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Cruise Report
F/V Pacific Explorer Cruise 200601
July 8 - July 21, 2006

**Project Title: Atka mackerel tag and release, Kiska and Seguam
Islands, Aleutian Islands, Alaska**

SCIENTIFIC PURPOSE

The objective of our on-going 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 the years 2000 to 2002 approximately 30,000 tagged Atka mackerel were released in the Seguam Island area. In 2002 approximately 15,000 tags were released in the Tanaga Island area. In 2003 approximately 15,000 tagged fish were released around Amchitka Island. Recovery of tagged fish is supplied by the fishery in the open areas outside trawl exclusion zones. Recoveries in the trawl exclusion zones are provided by chartered recovery cruises. The purpose of F/V Pacific Explorer Cruise 200601 was to tag and release Atka mackerel inside and outside the trawl exclusion zones near Kiska and Seguam Islands (Figures 1 and 2). Approximately 8,000 fish were tagged and released during this cruise at Kiska Island and 7,200 fish were tagged and release at Seguam Island.

ITINERARY AND ACTIVITIES

July	5-8	Dutch Harbor, AK; load gear, set up tanks, begin transit at midnight.
	8-10	In transit to Kiska Island area
	11	Kiska Island, tagging in stratum 2 (see Figure 1)
	12	Kiska Island, tagging in strata 1, 2
	13	Kiska Island, tagging in stratum 1
	14	Kiska Island, tagging in strata 1, 2
	15-16	In transit to Seguam Island.
	17	Seguam Island, tagging in stratum 1
	18	Seguam Island, tagging in strata 2, 4
	19	Seguam Island, tagging in strata 3, 4
	20	Seguam Island, tagging in stratum 4
	20-21	In transit to Dutch Harbor, clean tanks, nets and gear
	21	Dutch Harbor, AK, unload tanks, nets and gear

RESULTS

Tagged Atka mackerel.

Table 1 shows the number of Atka mackerel tagged and released in each stratum in the Kiska Island area. Strata locations and trawl tows where Atka mackerel were caught are shown in Figure 1. Table 2 shows the number of Atka mackerel tagged and released in each stratum in the Seguam Island area. Strata locations and trawl tows are shown in Figure 2.

Table 1. Distribution of tagged fish near Kiska Island by stratum.

Stratum	# Tagged fish released
1	4,127
2	3,854
3	No Tags
4	No Tags
Total	7,981

Table 2. Distribution of tagged fish near Seguam Island by stratum

Stratum	# Tagged fish released
1	1,937
2	1,060
3	1,120
4	3,155
Total	7,272

Haul Locations and depths.

Table 3 shows the latitude, longitude and depth of all trawl tows where Atka mackerel were caught at Kiska Island (with the exception of haul 2, which caught only rockfish). Table 4 shows the tows at Seguam Island (no Atka mackerel were caught during haul 14, due to a hole in the codend).

Table 3. Tag release locations near Kiska Island. Latitude and longitude are in decimal degrees and depth is in meters.

Haul	Area	Starting Latitude	Starting Longitude	Starting Depth (m)	Ending Latitude	Ending Longitude	Ending Depth (m)
1	Kiska	52.05	177.0333	107.8	52.03333	177	97.4
2	Kiska	52.01667	176.9333	118.5	52.01667	176.9333	117.4
3	Kiska	52.05	176.9833	94	52.05	177	98.3
4	Kiska	52.05	177.0667	106.9	52.05	177.1	106.9
5	Kiska	52.03333	177.1167	102.2	52.05	177.15	93.4
6	Kiska	52.86667	177.1667	93.6	52.03333	177.1833	95.8
7	Kiska	52.01667	177.1833	97.4	52.01667	177.2	93.4
8	Kiska	51.98333	177.2167	96.1	52.01667	177.2667	87.2
9	Kiska	52.01667	177.2667	89.4	52.05	177.2833	88.1
10	Kiska	52.03333	177.1667	91.8	52.05	177.15	102.4
11	Kiska	52.03333	176.9667	93.4	52.05	177.0167	92.3

Table 4. Tag release locations near Seguam Island. Latitude and longitude are in decimal degrees and depth is in meters.

Haul	Area	Starting Latitude	Starting Longitude	Starting Depth (m)	Ending Latitude	Ending Longitude	Ending Depth (m)
12	Seguam	52.23333	-172.767	135	52.23333	-172.75	134.9
13	Seguam	52.25	-172.683	139.9	52.21667	-172.7	163.3
14	Seguam	52.21667	-172.7	164.5	52.21667	-172.65	174.2
15	Seguam	52.13333	-172.833	120.7	52.13333	-172.833	112.4
16	Seguam	51.98333	-172.033	124.9	51.98333	-172.017	128
17	Seguam	52.05	-172.1	114.6	52.03333	-172.05	126.1
18	Seguam	51.98333	-171.933	126.3	51.98333	-171.933	128.7
19	Seguam	52.06667	-171.817	123.2	52.05	-171.817	128.1

Biological samples

Otoliths, gonads and stomachs were collected from 5 males and 5 females from every successful haul. In addition, gonad maturity state was assessed visually and male color code was recorded (1: Males same color as females, 2: Males yellow, but not in full nest guarding coloration, 3: Males in full nest guarding coloration.). Samples were taken from a total of 149 fish.

Length frequency

In order to examine any bias in the length selection of the tagged fish, it is necessary to obtain length frequencies from the total catch. Approximately 100 fish (not tagged) were sacrificed from each haul to determine sex and length for a total of 1,168 fish.

Maturity

The gonads of fish collected for length frequency data were visually inspected and categorized into maturity stages. Approximately 1,168 fish were recorded as one of six stages of females or four stages of males. In addition, color code was recorded for all males.

Mortality study

For each haul 10 randomly selected fish were placed into tanks to assess mortality rate following capture, handling and tagging. Experiments were conducted where fish were kept for at least 48 hours. Nine experiments were conducted over the course of the cruise. Of the 118 fish participating in the experiments, a total of 3 died, for a mortality rate of 2.5%.

Physical oceanographic measurements

Continuous temperature and salinity data were collected with a Seabird SBE45 plumbed to receive water from the same source as the live tanks. Fluorescence was measured

continuously with a Turner Designs SCUFA fluorometer. Water samples were filtered and the filtrate frozen for chlorophyll analysis upon return to the laboratory. Water samples were also frozen for nutrient analysis. Temperature-depth data were collected with a microbathythermograph (MBT) mounted on the net.

Zooplankton tows

A 505 micron-mesh ring net was deployed vertically off the stern after the Atka mackerel tagging tows. A total of 14 successful zooplankton tows were conducted. Invertebrates such as copepods, amphipods, small jellyfish and a few euphausiids were collected and preserved for analysis in the laboratory.

Special projects

A number of additional specimens were collected at the request of other scientists. Atka mackerel morphological measurements were made to determine if sex can be differentiated by non-lethal means, to determine if males in nest guarding coloration have different morphometrics than males not in nest guarding coloration, and to determine if mature and immature males have different morphometrics. A total of 34 males and 30 females were measured for this special project. Three yellow Irish lords (*Hemilepidotus jordani*) were collected for comparative fish skeletons to use in studies of fish bones from coastal archaeological sites in the Aleutian Islands. Twenty-one Pacific cod stomachs were collected and preserved for food habits analysis.

Figure 1. Tag release locations near Kiska Island. Green points are beginning haul positions (EQ) and red points are ending haul positions (HB).

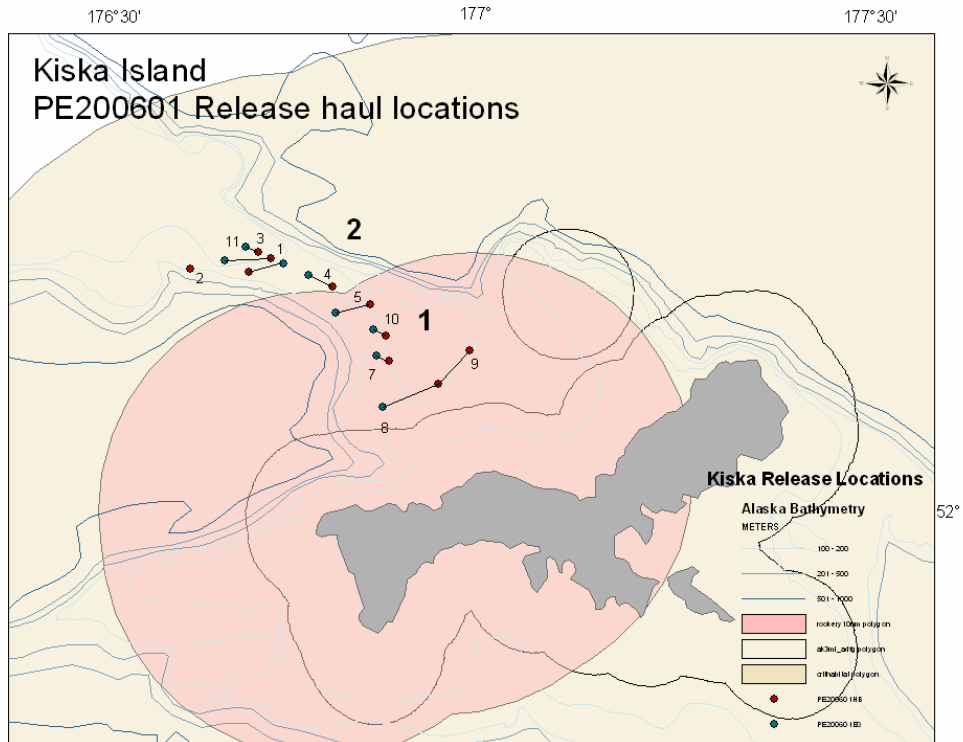
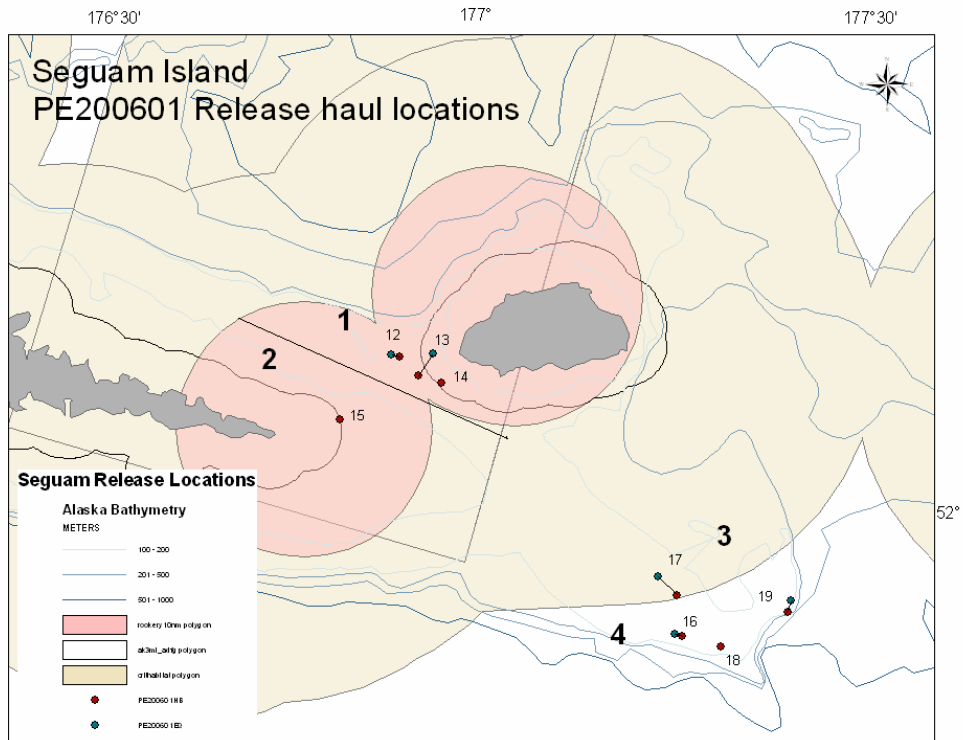


Figure 2. Tag release locations near Seguam Island. Green points are beginning haul positions (EQ) and red points are ending haul positions (HB).



SCIENTIFIC STAFF

<u>Name</u>	<u>Sex/Natl.</u>	<u>Position</u>
1. Elizabeth Logerwell	F/USA	Field Party Chief
2. Daniel Cooper	M/USA	Deck Boss
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