

## Southeast Alaska Coastal Monitoring (SECM)

JC-01-18 Cruise Report

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Prepared by

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Scientists from the Auke Bay Laboratory of the National Marine Fisheries Service, Alaska Fisheries Science Center conducted a 7-d cruise aboard the NOAA ship *John N. Cobb* in the marine waters of the northern region of southeastern Alaska from 26 September - 02 October 2001. This cruise is the fifth in a series of five cruises scheduled for monitoring the inside and coastal marine waters of the region between late spring and early fall of 2001, and was part of the Southeast Alaska Coastal Monitoring (SECM) Project. The SECM project was initiated in 1997 to study the habitat use and early marine ecology of juvenile Pacific salmon (*Oncorhynchus* spp) in inshore, strait, and coastal habitats along a primary seaward migration corridor used by juvenile salmon. Objectives for the monitoring cruises were to: 1) collect biological data on juvenile Pacific salmon and other pelagic fish species from surface rope trawl samples; 2) monitor biophysical oceanographic indices seasonally at sampling stations in inside, strait, and offshore habitats of juvenile salmon; and 3) conduct process studies focusing on bioenergetics of juvenile salmon.

Sampling in 2001 marks the fifth year of a long-term study on how the intra- and inter-annual variability of biophysical oceanographic indices relate to the distribution, abundance, growth, and survival of salmon and other fish populations at the same localities. The information will also provide insight into potential effects of climate change on stock-specific growth and recruitment of salmonids and the utilization of marine habitat by key fish species.

### **METHODS**

Thirteen stations were scheduled for sampling during this cruise, traversing inside waters near Juneau along a 250 km westerly migration corridor within the northern region of southeastern Alaska to 65 km offshore in the Gulf of Alaska (Figure 1; Table 1). Oceanographic measurements and surface trawl sampling were planned for all stations, as time and weather permitted.

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<sup>1</sup>Scientists onboard NOAA Ship *John N. Cobb*

### Oceanographic sampling:

The biophysical environment was monitored at each station and throughout the cruise. To examine horizontal water structure, temperature and salinity readings from a depth of 2-m were continuously logged at one-minute intervals throughout the cruise with a SeaBird SBE-21<sup>2</sup> thermosalinograph mounted on the vessel. To examine vertical water structure, a SeaBird SBE-19 conductivity-temperature-depth (CTD) profiler was deployed at each station, as depth permitted, to 200 m or within 10 m of the bottom. Surface water samples were taken at each station for later determination of chlorophyll and nutrient content. Plankton was sampled at each station with conical and bongo nets. The conical nets were towed vertically and a bongo net was towed obliquely. At each station, vertical plankton tows were made from a depth of 20 m with a 50-cm frame and 243 micron mesh (Norpac) net. In Auke Bay and in the coastal transect only, a 57-cm frame and a 202 micron mesh (WP2) net was used to 200 m or within 20 m of the bottom. A Roshiga flow meter was used inside the 57-cm frame deep conical net to determine the amount of water volume sampled. Also at each station, one double oblique bongo tow was done to 200 m or within 20 m of the bottom using a 60-cm frame with 505 and 333 micron mesh nets. General Oceanics flow meters were placed inside each of the bongo nets to determine the amount of water volume sampled. A Bendix/Marine Advisors Model T-1 Bathykymograph time depth recorder was used with the bongo nets to validate the maximum deployment depth of each tow. Neuston net samples (mouth opening 1 m<sup>2</sup>, 505 µm mesh) were scheduled to be collected at the 0400 and 2200 time intervals at the ISC station. These 10 minute tows were accomplished using the oceanographic winch along the port side of the vessel during fishing operations. These ancillary samples were preserved for Won Park, a University of Alaska, Juneau Center for Fisheries and Ocean Science doctoral student collaborating in SECM zooplankton studies.

### Trawl gear:

Fish sampling was conducted with a Nordic 264 rope trawl fished directly astern the NOAA ship *John N. Cobb* at the surface. Trawl sampling was planned for each station with the exception of Auke Bay Monitor, which was not attempted due to shallow depths. The mouth opening of the trawl was approximately 20 m deep and 24 m wide spread by a pair of 3.0 m Lite trawl doors. The trawl was fished fully open with 150 m of main warp out for a duration of 20 min at a speed of about 1.0-1.5 m/sec (2-3 knots). To fish the headrope of the trawl at the surface, a cluster of three meshed A-4 Polyform buoys was tethered to each wing tip of the headrope and one A-3 Polyform float was clipped onto the center of the headrope. Mesh sizes ranged from 162.6 cm in the throat of the trawl near the jib lines to 8.9 cm in the cod end. A 6.1 m long 0.8 cm knotless liner was sewn into the codend. Along the jib lines on the top panel of the trawl, between the head rope and the first 162.6 cm mesh, a small mesh panel of 10.2 cm mesh was incorporated to minimize the loss of fish aft of the headrope.

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<sup>2</sup>Reference to trade names does not imply endorsement by the National Marine Fisheries Service.

### Fish Processing:

After each haul, the fish were anesthetized, identified, enumerated, measured, and stomachs sampled (if appropriate). Tricaine methanesulfonate was used to anesthetize the fish. Fish were measured to the nearest mm fork length (FL) with a Limnotera FMB IV electronic measuring board. All captured salmon were visually examined the absence of an adipose fin, indicating the potential presence of an internal planted coded-wire tag (CWT). Stomachs from potential predators of juvenile salmon were excised, weighed, and classified by fullness. Stomach contents were then removed, generally identified to the family level, and quantified to the nearest 10% of total volume. The weight of the stomach contents was determined as the difference between the weight of the stomach and contents minus the weight of the empty stomach.

### Laboratory processing:

Data from biological samples processed in the laboratory include: settled volumes of zooplankton from the 20-m vertical hauls and information derived from CWTs recovered from the heads of salmon lacking the adipose fin. Each sample of plankton was settled for a 24 hr period in an Imhof 1000 ml cone to determine the volume of zooplankton at each station. Volumes of settled zooplankton and phytoplankton were recorded to the nearest ml, when possible. CWTs were removed from heads of salmon lacking the adipose fin and decoded to determine the release data of the fish. CWT codes were verified by an independent tag reader. Release data for the CWT codes were obtained from regional mark coordinators, the Pacific States Marine Fisheries Commission ([http://www.psmfc.org/rmpc/cwt\\_reports.html](http://www.psmfc.org/rmpc/cwt_reports.html)), the Alaska Department of Fish and Game (<http://tagotoweb.adfg.state.ak.us>), or the National Marine Fisheries Service, Auke Bay Laboratory.

## ***RESULTS and DISCUSSION***

Sampling was accomplished at 9 of the 13 stations; stations along the Icy Point transect were not sampled due to inclement weather. The diel sampling was successfully conducted at the Icy Strait station ISC, where unexpectedly high catches of non-salmonids occurred. Consequently, the gastric evacuation experiment was not done due to limited scientific personnel and large catches. Towards the end of the cruise, some adaptive sampling was employed to increase sample sizes of the juvenile salmon; this entailed extending the fishing period on the last eight hauls from 20 to 40 minutes.

Oceanographic sampling and surface trawling were conducted according to the following schedule: day one, standard Auke Bay and Upper Chatham Strait transect; day 2, standard Icy Strait transect; day 3, first half of diel samples and one Icy Strait replicate sample; day 4, second half of diel at Icy Strait and two Icy Strait station replicate samples; day 5, Sampling north two stations in Icy Strait twice each for 40 minute hauls; day 6, replicate all four stations at Chatham Strait with 40 minute hauls; day 7, transit to Juneau NMFS subport.

A total of 28 CTD casts, 30 vertical 20-m tows, 21 bongo tows, 1 deep vertical tow, and 27 rope trawl hauls were made during the cruise (Table 2). Nine water samples were also taken for later analysis of chlorophyll and nutrients. Surface (2-m) temperatures and salinities during the cruise ranged from 8.8-9.5 °C and 23.0-28.9 PSU (Table 3). Zooplankton biomass, as determined from the settled volumes from the 20-m vertical tows, ranged from 1-15 ml at the stations, with the highest level occurring during the late night period (0400) during the diel sampling.

A total of 29,391 fish and squid from 15 taxa were captured in the 27 rope trawl hauls, including all five species of Pacific salmon (Tables 3- 5). Ninety-two percent of the catch was comprised of age 1+ walleye pollock (*Theragra chalcogramma*) and 3% (944) was juvenile salmon. However, the frequency of occurrence was highest for pink salmon (*O. gorbuscha*), sockeye salmon (*O. nerka*), and soft sculpin (*Psychrolutes sigalutes*), which were found in 23 of the 27 hauls (Table 5). Juvenile salmon were caught in every trawl.

The diel sampling conducted at station ISC included nine hauls fished during seven time intervals over a 2-3 day period (Table 6). Juvenile salmon catches were generally highest in the morning and afternoon sampling, whereas, walleye pollock and eulachon (*Thaleichthys pacificus*) were exceedingly abundant in the evening and late night periods. Light was lowest and zooplankton levels were highest at the 0400 time period.

Stomach analyses were as performed on board the vessel on 14 potential predators of juvenile salmon: nine adult walleye pollock, four immature chinook salmon (*O. tshawytscha*), and one adult coho salmon (*O. kisutch*) (Table 7). The salmon were generally piscivorous, and no invertebrate prey were observed in their stomachs, whereas walleye pollock consumed no fish prey. The three chinook salmon with food in their stomachs consumed capelin (*Mallotus villosus*) or walleye pollock juveniles, whereas the single coho salmon examined had consumed juvenile salmon. For walleye pollock, euphausiids and shrimp were the most common invertebrate prey, and three of the nine stomachs were empty.

Eight juvenile and immature salmon lacking adipose fins were examined for the presence of coded-wire tags (CWTs) (Table 8); four chinook and two coho salmon contained CWTs. All of the CWT fish were juveniles originating from hatcheries in southeastern Alaska. The apparent daily migration rates of the juvenile salmon ranged from 0.6-0.8 km/d for chinook salmon and from 0.5-1.1 km/d for coho salmon.

#### **ACKNOWLEDGMENTS**

We would like to acknowledge the command and crew of the NOAA ship *John N. Cobb* for their superb cooperation and performance during the cruise.

Table 1.--Localities and coordinates of stations scheduled for sampling in the marine waters of the northern region of southeastern Alaska using the NOAA ship *John N. Cobb*, 26 September - 01 October 2001.

Locality	Station	Latitude north	Longitude west	Distance		Depth m
				offshore km	between km	
Auke Bay	ABM	58° 22.00'	134° 40.00'	1.5	—	60
Upper Chatham Strait	UCA	58° 04.57'	135° 00.08'	3.2	—	400
	UCB	58° 06.22'	135° 00.91'	6.4	3.2	100
	UCC	58° 07.95'	135° 01.69'	6.4	3.2	100
	UCD	58° 09.64'	135° 02.52'	3.2	3.2	200
Icy Strait	ISA	58° 13.25'	135° 31.76'	3.2	—	128
	ISB	58° 14.22'	135° 29.26'	6.4	3.2	200
	ISC	58° 15.28'	135° 26.65'	6.4	3.2	200
	ISD	58° 16.38'	135° 23.98'	3.2	3.2	234
Icy Point	IPA	58° 20.12'	137°07.16'	6.9	—	160
	IPB	58° 12.71'	137°16.96'	23.4	16.8	130
	IPC	58° 05.28'	137°26.75'	40.2	16.8	150
	IPD	57° 53.50'	137°42.60'	65.0	24.8	1,300

Table 2.--Oceanographic and biological samples collected in the marine waters of the northern region of southeastern Alaska using the NOAA ship *John N. Cobb*, 26 September - 01 October 2001.

Date	Time	Haul#	Station	CTD	Plankton net samples			Chlorophyll & nutrients	Rope trawl
					Norpac	Bongo	WP-2		
26 Sept.	1012	5093	ABM	1	3	2	1	1	0
26 Sept.	1334	5094	UCD	1	1	2	0	1	1
26 Sept.	1500	5095	UCC	1	1	2	0	1	1
26 Sept.	1633	5096	UCB	1	1	2	0	1	1
26 Sept.	1814	5097	UCA	1	1	2	0	1	1
27 Sept.	0737	5098	ISA	1	1	4	0	1	1
27 Sept.	0918	5099	ISB	1	1	4	0	1	1
27 Sept.	1105	5100	ISC	1	1	4	0	1	1
27 Sept.	1407	5101	ISD	1	1	4	0	1	1
28 Sept.	0409	5102	ISC	1	1	2	0	0	1
28 Sept.	0702	5103	ISC	1	1	2	0	0	1
28 Sept.	0946	5104	ISC	1	1	2	0	0	1
28 Sept.	1303	5105	ISC	1	1	2	0	0	1
28 Sept.	1103	5106	ISD	1	1	0	0	0	1
29 Sept.	1338	5107	ISC	1	1	2	0	0	1
29 Sept.	1551	5108	ISC	1	1	2	0	0	1
29 Sept.	1841	5109	ISC	1	1	2	0	0	1
29 Sept.	2143	5110	ISC	1	1	2	0	0	1
29 Sept.	1010	5111	ISA	1	1	0	0	0	1
29 Sept.	1123	5112	ISB	1	1	0	0	0	1
30 Sept.	0952	5113	ISD	1	1	0	0	0	1
30 Sept.	1218	5114	ISC	1	1	0	0	0	1
30 Sept.	1402	5115	ISD	1	1	0	0	0	1
30 Sept.	1540	5116	ISC	1	1	0	0	0	1
01 Oct.	0728	5117	UCA	1	1	0	0	0	1
01 Oct..	0901	5118	UCB	1	1	0	0	0	1
01 Oct..	1031	5119	UCC	1	1	0	0	0	1
01 Oct.	1253	5120	UCD	1	1	0	0	0	1
Total				28	30	42	1	9	27

Table 3.--Two meter depth temperatures and salinities, settled volumes of plankton from 20-m vertical Norpac hauls, and catches of salmon with a rope trawl at stations sampled from the NOAA ship *John N. Cobb* in marine waters of the northern region of southeastern Alaska, 26 September - 01 October 2001.

Date	Haul#	Station	Temp. (°C)	Salinity (PSU)	Settled plankton (ml)			Juvenile salmon					Immature	Adult
					Zoop-	Phyto-	Total	Pink	Chum	Sockeye	Coho	Chinook	Chinook	Coho
26 Sept.	5093	ABM	9.3	23.0	7.3	54.0	62.0	—	—	—	—	—	—	—
26 Sept.	5094	UCD	9.4	27.4	1.0	0.0	1.0	2	1	2	0	1	0	0
26 Sept.	5095	UCC	9.4	27.8	1.0	0.0	1.0	1	0	2	0	0	0	0
26 Sept.	5096	UCB	9.5	28.1	2.0	0.0	2.0	1	0	0	0	0	0	0
26 Sept.	5097	UCA	9.0	28.9	1.0	0.0	1.0	6	0	1	1	0	0	0
27 Sept.	5098	ISA	8.8	28.5	2.0	0.0	2.0	12	1	1	2	3	0	0
27 Sept.	5099	ISB	9.0	28.1	2.0	0.0	2.0	4	1	4	1	1	1	0
27 Sept.	5100	ISC	9.1	28.3	2.0	0.0	2.0	4	1	3	0	0	0	0
27 Sept.	5101	ISD	9.2	27.9	2.0	0.0	2.0	4	2	6	0	0	0	0
28 Sept.	5102	ISC	9.2	27.3	15.0	0.0	15.0	6	0	2	1	1	0	0
28 Sept.	5103	ISC	9.2	27.4	1.0	0.0	1.0	9	1	4	0	8	0	0
28 Sept.	5104	ISC	9.3	27.6	2.0	0.0	2.0	24	3	3	0	1	0	0
28 Sept.	5105	ISC	9.4	27.4	1.0	0.0	1.0	3	2	1	0	1	0	0
28 Sept.	5106	ISD	9.4	26.9	2.0	18.0	20.0	4	2	2	0	1	0	0
29 Sept.	5107	ISC	9.4	26.1	2.0	14.0	16.0	0	6	1	0	0	0	0
29 Sept.	5108	ISC	9.4	25.1	2.0	13.0	15.0	0	1	0	0	1	0	0
29 Sept.	5109	ISC	9.2	25.9	3.0	27.0	30.0	38	4	2	0	2	2	0
29 Sept.	5110	ISC	9.2	25.9	5.0	45.0	50.0	79	6	9	1	3	0	0
29 Sept.	5111	ISA	8.8	28.6	3.0	0.0	3.0	28	2	0	0	0	0	0
29 Sept.	5112	ISB	9.1	27.7	3.0	0.0	3.0	0	0	2	0	0	0	0
30 Sept.	5113	ISD	9.2	24.7	5.0	60.0	65.0	19	5	5	0	1	0	0
30 Sept.	5114	ISC	9.2	24.6	3.0	22.0	25.0	16	4	6	0	0	0	0
30 Sept.	5115	ISD	9.3	24.7	5.0	40.0	45.0	32	4	4	0	2	0	0
30 Sept.	5116	ISC	9.3	24.7	5.0	30.0	35.0	77	23	10	3	1	0	0
01 Oct.	5117	UCA	9.1	25.7	2.0	0.0	2.0	70	18	20	4	8	0	0
01 Oct..	5118	UCB	9.1	24.8	1.0	0.0	1.0	200	18	37	5	7	0	0
01 Oct..	5119	UCC	9.2	23.3	2.0	0.0	2.0	5	0	2	0	0	1	0
01 Oct.	5120	UCD	9.1	24.8	2.0	0.0	2.0	0	0	0	1	0	0	1
Total catch			—	—	—	—	—	644	105	129	19	42	4	1

Table 4.--Catches of fish other than salmon with a rope trawl at stations sampled from the NOAA ship *John N. Cobb* in marine waters of the northern region of southeastern Alaska, 25 September - 01 October 2000.

Date	Haul#	Station	Soft sculpin	Pacific herring	Squid	Crested sculpin	Walleye pollock	Capelin	Sturgeon poacher	Smooth lump sucker	Pacific spiny lump sucker	Eulachon	Smelt
26 Sept.	5093	ABM	—	—	—	—	—	—	—	—	—	—	—
26 Sept.	5094	UCD	1	0	0	0	0	0	0	0	0	0	0
26 Sept.	5095	UCC	8	0	0	1	0	0	0	0	0	0	0
26 Sept.	5096	UCB	11	0	0	3	0	0	0	0	0	0	0
26 Sept.	5097	UCA	53	0	6	1	1	34	0	0	0	0	0
27 Sept.	5098	ISA	47	0	0	1	0	3	0	0	0	0	0
27 Sept.	5099	ISB	22	0	0	0	0	0	0	0	0	0	0
27 Sept.	5100	ISC	4	0	0	0	0	0	0	0	0	0	0
27 Sept.	5101	ISD	6	0	0	0	0	0	0	0	0	0	0
28 Sept.	5102	ISC	0	5	0	0	7,999	0	0	0	0	142	0
28 Sept.	5103	ISC	338	0	1	0	0	0	0	0	0	1	17
28 Sept.	5104	ISC	30	0	0	0	2	0	0	0	1	0	3
28 Sept.	5105	ISC	15	0	0	0	0	0	1	0	0	0	0
28 Sept.	5106	ISD	23	0	0	0	2	0	1	0	0	0	0
29 Sept.	5107	ISC	21	0	0	0	0	0	0	0	0	0	0
29 Sept.	5108	ISC	1	0	0	0	0	0	0	0	0	0	0
29 Sept.	5109	ISC	0	0	0	0	11,607	0	0	0	0	1	0
29 Sept.	5110	ISC	0	2	1	1	7,505	20	0	0	0	164	0
29 Sept.	5111	ISA	6	0	0	0	1	0	0	0	0	0	0
29 Sept.	5112	ISB	180	0	0	0	0	0	0	0	0	0	0
30 Sept.	5113	ISD	58	5	0	0	1	0	0	1	0	0	0
30 Sept.	5114	ISC	27	0	1	0	1	0	0	1	0	0	0
30 Sept.	5115	ISD	3	0	0	1	0	0	0	0	0	0	1
30 Sept.	5116	ISC	0	2	0	0	0	0	0	0	1	0	0
01 Oct.	5117	UCA	1	1	0	0	0	0	0	0	0	0	0
01 Oct.	5118	UCB	3	0	0	0	2	0	0	0	0	0	0
01 Oct.	5119	UCC	39	0	0	0	0	0	0	0	0	0	0
01 Oct.	5120	UCD	5	0	0	0	0	0	0	0	0	0	0
Total catch			902	15	9	8	27,121	57	2	2	2	308	21

Table 5.--Length, frequency of occurrence, and life history stage of fish captured with 27 rope trawl hauls in the marine waters of the northern region of southeastern Alaska using the NOAA ship *John N. Cobb*, 26 September - 01 October 2001.

Common name	Species	n	Fork length (mm)			Frequency of occurrence	Life <sup>3</sup> history stage
			min	max	$\bar{x}$		
Pink salmon	<i>Oncorhynchus gorbuscha</i>	644	140	245	202.7	23	J
Sockeye salmon	<i>O. nerka</i>	129	111	252	177.8	23	J
Chum salmon	<i>O. keta</i>	105	143	240	201.3	20	J
Chinook salmon	<i>O. tshawytscha</i>	42	186	313	255.2	16	J
Coho salmon	<i>O. kisutch</i>	19	226	284	258.7	9	J
Chinook salmon	<i>O. tshawytscha</i>	4	393	464	433.0	3	I
Coho salmon	<i>O. kisutch</i>	1	663	663	663.0	1	A
Total salmonids captured and measured		944	—	—	—	—	—
Soft sculpin <sup>4</sup>	<i>Psychrolutes sigalutes</i>	902	15	46	31.6	23	J-A
Pacific herring	<i>Clupea pallasii</i>	15	133	221	169.3	5	I-A
Squid	Gonatidae	9	30	77	42.0	4	I
Crested sculpin	<i>Blepsias bilobus</i>	8	139	168	150.9	6	I-A
Walleye pollock <sup>3</sup>	<i>Theragra chalcogramma</i>	27,121	89	530	223.9	10	J-A
Capelin <sup>3</sup>	<i>Mallotus villosus</i>	57	41	59	51.5	3	J
Sturgeon Poacher	<i>Agonus acipenserinus</i>	2	191	214	202.5	2	A
Smooth lump sucker	<i>Aptocyclus ventricosus</i>	2	150	170	160.0	2	A
P. Spiny lump sucker	<i>Eumicrotremus orbis</i>	2	81	81	81.0	2	I
Eulachon <sup>3</sup>	<i>Thaleichthys pacificus</i>	308	121	185	150.5	4	A
Smelt	Osmeridae	21	34	63	45.8	3	J
Total non-salmonids captured		28,447	—	—	—	—	—
Total fish and squid captured		29,391	—	—	—	—	—

<sup>3</sup>J = juvenile or post larvae in first year at sea (i.e., age -.0), I = immature age -.1 or older in pre-spawn condition, and A = mature adult or near age of maturity.

<sup>4</sup>Total fish measured = 254 soft sculpin, 105 walleye pollock, 53 capelin, and 63 eulachon.

Table 6—Data associated with the diel sampling conducted at the ISC station in the Icy Strait transect with the NOAA ship *John N. Cobb* in marine waters of the northern region of southeastern Alaska, 28-30 September 2001.

Diel period	Date	Haul#	Time	Light W/m <sup>2</sup>	Zoop	Juvenile salmon					Other abundant fish			
						Pink	Chum	Sockeye	Coho	Chinook	Total	Walleye pollock	Eulachon	Soft sculpin
<b>D1</b>	28 Sept.	5102	0400	0	15.0	6	0	2	1	1	10	7,999	142	0
<b>D2</b>	28 Sept.	5103	0700	60	1.0	9	1	4	0	8	22	0	1	338
<b>D3</b>	28 Sept.	5104	1000	160	2.0	24	3	3	0	1	31	2	0	30
<b>D4</b>	28 Sept.	5105	1300	160	1.0	3	2	1	0	1	7	0	0	15
	29 Sept.	5107	1300	195	2.0	0	6	1	0	0	7	0	0	21
<b>D5</b>	29 Sept.	5108	1600	58	2.0	0	1	0	0	1	2	0	0	1
	30 Sept.	5116 <sup>5</sup>	1600	78	5.0	77	23	10	3	1	114 <sup>4</sup>	0	0	0
<b>D6</b>	29 Sept.	5109	1900	1	3.0	38	4	2	0	2	46	11,607	1	0
<b>D7</b>	29 Sept.	5110	2200	0	5.0	79	6	9	1	3	98	7,505	164	0
<b>Total</b>						236	46	32	5	18	337	27,111	308	405

<sup>5</sup>Haul duration doubled from 20 to 40 minutes to collect additional samples of juvenile salmon.

Table 7.- Percent frequency of occurrence of invertebrate and fish prey categories, and percent empty stomachs, of predators examined in September 2001 from marine waters of the northern region of southeastern Alaska. The number of stomachs examined is shown in parentheses for each species.

Prey category	Immature chinook (4)	Adult Coho (1)	Walleye pollock (9)
<b>Fish</b>			
Juvenile salmon	0	100	0
Capelin	50	0	0
Walleye pollock	25	0	0
<b>Invertebrates</b>			
Euphausiids	0	0	44
Shrimp	0	0	33
Amphipods, hyperiids	0	0	22
Other	0	0	11
Empty	25	0	33

Table 8.--Release and recovery information for coded-wire tagged salmon captured in the northern region of southeastern Alaska by rope trawl, NOAA ship *John N. Cobb*, 26 September - 01 October 2001.

Species	Release information					Recovery information					Marine distance traveled				
	Coded-wire tag code	Brood year	Agency <sup>6</sup>	Locality	Date	Size		Locality (station code)	Date	Size		Age <sup>7</sup> release	Days since	km	km/d
						mm	g			mm	g				
Chinook	04:03/93	1999	DIPAC	Gastineau Ch., AK	06/12/01	—	18.3	Icy Strait (ISB) Haul# 5098 Fish# 17	09/27/01	238	188.9	1.0	107	85	0.8
Chinook	04:03/93	1999	DIPAC	Gastineau Ch., AK	06/12/01	—	18.3	Chatham St. (UCA) Haul# 5117 Fish# 1	10/01/01	247	195.9	1.0	111	55	0.5
Chinook	04:48/19	1999	NSRAA	Kasnyku Bay, AK	06/05/01	—	40.5	Icy Strait (ISC) Haul# 5109 Fish# 17	09/29/01	270	290.0	1.0	116	130	1.1
Chinook	04:48/19	1999	NSRAA	Kasnyku Bay, AK	06/05/01	—	40.5	Icy Strait (ISC) Haul# 5110 Fish# 25	09/29/01	264	250.0	1.0	116	130	1.1
Chinook	No tag	—	—	—	—	—	—	Icy Strait (ISB) Haul# 5099 Fish# 12	09/27/01	442	1,260.0	—	—	—	—
Chinook	No tag	—	—	—	—	—	—	Icy Strait (ISD) Haul# 5115 Fish# 9	09/30/01	268	243.6	—	—	—	—
Coho	04:03/92	1999	DIPAC	Sheep Creek, AK	06/14/01	—	15.9	Chatham St. (UCB) Haul# 5118 Fish# 1	10/01/01	230	125.9	1.0	109	65	0.6
Coho	04:03/91	1999	DIPAC	Gastineau Ch., AK	06/14/01	—	21.8	Chatham St. (UCB) Haul# 5118 Fish# 3	10/01/01	271	213.2	1.0	109	55	0.5

<sup>6</sup> DIPAC=Douglas Island Pink and Chum Corporation and NSRA A=Northern Southeast Regional Aquaculture Association.

<sup>7</sup>European age notation, with the numeral before the decimal denoting the number of freshwater winters and the numeral following the decimal denoting marine winters.

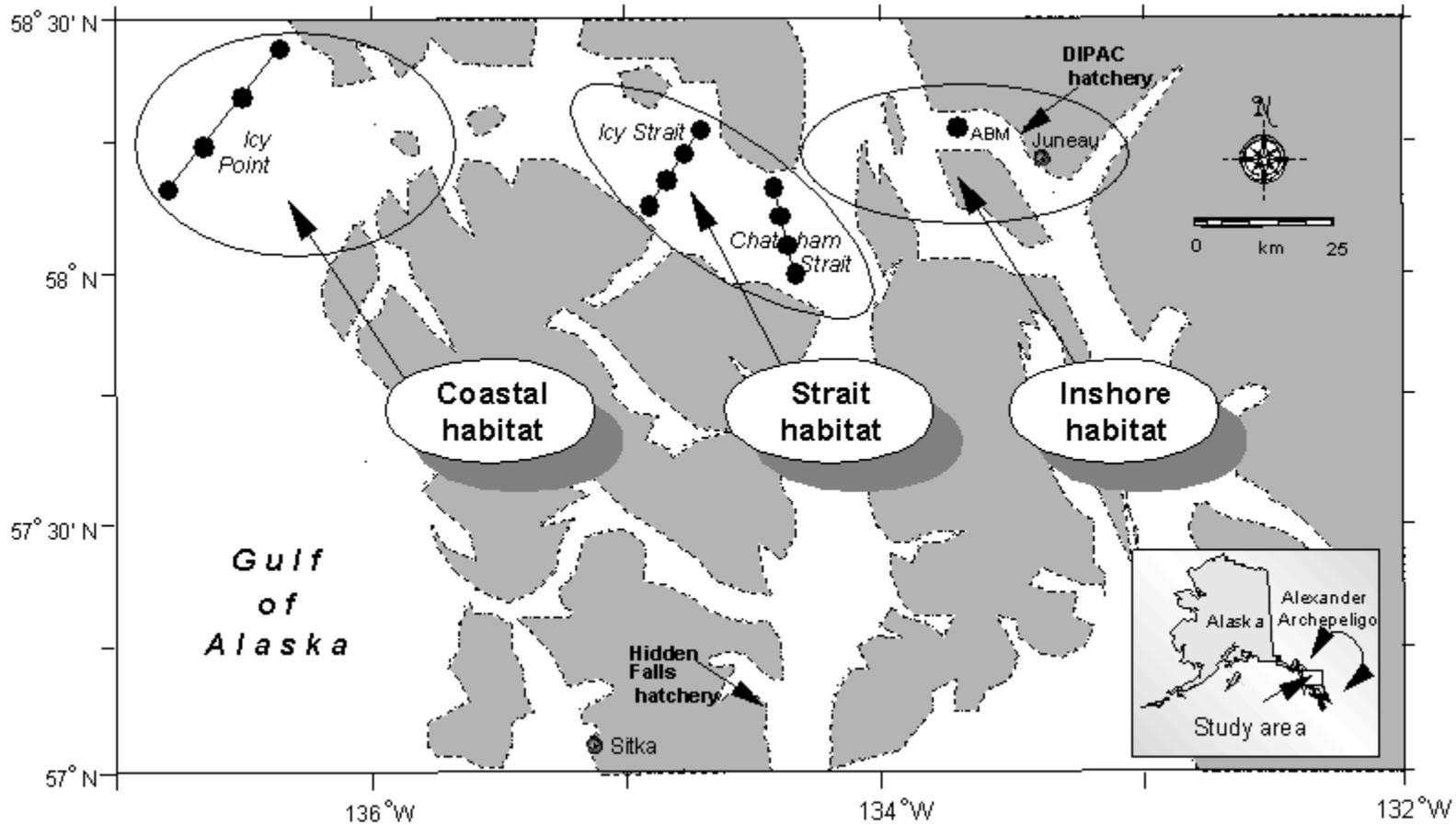


Figure 1.—Stations sampled monthly in three habitats (large arrows) of the marine waters of the northern region of southeastern Alaska, May–October 1997–2001. Small arrows indicate principal enhancement facilities, DIPAC (Douglas Island Pink and Chum) and Hidden Falls hatchery.