. To compare charter recoveries to fishery recoveries, the charter also provides recovery in the area open to fishing. Our tagging studies to date have focused on Atka mackerel movement and abundance in the presence of a fishery. In addition to the data gathered from the tag and release experiment, biological data such as stomachs, gonad samples, age structures, sexed length frequencies, and catch composition are also collected for each haul during the tag recovery charter.

**Personnel SF200601 (Leg 1, Seguam Pass and Kiska Island: October 11 – 25)**

<u>Name</u>	<u>Sex/Natl.</u>	<u>Position</u>	<u>Organization</u>
1. S.McDermott	F/USA	Field Party Chief	AFSC
2. K. Rand	F/USA	Watch Leader	NPFF
3. A. Billings	F/USA	Fish Biologist	NPFF
4. A. Mitchell	M/USA	Fish Biologist	NPFF
5. J. Aggee	F/USA	Fish Biologist	NPFF
6. S. Romain	F/USA	Fish Biologist	NPFF

**Personnel SF200601 (Leg 2, Seguam Pass, October 26 – November 1)**

<u>Name</u>	<u>Sex/Natl.</u>	<u>Position</u>	<u>Organization</u>
1. P. Munro	M/USA	Field Party Chief	AFSC
2. J. Conner	M/USA	Watch Leader	AFSC
3. A. Billings	F/USA	Fish Biologist	NPFF
4. A. Mitchell	M/USA	Fish Biologist	NPFF
5. J. Aggee	F/USA	Fish Biologist	NPFF
6. S. Romain	F/USA	Fish Biologist	NPFF

AFSC = Alaska Fisheries Science Center

NPFF = North Pacific Fisheries Foundation

**Cruise Schedule and Activities SF200601**

11 Oct.	Board vessel @ 1200, Dutch Harbor, AK
11-12	Transit to Seguam Pass
12-13	Recovery tows, Seguam Pass
13-15	Transit to Kiska Island.
15-19	Recovery tows, Kiska Island
20	Full offload in Kiska Harbor
21-24	Recovery tows, Kiska Island
25	Transit to Adak, AK and partial offload
26 Oct.	Transit to Seguam Pass, begin recovery tows
26-31	Recovery Tows, Seguam Pass
1 Nov.	Transit to Dutch Harbor, AK, offload vessel

## **Summary of Results**

### ***Total Atka mackerel catch by area***

During the years 1999-2002 NMFS released ~ 37,000 tags in Seguam Pass, no fish were tagged and released during 2003 - 2005 and during 2006 NMFS again released ~7,200 tags in each of the 4 strata as shown in Figure 1. Hauls in which tags were recovered are circled in black. In July 2006 ~7,900 fish were tagged and released near Kiska Island only in strata 1 and 2 as shown in Figure 2 and no fish were released in strata 3 and 4. To determine if there was movement between the northern part of the study area (strata 1 and 2) and southern part of the study area (strata 3 and 4), a total of four haul recovery events were conducted in strata 3 and 4. Table 1 shows the distribution of tows among the strata in Seguam Pass and the Kiska Island areas for the 2006 charter. A total of 44 tows were conducted in Seguam Pass and 31 tows near Kiska Island. Table 2 shows the distribution of Atka mackerel catch by strata in each study area. A total of 1006 MT was caught in Seguam Pass and 780 MT at Kiska Island. The total catch of Atka mackerel was 1,786 MT and 332 MT of bycatch (species other than Atka mackerel).

### ***Length-frequency distribution***

Approximately 150 fish were randomly collected, sexed and lengthed per haul in both study areas (summarized in Table 4). Figure 3 illustrates the percent length frequency distributions for Atka mackerel during the 2006 recovery in Seguam Pass. The length-frequency distribution of fish at Seguam Pass was similar for both sexes and unimodal at 40-41 cm. Figure 4 shows the percent length frequency distribution near Kiska Island. The length distribution of fish was unimodal distribution at 37 cm for males and 36 cm for females. There seemed to be a slightly greater proportion of males at Kiska than at Seguam Pass where there was a slightly greater percentage of females. Figure 5 illustrates all length frequencies combined for both Seguam Pass and Kiska Island. During this cruise we recorded length frequencies for males in spawning color separately to identify spawning habitat. It appeared that in October the proportion of males in spawning color was overall small with a unimodal distribution of 39 cm at Seguam Pass. There were very few males in spawning color at the Kiska Island area therefore those data are not shown.

### ***Species Catch Composition***

Although the focus of the tag recovery was to catch Atka mackerel, other species were caught during the hauls in each of the study areas (Table 7). The most abundant bycatch species were Northern rockfish, Pacific cod, Pacific ocean perch and walleye pollock. We also collected Atka mackerel egg masses as part of an ongoing study on Atka mackerel reproductive ecology.

### ***Wild tag recoveries***

A total of 59 wild tags were recovered on the F/V Seafisher research charter, all of which were tagged and released during the 2006 tag release charter. 55 were recovered near Kiska Island and 4 were recovered near the Seguam Pass study area. Tag recoveries are summarized by area and strata in Table 5. 'Wild tagged' fish are fish that have been tagged and released during a tag release cruise as opposed to tagged fish that were seeded into the catch already on board during the tag recovery cruise to obtain the tag reporting rate (see below).

### ***Tag reporting rate***

Reporting rate is defined as the proportion of tagged fish caught by the vessel that are actually found and reported. To determine tag reporting rate, scientists tagged 10 Atka mackerel per haul and distributed them randomly throughout the catch. ‘Seeded tagged fish were appeared identical to wild tagged fish and could only be distinguished by their tag number. This was done for all hauls during the cruise. These “seeded” tagged fish were recovered in the factory by the vessel and scientific crew. The tag reporting rate is summarized in Table 6. Tag reporting rates were approximately 94% for single tagged fish and 100% for double tagged fish.

### ***Biological samples***

Table 4 summarizes the biological samples taken from Atka mackerel during the tag recovery cruise. Gonads, stomachs and otoliths were randomly collected from 10 fish (5 females and 5 males) from almost every tow.

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# Seguam Atka mackerel Tag Recovery 2006

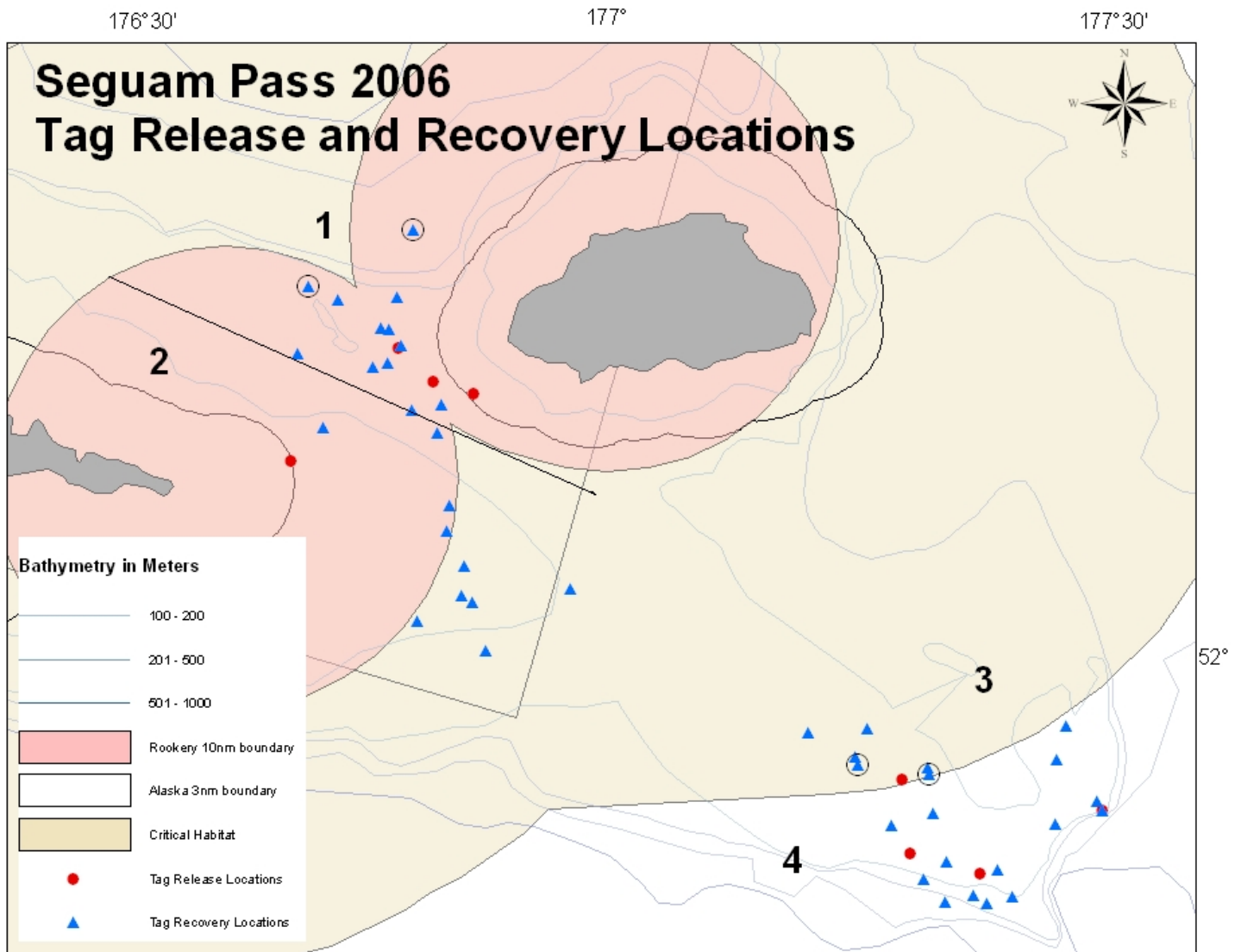


Figure 1. Tag release and recovery haul locations near Seguam Pass. Strata's 1, 2 and 3 are inside the trawl exclusion zone and stratum 4 is outside the trawl exclusion zone. Hauls in which tags were recovered are circled in black.

# Kiska Atka mackerel Tag Recovery 2006

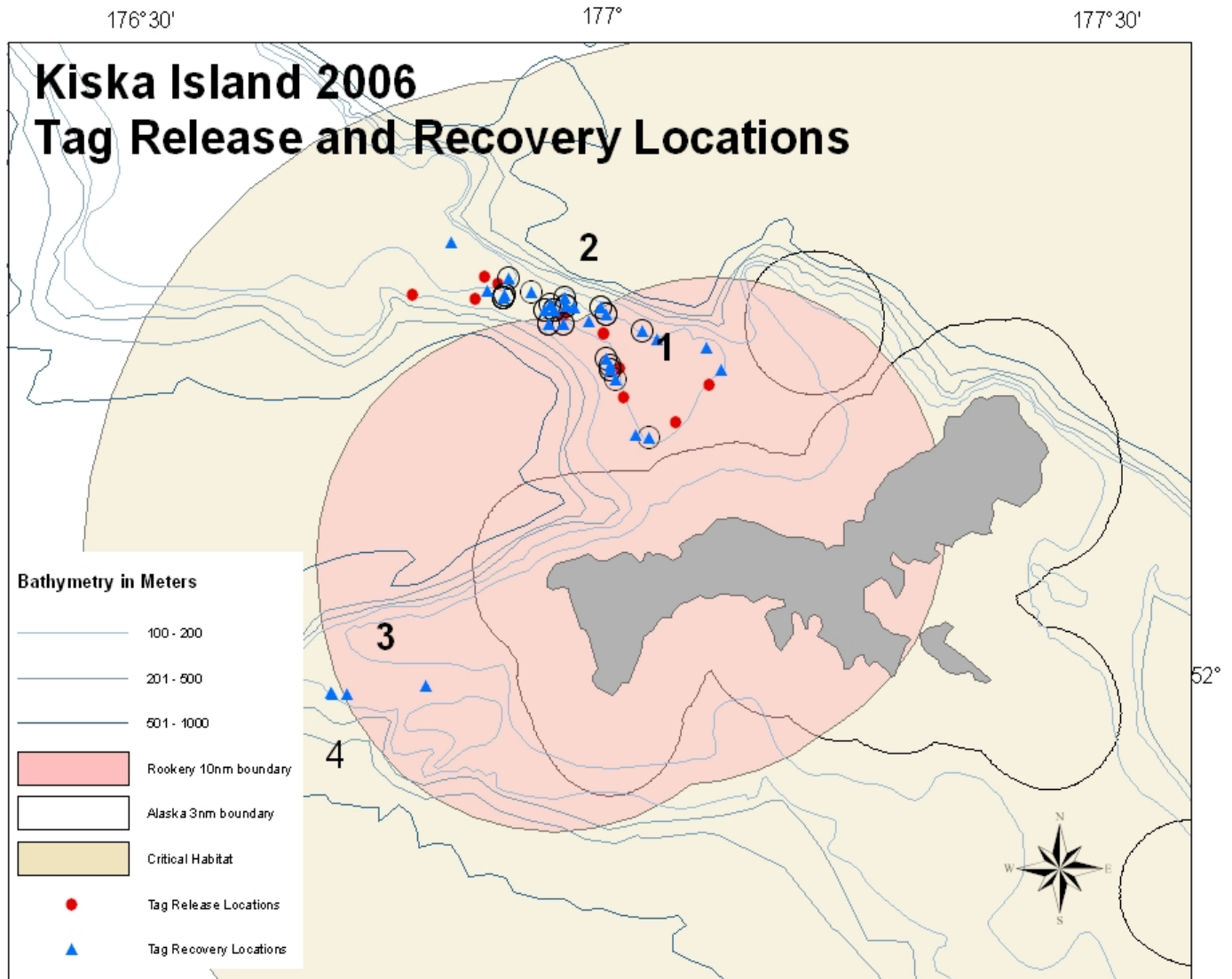


Figure 2. Tag release and recovery haul locations near Kiska Island. Strata 1 and 3 are inside the trawl exclusion zone and strata 2 and 4 are outside the trawl exclusion zone. Hauls in which tags were recovered are circled in black.

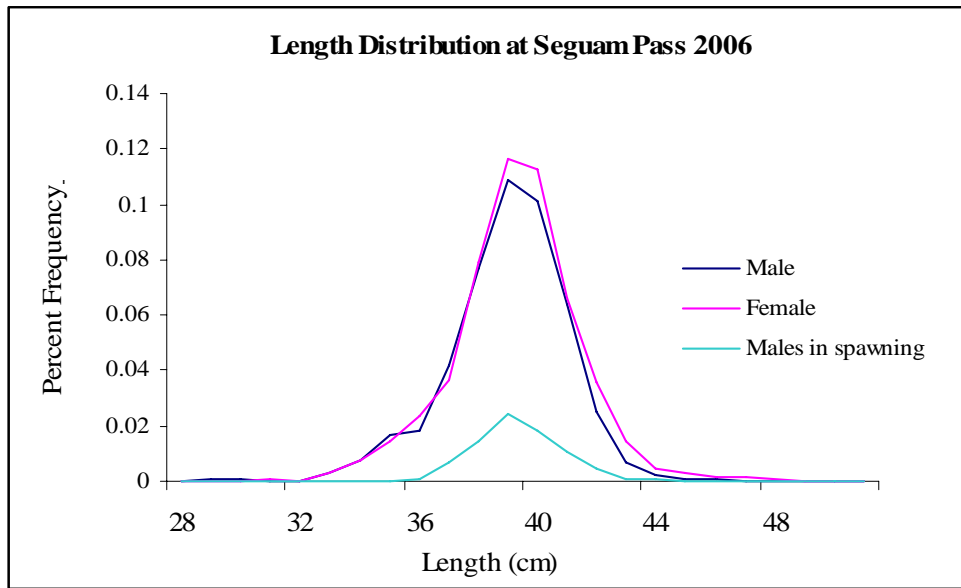


Figure 3: Seguam Pass. Percent length frequency distributions by sex for Atka mackerel during the recovery cruise in 2006. Note that all three categories add up to 100 %.

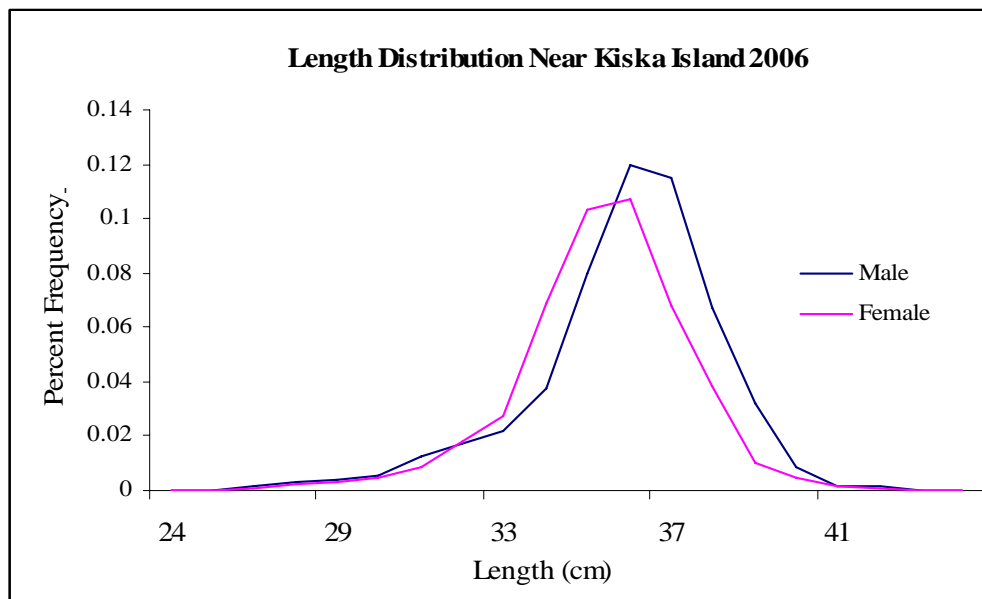


Figure 4: Kiska Island. Percent length frequency distributions by sex for Atka mackerel during the recovery cruise in 2006. Note that all three categories add up to 100 %. There were too few males in spawning color to plot.

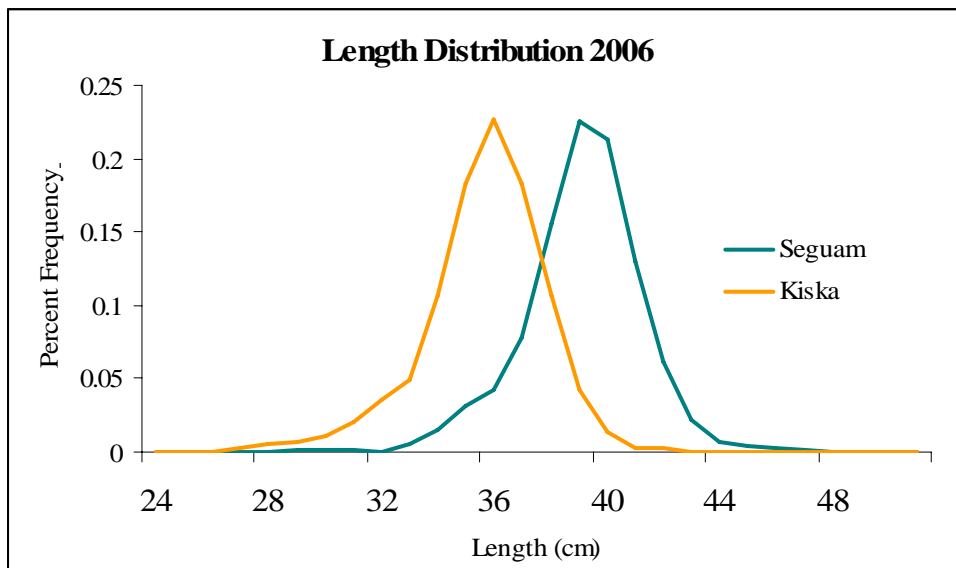


Figure 5: Percent length frequency distributions (combined sexes) by area for Atka mackerel during the recovery cruise in 2006. Note that all three categories add up to 100 %

Table 1. *Number of tows per strata*

<b>Strata</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
Seguam Pass	12	11	7	14
Kiska Island	15	12	2	2

Table 2. *Atka mackerel catch per strata in metric tons*

<b>Strata</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
Seguam Pass	395.55	80.98	162.41	367.13
Kiska Island	389.52	290.39	45.86	55.07



Table 3. *Atka mackerel and bycatch summary per area in metric tons*

<b>Catch in MT</b>	<b>Atka mackerel</b>	<b>Bycatch</b>
Seguam Pass	1006.07	84.34
Kiska Island	780.84	247.84
<b>Total</b>	<b>1786.91</b>	<b>332.18</b>

Table 4. *Total number of biological samples collected*

<b>Samples Collected</b>	<b>Seguam Pass</b>	<b>Kiska Island</b>
Gonads	331	289
Stomachs	331	289
Otoliths	331	289
Lengths	6217	5177

Table 5. *Wild Tag recoveries by strata for each area*

<b>Strata</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
Seguam Pass	1	1	2	0
Kiska Island	24	31	0	0

Table 6. *Tag reporting rate for Seguam Pass and Kiska Island*

<b>Tags</b>	<b>Percent recovered</b>
Single Pink Tag	94%
Double Pink Tag	100%

Table 7. Total catch by species at Seguam Pass and Kiska Island in MT

<b>SpeciesName</b>	<b>Seguam</b>	<b>Kiska</b>
Atka mackerel	1006.06	780.84
Northern rockfish	10.62	159.72
Pacific cod	46.26	53.32
Pacific ocean perch	8.67	23.94
Walleye pollock	1.25	3.58
Sponge unident.	4.19	1.14
Coral unident.	0.10	1.03
Prowfish	0.24	0.82
Alaska skate	1.75	0.79
Northern rock sole	0.79	0.54
Leopard skate	trace	0.53
Darkfin sculpin	0.13	0.47
Basketstarfish unident.	0.12	0.40
Pacific halibut	2.28	0.30
Yellow Irish lord	2.14	0.19
Arrowtooth flounder	0.59	0.16
Rougheye rockfish	trace	0.12
Light dusky rockfish	0.62	0.10
Shortspine thornyhead	trace	0.09
Harlequin rockfish	trace	0.09
Jellyfish unident.	trace	0.06
Starfish unident.	0.16	0.06
Rex sole	trace	0.05
Kamchatka flounder	0.05	0.04
Aleutian skate	trace	0.03
Invertebrate unident.	0.07	0.03
Crab unident.	trace	0.03
Greenland turbot	0.07	0.02
Octopus unident.	0.01	0.02
Unsorted shab	0.01	0.02
Searcher	trace	0.01
Sculpin unident.	0.18	0.01
Black cod	0.24	0.01
Chum salmon	0.35	0.01
Whiteblotched skate	2.00	0.01
Snailfish unident.	trace	0.01
Squid unident.	trace	0.01
Sea urchin unident.	trace	0.01
Shortraker rockfish	trace	0.01
Dark dusky rockfish	trace	0.01
Sharpchin rockfish	trace	0.01
Leister sculpin	trace	0.01
Ronquil unident.	trace	trace
Mud skate	0.03	trace
Sea anemone unident.	0.03	trace
Shrimp unident.	trace	trace
Sea potato	trace	trace

Nudibranch unident.	trace	trace
Snail unident.	trace	trace
Alaskan ronquil	trace	trace
Salmon and trouts unident	trace	trace
Barnacle unident.	trace	trace
Red Irish lord	trace	trace
Solaster sp.	trace	trace
Irish lord	trace	trace
Sea Urchin	trace	trace
Helmet crab	trace	trace
Sand dollar unident.	trace	trace
Poacher unident.	trace	trace
Deepsea skate	0.37	
Bigmouth sculpin	0.30	
Pacific sleeper shark	0.25	
Great sculpin	0.19	
Bering skate	0.04	
Fish unident.	0.03	
Lepidopsetta polyxstra	0.02	
Atka Eggs	0.02	
Pacific spiny lumpsucker	0.01	
Sponge sculpin	0.01	
Broadwing sculpin	trace	
Longfin sculpin	trace	
Southern rock sole	trace	
Redstripe rockfish	trace	
Brown Irish lord	trace	
Longfin Irish lord	trace	
orange-pink sea urchin	trace	
snail (gastropod) eggs	trace	
egg mass, fish, unidentified	trace	