

Southeast Alaska Coastal Monitoring Project
JC-05-08 June 2005 Cruise Report

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Scientists from the Marine Salmon Investigations Program at Auke Bay Laboratory, Alaska Fisheries Science Center, National Marine Fisheries Service, NOAA Fisheries, conducted a 14-day cruise aboard the NOAA ship *John N. Cobb* in the marine waters of Southeast Alaska, 20 June to 3 July, 2005. This cruise (JC-05-08) was part of the Southeast Alaska Coastal Monitoring (SECM) Project, and took place in the second of four sampling periods scheduled for 2005. 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. In addition to salmon information, SECM provides information on other pelagic fish species, zooplankton and physical oceanography. An annual data report is presented to the North Pacific Anadromous Fish Commission in the year following sample collection and processing. The information is further summarized in publications and reports to improve understanding of trophic relationships among marine planktivores, to track long-term patterns and changes in the marine environment in response to climate change, to compare the Southeast Alaska marine ecosystem to other ecosystems in the region, to develop forecasting models for the commercial salmon harvest, and to develop bioenergetic models.

This year, the SECM project began a new, three-year component funded by the Pacific Salmon Commission Northern Fund to compare straits habitats in the northern and southern regions of Southeast Alaska. The new objectives include sampling in June and July along historical transects in northern Southeast Alaska (Icy Strait and Upper Chatham Strait) and two new transects in southern Southeast Alaska (Lower and Middle Clarence Strait). Objectives of this cruise are to: 1) collect and compare biological data on juvenile Pacific salmon and other pelagic fish species from surface rope trawl samples at stations in straits habitats in the two regions; 2) monitor physical and biological oceanographic indices of juvenile salmon in these habitats as well as in the inside waters station, Auke Bay Monitor (ABM); and, 3) conduct process studies focusing on bioenergetics of juvenile salmon.

Sampling in 2005 marks the ninth year of the SECM long-term study on how the intra- and inter-annual variability of physical and biological oceanographic indices relate to the distribution, abundance, growth, and survival of salmon and other fish populations at the same localities. The information collected also provides insight into potential effects of climate change on stock-specific growth timing and recruitment of salmonids, and the utilization of marine habitat by key

fish species. Ultimately, SECM will provide the information necessary to implement the ecosystem approach to management, EAM, for salmon and other managed species. In 2005, coastal habitat will be sampled for biological oceanographic information only in May and August, and no trawling is scheduled.

METHODS

Seventeen stations were scheduled for sampling during the June 2005 cruise (Table 1, Figures 1 and 2). Stations were located in Auke Bay and along two transects with four stations each in Middle Clarence Strait and Lower Clarence Strait in the southern region and two transects with four stations each in Upper Chatham Strait and Icy Strait in the northern region. Oceanographic measurements were taken at all stations; trawling was conducted twice at Upper Chatham and Middle Clarence Straits and three times at Icy and Lower Clarence Straits.

Oceanographic sampling:

The oceanographic sampling included physical and biological monitoring at each station. To examine horizontal water structure, temperature and salinity readings were continuously logged at one-minute intervals from 3-m depth using a SeaBird SBE-21¹ thermosalinograph mounted on the vessel hull. To examine vertical water structure, a Seabird SBE-19 conductivity-temperature-depth (CTD) profiler was deployed at each station to 200 m or within 10 m of the bottom, depending on bottom depth. Surface and 20-m water samples were taken once at each station for later determination of chlorophyll and nutrient content, using a bucket and a Niskin bottle. Ambient incident sunlight was measured with a Li-Cor Model LI-189¹ radiometer in Watts/m². During replicate trawls, only a 50-m CTD cast was taken; no water samples were taken.

Zooplankton was sampled at each station with conical nets hauled vertically and a bongo net system towed obliquely (Table 2). Vertical plankton hauls were retrieved from a depth of 20 m using a 50-cm frame, 243-micron mesh (Norpac) net. At Auke Bay (ABM) only, a WP2 net (202-micron mesh) sample was also hauled vertically from near bottom to the surface. At ABM and in the Icy Strait and Lower Clarence Strait transects, one double oblique bongo tow was deployed to 200 m or within 20 m of the bottom using a 60-cm frame with 505 and 333 micron mesh nets. Samples were concentrated and preserved for later laboratory analyses. In addition, at the request of J. Saldarriaga, UBC, Vancouver, a bongo sample from one station on each transect was collected from = 300 m depth and frozen for genetic studies of ellobiopsid parasites on euphausiids and other zooplankters. General Oceanics flow meters were placed inside each of the bongo nets to determine the water volume sampled. A Vemco minilog data logger was used to record depth and temperature for validation of maximum deployment depth of each bongo tow. During replicate trawls and at Upper Chatham and Middle Clarence Straits, only the Norpac sample was collected.

¹Reference to trade names does not imply endorsement by the NOAA Fisheries.

Trawl Sampling:

Sampling for fish was accomplished with Nordic¹ 264 rope trawl fished directly astern the *John N. Cobb* at the surface. 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.

After each haul, the fish caught were anaesthetized with tricaine methanesulfonate, identified, enumerated, measured, and stomachs sampled (if appropriate). The biomass of jellyfish retained by the net was estimated volumetrically and species were identified when possible. Fish were measured to the nearest mm fork length (FL) with a Limnoterra FMB IV electronic measuring board. A subsample of at least 50 specimens of each species was frozen in individually-labeled bags, for later laboratory analyses (see below). If available, a subsample of 60 unmeasured juvenile chum and 15 unmeasured juvenile pink salmon was also preserved in 10% formalin-seawater solution, for later diet analyses; these fish were transferred to 50% isopropyl alcohol solution within a week of collection to maintain otoliths for stock identification. The heads of all chinook (*O. tshawytscha*) and coho (*O. kisutch*) salmon lacking adipose fins were retained for examination for coded-wire tags (CWT). Stomachs from potential predators of juvenile salmon were excised, weighed, and classified by fullness. Stomach contents were removed and prey were generally identified to species and/or major taxon and contribution estimated 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 on settled volumes (SVs) of zooplankton in the 20-m vertical hauls and from decoded CWTs of fish lacking adipose fins are included in this report. Laboratory processing in progress includes 1) measurement of weight and condition of juvenile salmon; 2) determination of energetic content from frozen samples of juvenile pink (*O. gorbuscha*), chum (*O. keta*), and coho salmon (*O. kisutch*); 3) examination for otolith thermal marks representing stocks of origin in frozen samples of juvenile chum, sockeye (*O. nerka*), coho, and chinook (*O. tshawytscha*) salmon; 4) scale samples of each species of juvenile salmon; 5) measurement of displacement volumes of all bongo net plankton samples; 6) zooplankton species composition and abundance from all Norpac hauls and from bongo net samples taken at Icy Strait and Lower Clarence Strait stations; 7) determination of chlorophyll and nutrient concentrations from surface and 20-m water samples; 8) determination of the stomach contents of juvenile pink and chum salmon; and 9) analysis of temperature-salinity-fluorescence profiles. An annual data report of these laboratory analyses will be included in a North Pacific Anadromous Fish Commission (NPAFC) document in the year subsequent to sample collection.

RESULTS and DISCUSSION

All seventeen stations scheduled for sampling in the two regions of Southeast Alaska were sampled (Table 1). Standard oceanographic sampling and surface trawling were conducted according to the following schedule:

Day 1: transit from Juneau subport to southern Southeast Alaska (~200 nm);

Day 2: Middle Clarence Strait (4 stations);

Day 3: Lower Clarence Strait transect (4 stations);

Day 4: Middle Clarence Strait (4 stations);

Day 5: Lower Clarence Strait (4 stations);

Day 6: Lower Clarence Strait (4 stations);

Day 7: transit north to Auke Bay and offload samples at ABL;

Day 8: Auke Bay Monitor (1 station);

Day 9: Upper Chatham Strait transect (4 stations);

Day 10: Icy Strait transect (4 stations);

Day 11: Upper Chatham Strait transect (4 stations);

Day 12: Icy Strait transect (4 stations);

Day 13: Icy Strait transect (4 stations);

Day 14: transit to Juneau NMFS Subport to offload gear.

Oceanographic samples collected from the 17 stations included 41 CTD casts, 43 Norpac tows, 13 bongo tows (16 net samples preserved, 10 net samples frozen for piggyback project on euphausiid parasites) and 34 water samples (for chlorophyll and nutrients analysis) (Table 2). Twenty trawl hauls were made in each region, including three series across Lower Clarence and two series across Middle Clarence transects in the southern region of Southeast Alaska, and three series across Icy Strait and two series across Upper Chatham Strait transects in the northern region of Southeast Alaska. No trawling was conducted at ABM, a shallow embayment (Table 3).

Surface (3-m) temperatures ranged from 12.2 to 15.4°C and salinities ranged from 16.2 to 29.0 PSU in straits habitats (Table 2). Average temperatures were similar in the northern and southern regions, slightly above 14°C, but average salinity was higher in the southern than in the northern region (~27.5 vs. 21 PSU). A noticeably warmer, freshened layer of surface water moved into the northern region between the June 29 and July 1 sampling dates; at station ISA on the south side of the Icy Strait transect, for example, temperature increased by nearly 3°C and salinity dropped by 9 PSU in the two days. A similar, but less dramatic, pattern was observed in the southern region. Compared to all years sampled since 1997 at nearly the same date, the June 2005 average temperatures in straits in the northern region were at least 1.5 °C warmer than all except 2004 (data on file, Auke Bay Lab). Conditions at ABM station in Auke Bay were 13.9°C and 20.9 PSU, similar to average conditions in late June for this location.

Zooplankton biomass, as determined from SVs of the 20-m vertical tow samples, ranged from 5 to 24 ml (Table 2), with similar mean values in the northern and southern regions (~10.5-12 ml). No measurable phytoplankton was present at any station; laboratory analyses of water samples will provide further information on primary production and nutrient levels. Mean jellyfish biomass was much higher in the southern region than in the northern region, 133-236 liters per trawl compared to <2 liters per trawl. The principal genera were *Aurelia* and *Cyanea*, with smaller amounts of *Aequorea* and *Chrysaora*.

Juvenile salmon were caught at all strait stations in both regions. Totals of 2,686 and 2,572 juvenile salmon were collected from 20 rope trawl hauls each in the southern and northern regions (Tables 3, 4, and 5). Adult and immature salmon catches included four and ten individuals in the southern and northern regions, respectively, and were mainly chinook and pink salmon (Tables 3 and 4). Juvenile salmon were the most frequently-occurring taxon, with coho, pink, chum and sockeye salmon each present in 67-100% of hauls per transect/region (Table 5). Pink and chum salmon were most abundant, but the dominant species was opposite in the two regions; 1665 pink salmon and 671 chum salmon were caught in the southern region, while 495 pink salmon and 1650 chum salmon were caught in the northern region. Juvenile coho salmon were also relatively abundant, with 183 and 264 caught in the southern and northern regions; juvenile sockeye salmon catches totaled 160 and 154 in these regions. Juvenile chinook catches were the lowest of all juvenile salmon species, with seven and nine caught in the southern and northern regions, respectively. Movement of juvenile salmon into the northern region corresponded with the intrusion of the warm, fresh water during two days at the end of June, whereas, in Lower Clarence Strait in the southern region, catches declined over three days in correspondence with movement into the sampling area of cooler, higher salinity water (Tables 2 and 3). Mean lengths of juvenile salmon species caught in the two regions were similar (Table 6).

A total of 87 and 20 non-salmonids in 12 identifiable species were caught in the southern and northern regions, respectively (Tables 4 and 5). The majority of these species were Walleye pollock (*Theragra chalcogramma*) larvae and market squid (*Loligo opalescens*; from one haul) in the southern region and crested sculpin (*Blepsias bilobus*) in the northern region.

Samples of juvenile pink and chum salmon were collected for comparative bioenergetic s/process studies between the regions. Concomitant with the catch distribution by region, fewer juvenile chum salmon were frozen for energy density ($n = 316$) and preserved for diet studies ($n = 332$) from the southern region than from the northern region ($n = 713$ frozen, $n = 427$ preserved). In contrast, more juvenile pink salmon were frozen ($n = 678$) and preserved ($n = 154$) from the southern region than from the northern region ($n = 373$ frozen, $n = 119$ preserved). Laboratory analyses of these samples will ensue following identification of stocks of origin from otolith thermal marks by contracted agencies.

Stock identification was assessed for 55 salmon lacking the adipose fin. In catches from the southern region, only one of three chinook and seven of 41 coho salmon had tags; in catches from the northern region, four out of five chinook and all six coho salmon had tags (Table 8). Tags from juvenile salmon caught in the southern region included releases by agencies located in Oregon, Washington and southern Southeast Alaska; tags from juvenile salmon caught in the northern region included releases by agencies located only in northern Southeast Alaska. The high prevalence of salmon lacking adipose fins, but without CWTs, and captured in the southern region suggests the fish originated from stocks in the Pacific Northwest, where adipose fin clipping of juveniles from hatcheries is mandatory; only one clipped and untagged chinook was captured in northern Southeast Alaska. Most recoveries of tagged salmon were from brood year 2003; the exceptions included two chinook salmon, from brood years 1999 and 2001 released at Fish Creek, near Juneau.

Stomach analysis was done on 15 potential predators of juvenile salmon while onboard the vessel. Six immature and juvenile Chinook salmon, five adult pink salmon, one adult coho salmon, one immature sockeye salmon, one starry flounder (*Platichthys stellatus*), and one adult spiny dogfish (*Squalus acanthias*) were examined. One chinook salmon stoma was empty. The only observed predation on juvenile salmon was by the dogfish (which also ate cephalopods). The principal prey of chinook and coho salmon were fish (herring and unknown larvae); pink salmon ate pteropods and crab larvae, the sockeye salmon ate pteropods, and the starry flounder ate crab larvae.

ACKNOWLEDGMENTS

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

Table 1.—Localities and coordinates of stations scheduled for oceanographic and biological sampling in the marine waters of the northern and southern regions of Southeast Alaska using the NOAA ship *John N. Cobb*, 20 June to 3 July 2005. Distance between stations within a transect is 3.2 km.

Locality	Station	Latitude	Longitude	Offshore distance (km)	Bottom depth (m)
Northern region					
Auke Bay Monitor	ABM	58°22.00'N	134°40.00'W	1.5	60
Upper Chatham Strait	UCA	58°04.57'N	135°00.08'W	3.2	400
Upper Chatham Strait	UCB	58°06.22'N	135°00.91'W	6.4	100
Upper Chatham Strait	UCC	58°07.95'N	135°04.00'W	6.4	100
Upper Chatham Strait	UCD	58°09.64'N	135°02.52'W	3.2	200
Icy Strait	ISA	58°13.25'N	135°31.76'W	3.2	128
Icy Strait	ISB	58°14.22'N	135°29.26'W	6.4	200
Icy Strait	ISC	58°15.28'N	135°26.65'W	6.4	200
Icy Strait	ISD	58°16.38'N	135°23.98'W	3.2	234
Southern region					
Middle Clarence Strait	MCA	55°23.505'N	131°55.492'W	3.2	346
Middle Clarence Strait	MCB	55°24.255'N	131°58.228'W	6.4	439
Middle Clarence Strait	MCC	55°25.061'N	132°01.194'W	6.4	412
Middle Clarence Strait	MCD	55°25.792'N	132°03.930'W	3.2	461
Lower Clarence Strait	LCA	55°07.370'N	131°48.094'W	3.2	413
Lower Clarence Strait	LCB	55°07.321'N	131°51.088'W	6.4	459
Lower Clarence Strait	LCC	55°07.136'N	131°53.793'W	6.4	466
Lower Clarence Strait	LCD	55°06.927'N	131°56.787'W	3.2	315

Table 2.—Oceanographic data and number of biological samples collected in the marine waters of the southern and northern regions of Southeast Alaska using the NOAA ship *John N. Cobb* during cruise JC-05-08, 20 June to 3 July, 2005. Water samples for nutrient and chlorophyll analyses include surface and 20-m samples. Bongo samples include paired 333- and 505- μ m mesh nets; asterisk indicates sample frozen for assessment of ellobiopsid parasites of zooplankton.

Station	Date	Haul Number	Time	Temp. (°C)	Salinity (PSU)	Light (W/m ²)	CTD depth (m)	Secchi (m)	Water samples	Bongo samples	Norpac samples	SV Norpac Zoop. (ml)	Jellyfish (liters)
Southern Region													
Lower Clarence Strait (LC)													
LCD	22 June	9019	17:45	14.3	27.9	21	200	5	2	1	1	12.0	94
LCC	22 June	9020	14:30	14.5	27.6	139	200	5	2	2*	1	9.0	172
LCB	22 June	9021	11:50	13.9	28.0	208	200	5	2	1	1	9.0	333
LCA	22 June	9022	8:30	12.8	29.0	680	200	5	2	1	1	24.0	97
LCA	24 June	9027	9:00	14.0	27.9	177	50	5	0	0	1	18.5	416
LCB	24 June	9028	10:54	14.0	28.3	940	50	5	0	0	1	8.5	370
LCC	24 June	9029	12:58	15.0	28.2	830	50	6	0	0	1	6.0	241
LCD	24 June	9030	14:53	13.9	28.7	450	50	6	0	0	1	8.0	273
LCD	25 June	9031	8:00	13.2	28.6	123	50	6	0	0	1	7.0	185
LCC	25 June	9032	10:20	13.8	28.1	154	50	6	0	0	1	9.0	157
LCB	25 June	9033	12:00	14.1	28.1	198	50	6	0	0	1	10.0	213
LCA	25 June	9034	13:40	14.3	28.2	665	50	6	0	0	1	8.0	277
LC averages and totals				14.0	28.2	382		5.5	8	5	12	10.8	236
Middle Clarence Strait (MC)													
MCD	21 June	9015	14:55	15.4	26.6	191	300	5.5	2	2*	1	12.0	157
MCC	21 June	9016	13:00	15.1	26.6	267	50	6	2	0	1	13.0	130
MCB	21 June	9017	10:30	15.1	26.8	450	50	5	2	0	1	6.0	185
MCA	21 June	9018	8:00	14.9	26.7	588	50	4	2	0	1	16.0	102
MCD	23 June	9023	8:40	12.8	28.7	58	50	5	0	0	1	7.0	78
MCC	23 June	9024	10:45	13.8	27.7	50	50	5	0	0	1	9.0	207
MCB	23 June	9025	13:30	13.9	27.6	141	50	5	0	0	1	9.0	115
MCA	23 June	9026	16:04	13.9	27.3	67	50	4	0	0	1	9.0	93
MC averages and totals				14.4	27.3	227		4.9	8	2	8	10.1	133

Station	Date	Haul Number	Time	Temp. (°C)	Salinity (PSU)	Light (W/m ²)	CTD depth (m)	Secchi (m)	Water samples	Bongo samples	Norpac samples	SV Norpac Zoop. (ml)	Jellyfish (liters)
Northern Region													
Inshore													
ABM	27 June	9035	14:30	13.9	20.9	190	50	3	2	2*	3	14.0	--
Icy Strait (IS)													
ISA	29 June	9040	7:25	12.2	26.5	51	93	3	2	1	1	11.0	0.75
ISB	29 June	9041	9:30	13.7	23.1	105	165	3	2	1	1	10.0	1.75
ISC	29 June	9042	12:30	13.8	20.9	110	200	3.5	2	2*	1	18.0	0
ISD	29 June	9043	16:15	14.3	20.4	220	200	4	2	1	1	20.0	1.3
ISA	01 July	9048	7:25	15.1	17.9	43	50	3	0	0	1	12.0	1.5
ISB	01 July	9049	9:10	15.0	17.9	63	50	3	0	0	1	12.5	1.5
ISC	01 July	9050	11:30	14.6	21.4	97	50	3	0	0	1	5.0	0.8
ISD	01 July	9051	13:40	14.5	21.8	38	50	4	0	0	1	12.5	0.3
ISA	02 July	9052	7:45	14.6	20.5	58	50	5	0	0	1	13.0	1.5
ISB	02 July	9053	9:30	13.3	23.3	86	50	5	0	0	1	15.0	1.0
ISC	02 July	9054	12:30	13.9	23.2	168	50	5	0	0	1	5.0	2.0
ISD	02 July	9055	14:00	13.9	23.1	195	50	5	0	0	1	5.0	3.5
IS averages and totals				14.1	21.7	103		3.9	8	5	12	11.6	1.3
Upper Chatham Strait (UC)													
UCD	28 June	9036	9:00	14.7	19.7	31	50	3	2	0	1	16.0	2.5
UCC	28 June	9037	10:20	14.4	20.3	51	50	3	2	0	1	7.5	1
UCB	28 June	9038	12:25	14.3	21.9	142	50	3	2	0	1	30.0	1.5
UCA	28 June	9039	14:30	13.2	26.1	70	300	4	2	2*	1	6.5	4
UCD	30 June	9044	7:50	14.5	16.2	70	50	3	0	0	1	11.0	1.5
UCC	30 June	9045	10:30	14.3	17.7	418	50	3	0	0	1	9.0	0.8
UCB	30 June	9046	13:15	14.4	20.4	441	50	3	0	0	1	11.0	0.8
UCA	30 June	9047	15:00	14.2	24.4	790	62	4	0	0	1	10.0	2.5
UC averages and totals				14.3	20.8	252		3.3	8	2	8	12.6	1.8

Table 3.—Rope trawl catches of salmon at stations sampled in the marine waters of the southern and northern regions of southeastern Alaska, using the NOAA ship *John N. Cobb* during cruise JC-05-08, 20 June to 3 July, 2005.

Station	Date	Haul number	Juvenile salmon						Immature and adult salmon					
			Chum	Pink	Sockeye	Coho	Chinook	Subtotal	Chinook (imm.)	Chinook (adult)	Pink (adult)	Coho (adult)	Sockeye (adult)	Subtotal
Southern Region														
Lower Clarence Strait (LC)														
LCD	22 June	9019	10	46	0	1	1	58	1	0	0	0	0	1
LCC	22 June	9020	23	69	5	9	1	107	0	0	0	0	0	0
LCB	22 June	9021	26	105	3	29	0	163	0	0	0	0	0	0
LCA	22 June	9022	24	79	23	27	0	153	0	0	0	0	0	0
LCA	24 June	9027	11	6	0	9	0	26	0	0	0	0	0	0
LCB	24 June	9028	39	129	8	1	0	177	0	0	0	0	0	0
LCC	24 June	9029	47	57	18	5	0	127	0	0	0	0	0	0
LCD	24 June	9030	15	14	7	4	0	40	0	0	0	0	0	0
LCD	25 June	9031	1	0	0	12	0	13	0	0	0	1	0	1
LCC	25 June	9032	6	0	3	22	0	31	0	0	0	0	0	0
LCB	25 June	9033	0	0	3	1	0	4	0	0	0	0	0	0
LCA	25 June	9034	23	27	16	5	1	72	1	0	0	0	0	1
LC Subtotal			225	532	86	125	3	971	2	0	0	1	0	3
Middle Clarence Strait (MC)														
MCD	21 June	9015	43	76	12	4	0	135	0	0	0	0	0	0
MCC	21 June	9016	89	94	19	8	2	212	0	0	0	0	0	0
MCB	21 June	9017	86	353	19	7	0	465	0	0	0	0	0	0
MCA	21 June	9018	30	139	1	0	0	170	0	0	0	0	0	0
MCD	23 June	9023	9	17	6	14	0	46	1	0	0	0	0	1
MCC	23 June	9024	15	74	5	4	1	99	0	0	0	0	0	0
MCB	23 June	9025	82	216	10	10	1	319	0	0	0	0	0	0
MCA	23 June	9026	92	164	2	11	0	269	0	0	0	0	0	0
MC Subtotal			446	1133	74	58	4	1715	1	0	0	0	0	1
Southern region subtotal			671	1665	160	183	7	2686	3	0	0	1	0	4

Station	Date	Haul number	Juvenile salmon						Immature and adult salmon					
			Chum	Pink	Sockeye	Coho	Chinook	Subtotal	Chinook (imm.)	Chinook (adult)	Pink (adult)	Coho (adult)	Sockeye (adult)	Subtotal
Northern Region														
Icy Strait (IS)														
ISA	29 June	9040	1	0	0	0	0	1	0	0	0	0	0	0
ISB	29 June	9041	1	2	0	13	0	16	0	0	0	0	0	0
ISC	29 June	9042	14	0	2	24	2	42	1	1	0	0	0	2
ISD	29 June	9043	294	39	21	16	1	371	0	0	0	0	1	1
ISA	1 July	9048	20	2	4	5	0	31	0	0	0	0	0	0
ISB	1 July	9049	143	97	5	16	0	261	0	0	0	0	0	0
ISC	1 July	9050	65	27	4	2	0	98	0	0	2	0	0	2
ISD	1 July	9051	43	157	4	3	1	208	0	0	0	0	0	0
ISA	2 July	9052	83	24	4	2	0	113	0	0	1	0	0	1
ISB	2 July	9053	671	56	53	11	0	791	0	0	0	0	0	0
ISC	2 July	9054	1	0	0	1	0	2	0	0	0	0	0	0
ISD	2 July	9055	26	0	3	30	0	59	0	0	1	0	0	1
		IS Subtotal	1362	404	100	123	4	1993	1	1	4	0	1	7
Upper Chatham (UC) Strait														
UCD	28 June	9036	8	2	4	9	1	24	0	0	0	0	0	0
UCC	28 June	9037	43	9	6	17	0	75	0	0	0	0	0	0
UCB	28 June	9038	3	2	2	34	0	41	0	0	0	0	0	0
UCA	28 June	9039	16	2	2	6	1	27	0	0	1	0	0	1
UCD	30 June	9044	57	60	20	20	1	158	2	0	0	0	0	2
UCC	30 June	9045	112	8	11	20	2	153	0	0	0	0	0	0
UCB	30 June	9046	48	7	9	29	0	93	0	0	0	0	0	0
UCA	30 June	9047	1	1	0	6	0	8	0	0	0	0	0	0
		UC Subtotal	288	91	54	141	5	579	2	0	1	0	0	3
Northern region subtotal			1650	495	154	264	9	2572	3	1	5	0	1	10
Grand Total			2321	2160	314	447	16	5258	6	1	5	1	1	14

Table 4.—Juvenile salmon, adult and immature salmon, and non-salmonid catches from rope trawl hauls using the NOAA ship *John N. Cobb* in the marine waters of the southern and northern regions of southeastern Alaska, 20 June-3 July 2005.

Station	Date	Haul number	Juv. Salmon subtotal	Adult-immature Salmon subtotal	Market squid	Crested sculpin	Pacific herring	Pacific cod larva	Agonidae (poacher)	Prowfish	smooth lump sucker	Spiny dogfish	Goniatidae (red squid)	Starry flounder	Unknown larvae	Walleye pollock larvae	Wolf-eel	Non-salmonid subtotal	Grand total
Southern region																			
Lower Clarence Strait (LC)																			
LCD	22 June	9019	58	1	0	0	0	0	0	1	0	0	1	0	0	1	0	3	62
LCC	22 June	9020	107	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	107
LCB	22 June	9021	163	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	163
LCA	22 June	9022	153	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	153
LCA	24 June	9027	26	0	0	0	0	0	1	1	0	0	0	1	0	0	0	3	29
LCB	24 June	9028	177	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	177
LCC	24 June	9029	127	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	128
LCD	24 June	9030	40	0	0	0	0	1	0	0	0	0	0	1	0	8	0	10	50
LCD	25 June	9031	13	1	0	0	0	0	0	1	0	0	0	0	0	0	0	1	15
LCC	25 June	9032	31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	31
LCB	25 June	9033	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
LCA	25 June	9034	72	1	0	0	0	0	0	0	0	0	0	0	0	1	0	1	74
LC Subtotal			971	3	0	0	0	1	1	4	0	0	1	2	0	10	0	19	993
Middle Clarence Strait (MC)																			
MCD	21 June	9015	135	0	0	0	1	0	0	0	0	0	1	0	0	1	0	3	138
MCC	21 June	9016	212	0	63	0	0	0	0	0	0	1	0	0	0	0	0	64	276
MCB	21 June	9017	465	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	465
MCA	21 June	9018	170	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	170
MCD	23 June	9023	46	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	47
MCC	23 June	9024	99	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	99
MCB	23 June	9025	319	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	320
MCA	23 June	9026	269	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	269
MC Subtotal			1715	1	63	0	2	0	0	0	0	1	1	0	0	1	0	68	1784
Subtotal Southern			2686	4	63	0	2	1	1	4	0	1	2	2	0	11	0	87	2777

Station	Date	Haul number	Juv. Salmon subtotal	Adult-immature Salmon subtotal	Market squid	Crested sculpin	Pacific herring	Pacific cod larva	Agonidae (poacher)	Prowfish	smooth lump sucker	Spiny dogfish	Goniatidae (red squid)	Starry flounder	Unknown larvae	Walleye pollock larvae	Wolf-eel	Non-salmonid subtotal	Grand total
Northern Region																			
Icy Strait (IS)																			
ISA	29 June	9040	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
ISB	29 June	9041	16	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	17
ISC	29 June	9042	42	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	44
ISD	29 June	9043	371	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	373
ISA	1 July	9048	31	0	0	3	0	0	0	0	0	0	0	0	0	0	0	3	34
ISB	1 July	9049	261	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	262
ISC	1 July	9050	98	2	0	0	0	0	0	0	0	0	0	0	0	0	1	1	101
ISD	1 July	9051	208	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	208
ISA	2 July	9052	113	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	115
ISB	2 July	9053	791	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	792
ISC	2 July	9054	2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	3
ISD	2 July	9055	59	1	0	0	1	0	0	0	1	0	0	0	0	0	0	2	62
IS Subtotal			1993	7	0	7	2	0	0	0	1	0	0	0	0	0	2	12	2012
Upper Chatham Strait (UC)																			
UCD	28 June	9036	24	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	25
UCC	28 June	9037	75	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	76
UCB	28 June	9038	41	0	0	1	0	0	0	1	0	0	0	0	1	0	0	3	44
UCA	28 June	9039	27	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	28
UCD	30 June	9044	158	2	0	0	0	0	0	1	0	0	0	0	0	0	0	1	161
UCC	30 June	9045	153	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	153
UCB	30 June	9046	93	0	0	1	0	0	0	0	0	0	0	0	0	1	0	2	95
UCA	30 June	9047	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8
UC Subtotal			579	3	0	4	0	0	0	2	0	0	0	0	1	1	0	8	590
Subtotal Northern			2572	10	0	11	2	0	0	2	1	0	0	0	1	1	2	20	2602
Grand total			5258	14	63	11	4	1	1	6	1	1	2	2	1	12	2	107	5379

Table 5.—Frequency of occurrence (FO) and %FO of fish caught in 40 rope trawl hauls using the *John N. Cobb* in the marine waters of the southern and northern regions of southeastern Alaska, 20 June to 3 July 2005. The number of hauls per transect is shown in parentheses.

Species	Southern Region				Northern Region			
	Lower Clarence Strait (12)		Middle Clarence Strait (8)		Icy Strait (12)		Upper Chatham (8)	
	FO	%	FO	%	FO	%	FO	%
Pink	9	75.0	8	100.0	8	66.7	8	100.0
Chum	11	91.7	8	100.0	12	100.0	8	100.0
Sockeye	9	75.0	8	100.0	9	75.0	7	87.5
Chinook	3	25.0	3	37.5	3	25.0	4	50.0
Coho	12	100.0	7	87.5	11	91.7	8	100.0
Chinook (adult)	0	0.0	0	0.0	1	8.3	0	0.0
Chinook (imm.)	2	16.7	1	12.5	1	8.3	1	12.5
Pink (adult)	0	0.0	0	0.0	3	25.0	1	12.5
Coho (adult)	1	8.3	0	0.0	0	0.0	0	0.0
Sockeye (adult)	0	0.0	0	0.0	1	8.3	0	0.0
Crested sculpin	0	0.0	0	0.0	5	41.7	4	50.0
Pacific herring	0	0.0	2	25.0	2	16.7	0	0.0
Pacific cod larvae	1	8.3	0	0.0	0	0.0	0	0.0
Agonidae	1	8.3	0	0.0	0	0.0	0	0.0
Prowfish	4	33.3	0	0.0	0	0.0	2	25.0
Smooth lump sucker	0	0.0	0	0.0	1	8.3	0	0.0
Spiny dogfish	0	0.0	1	12.5	0	0.0	0	0.0
Squid (Gonatidae)	1	8.3	1	12.5	0	0.0	0	0.0
Market squid	0	0.0	1	12.5	0	0.0	0	0.0
Starry flounder	2	16.7	0	0.0	0	0.0	0	0.0
Unknown larvae	0	0.0	0	0.0	0	0.0	1	12.5
Walleye pollock larvae	3	25.0	1	12.5	0	0.0	1	12.5
Wolf-eel	0	0.0	0	0.0	2	16.7	0	0.0

Table 6.—Length (minimum, maximum and mean fork length, mm) and life history stage of fish measured from 40 rope trawl hauls using the NOAA ship *John N. Cobb* in the marine waters of the southern and northern regions of southeastern Alaska, 20 June to 3 July 2005. Life history stage abbreviations are: L = larvae, J = juvenile in first year at sea, I = immature, and A = mature adult fish.

Common name	Genus species or Family	Number measured	Life history stage	Min length (mm)	Max length (mm)	Mean length (mm)	SD length
Southern Region							
Lower Clarence Strait							
Pink	<i>Oncorhynchus gorbuscha</i>	481	J	65	221	88.2	13.1
Chum	<i>O. keta</i>	101	J	65	170	96.6	13.6
Sockeye	<i>O. nerka</i>	85	J	75	150	112.4	15.6
Coho	<i>O. kisutch</i>	125	J	120	226	179.0	22.4
Chinook	<i>O. tshawytscha</i>	3	J	164	241	190.3	43.9
Coho	<i>O. kisutch</i>	2	A	643	643	643.0	0.0
Chinook	<i>O. tshawytscha</i>	2	I	342	861	601.5	367.0
Walleye pollock	<i>Theragra chalcogramma</i>	11	L	33	79	43.8	12.4
Prowfish	<i>Zaprora silenus</i>	4	J	35	82	58.0	19.4
Starry flounder	<i>Platichthys stellatus</i>	2	A	250	432	341.0	128.7
Pacific cod	<i>Gadus macrocephalus</i>	1	L	39	39	39.0	0.0
Poacher	Family Agonidae	1	J	46	46	46.0	0.0
Squid	Family Gonatidae	1	A	64	64	64.0	0.0
Middle Clarence Strait							
Pink	<i>O. gorbuscha</i>	1054	J	55	125	89.1	9.9
Chum	<i>O. keta</i>	232	J	65	133	93.7	15.0
Sockeye	<i>O. nerka</i>	74	J	67	163	107.6	20.5
Coho	<i>O. kisutch</i>	58	J	113	221	183.8	22.0
Chinook	<i>O. tshawytscha</i>	4	J	176	240	209.3	29.1
Chinook	<i>O. tshawytscha</i>	1	I	431	431	431.0	0.0
Pacific herring	<i>Clupea pallasii</i>	2	J	111	134	122.5	16.3
Walleye pollock	<i>Theragra chalcogramma</i>	1	L	35	35	35.0	0.0
Spiny dogfish	<i>Squalus acanthias</i>	1	A	730	730	730.0	0.0
Market squid	<i>Loligo opalescens</i>	63	A	74	109	87.5	6.8
Northern Region							
Icy Strait							
Pink	<i>O. gorbuscha</i>	282	J	85	143	108.6	9.9
Chum	<i>O. keta</i>	684	J	85	211	115.0	11.7
Sockeye	<i>O. nerka</i>	100	J	82	173	117.9	16.0
Coho	<i>O. kisutch</i>	122	J	121	243	194.3	20.7
Chinook	<i>O. tshawytscha</i>	4	J	178	261	205.8	37.9
Pink	<i>O. gorbuscha</i>	4	A	455	561	531.3	51.1
Chinook	<i>O. tshawytscha</i>	1	I	420	420	420.0	0.0

Common name	Genus species or Family	Number measured	Life history stage	Min length (mm)	Max length (mm)	Mean length (mm)	SD length
Chinook	<i>O. tshawytscha</i>	1	A	848	848	848.0	0.0
Sockeye	<i>O. nerka</i>	1	A	607	607	607.0	0.0
Crested sculpin	<i>Blepsias bilobus</i>	6	J	55	117	77.2	22.2
Wolf-eel	<i>Anarrhichthys ocellatus</i>	2	J	330	357	343.5	19.1
Pacific herring	<i>Clupea pallasii</i>	2	J	125	187	156.0	43.8
Prowfish	<i>Zaprora silenus</i>	1	J	14	14	14.0	0.0
Smooth lumpsucker	<i>Aptocyclus ventricosus</i>	1	A	210	210	210.0	0.0
Upper Chatham Strait							
Pink	<i>O. gorbuscha</i>	69	J	85	131	104.7	9.4
Chum	<i>O. keta</i>	149	J	79	137	109.2	10.2
Sockeye	<i>O. nerka</i>	141	J	111	253	178.8	23.4
Coho	<i>O. kisutch</i>	74	J	85	155	118.8	17.3
Chinook	<i>O. tshawytscha</i>	5	J	183	266	209.6	32.6
Pink	<i>O. gorbuscha</i>	1	A	582	582	582.0	0.0
Chinook	<i>O. tshawytscha</i>	2	I	615	833	724.0	154.2
Crested sculpin	<i>Blepsias bilobus</i>	4	J	37	205	97.5	73.9
Prowfish	<i>Zaprora silenus</i>	2	J	34	55	44.5	14.9
Walleye Pollock	<i>Theragra chalcogramma</i>	1	L	41	41	41.0	0.0

Table 7.— Numbers of juvenile salmon frozen for calorimetry or preserved for diet studies, from trawl collections in the marine waters of the southern and northern regions of southeastern Alaska, 20 June to 3 July, 2005.

Station	Date	Haul Number	Frozen samples		Preserved samples	
			Juv. Chum	Juv. Pink	Juv. Chum	Juv. Pink
Southern Region						
Lower Clarence Strait						
LCA	22 June	9022	24	50	0	0
LCB	22 June	9021	26	50	0	0
LCC	22 June	9020	23	40	0	0
LCD	22 June	9019	10	45	0	0
LCA	24 June	9027	0	0	11	6
LCB	24 June	9028	0	50	39	15
LCC	24 June	9029	0	42	47	15
LCD	24 June	9030	0	0	15	14
LCA	25 June	9034	0	0	23	27
LCC	25 June	9032	6	0	0	0
LCD	25 June	9031	1	0	0	0
	Subtotal		90	277	135	77
Middle Clarence Strait						
MCA	21 June	9018	30	50	0	15
MCB	21 June	9017	47	55	27	15
MCC	21 June	9016	29	79	60	15
MCD	21 June	9015	43	50	0	0
MCA	23 June	9026	32	50	60	17
MCB	23 June	9025	21	50	60	15
MCC	23 June	9024	15	50	0	0
MCD	23 June	9023	9	17	0	0
	Subtotal		226	401	207	77
Southern Region Total			316	678	332	154
Northern Region						
ISA	29 June	9040	1	0	0	0
ISB	29 June	9041	1	2	0	0
ISC	29 June	9042	14	0	0	0
ISD	29 June	9043	234	24	60	15
ISA	1 July	9048	10	1	10	0
ISB	1 July	9049	83	82	60	14
ISC	1 July	9050	30	11	35	15
ISD	1 July	9051	21	142	21	15
ISA	2 July	9052	42	9	41	15
ISB	2 July	9053	101	41	60	15
ISC	2 July	9054	1	0	0	0
ISD	2 July	9055	26	0	0	0
	Subtotal		564	312	289	89
Upper Chatham Strait						
UCA	28 June	9039	15	2	0	0
UCB	28 June	9038	3	2	0	0
UCC	28 June	9037	43	9	0	0
UCD	28 June	9036	8	2	0	0
UCA	30 June	9047	1	1	0	0
UCB	30 June	9046	0	0	48	7
UCC	30 June	9045	52	0	60	8
UCD	30 June	9044	27	45	30	15
	Subtotal		149	61	138	30
Northern Region Total			713	373	427	119

Table 8.—Release and recovery information for salmon that were caught in rope trawl hauls using the NOAA ship *John N. Cobb* in two regions of southeastern Alaska, 20 June to 3 July 2005, and that lacked the adipose fin, indicating presence of a coded-wire tag. Agency acronym definitions are: ADFG = Alaska Department of Fish and Game, ARMK = Armstrong Keta Hatchery, DIPAC = Douglas Island Pink and Chum Corporation, NSRAA = Northern Southeast Regional Aquaculture Association, SSRAA =Southern Southeast Regional Aquaculture Association, ODFW = Oregon Department of Fish and Wildlife, WDFW = Washington Department of Fish and Wildlife, and QUIN = Quinault Indian Nation. ND = no data.

Haul num.	Fish num.	Tag code	Agency	Brood year	Release date	Release locality	Release size (g)	Recov date	Recov. station	Recov. size (g)	Recov. size (mm)	Days out
Southern Region												
Chinook (3)												
9019	59	No tag						6/22/05	LCD	133.8	241	
9016	2	No tag						6/21/05	MCC	95.1	195	
9024	11	09:40/45	ODFW	2003	5/4/05	Deschutes R.	9.7	6/23/05	MCC	155.2	240	50
Coho (40)												
9021	1	No tag						6/22/05	LCB	91.7	195	
9021	2	No tag						6/22/05	LCB	142.8	226	
9021	3	No tag						6/22/05	LCB	97.5	198	
9021	4	No tag						6/22/05	LCB	115.6	219	
9021	5	No tag						6/22/05	LCB	84.4	194	
9022	1	09:41/26	ODFW	2003	5/1/05	Big Creek, L. Columbia R.	11.7	6/22/05	LCA	90.9	198	52
9022	2	63:26/82	WDFW	2003	4/15/05	Willapa Bay	151.7	6/22/05	LCA	93.6	192	68
9022	3	No tag						6/22/05	LCA	90.3	195	
9022	4	No tag						6/22/05	LCA	79.7	191	
9022	5	No tag						6/22/05	LCA	109.2	209	
9022	6	21:03/81	QUIN	2003	10/4/04	Clearwater R., Oly. Pen.	57.9	6/22/05	LCA	98.7	203	261
9022	7	No tag						6/22/05	LCA	85.7	197	
9022	8	No tag						6/22/05	LCA	76.1	188	
9022	9	No tag						6/22/05	LCA	104.2	205	
9022	10	No tag						6/22/05	LCA	91.2	202	
9022	11	No tag						6/22/05	LCA	99.5	204	
9027	1	No tag						6/24/05	LCA	78.2	173	

Haul num.	Fish num.	Tag code	Agency	Brood year	Release date	Release locality	Release size (g)	Recov date	Recov. station	Recov. size (g)	Recov. size (mm)	Days out
9028	1	No tag						6/24/05	LCB	99.0	191	
9030	1	No tag						6/24/05	LCD	92.3	201	
9031	2	04:10/83	SSRAA	2003	5/31/05	Neets Bay	29.2	6/25/05	LCD	43.8	161	25
9032	1	No tag						6/25/05	LCC	93.0	202	
9032	2	No tag						6/25/05	LCC	129.3	219	
9032	3	04:10/93	SSRAA	2003	5/22/05	Nakat Inlet	27.5	6/25/05	LCC	71.0	185	34
9032	4	09:41/26	ODFW	2003	5/1/05	Big Creek, L. Columbia R.	11.7	6/25/05	LCC	61.9	187	55
9034	17	No tag						6/25/05	LCA	113.5	211	
9016	9	No tag						6/21/05	MCC	113.8	200	
9016	10	No tag						6/21/05	MCC	99.5	205	
9017	165	No tag						6/21/05	MCB	84.5	201	
9017	166	No tag						6/21/05	MCB	123.8	221	
9017	169	No tag						6/21/05	MCB	95.3	201	
9017	170	No tag						6/21/05	MCB	14.5	113	
9023	1	No tag						6/23/05	MCD	83.6	193	
9023	2	No tag						6/23/05	MCD	86.2	197	
9023	3	No tag						6/23/05	MCD	101.8	201	
9025	2	No tag						6/23/05	MCB	111.0	190	
9025	3	No tag						6/23/05	MCB	86.9	217	
9025	4	No tag						6/23/05	MCB	101.8	214	
9026	187	No tag						6/23/05	MCA	96.0	196	
9026	188	04:10/86	SSRA	2003	5/24/05	Herring Cove	25.1	6/23/05	MCA	51.4	151	30
9026	189	No tag						6/23/05	MCA	79.0	187	
9026	190	No tag						6/23/05	MCA	95.9	193	

Northern Region

Chinook (5)

9042	1	No tag						6/29/05	ISC	231.2	261	
9044	21	04:06/91	NSRAA	2003	6/4/05	Kasnyku Bay	42.0	6/30/05	UCD	94.1	193	26
9044	135	04:07/24	DIPAC	2001	6/12/03	Fish Creek	23.9	6/30/05	UCD	3050.0	615	749
9044	136	04:01/55	DIPAC	1999	6/13/01	Fish Creek	24.3	6/30/05	UCD	8500.0	833	1478
9045	1	03/22/71/16217	NMFS	2003	5/1/05	Little Port Walter	34.0	6/30/05	UCC	238.4	266	60

Haul num.	Fish num.	Tag code	Agency	Brood year	Release date	Release locality	Release size (g)	Recov date	Recov. station	Recov. size (g)	Recov. size (mm)	Days out
Coho (6)												
9042	3	04:11/42	NMFS	2002	5/31/05	Auke Creek	15.0	6/29/05	ISC	116.5	210	29
9049	1	04/1/5/9/7	NRSAA	2003	7/2/04	Indian R., Medvejie	1.5	7/1/05	ISB	103.6	197	364
9036	16	04:08/77	ADFG	2003	5/9/05	Berners R.	ND	6/28/05	UCD	65.6	175	50
9037	1	04:10/34	NSRAA	2003	5/31/05	Kasnyku Bay	21.4	6/28/05	UCC	81.3	194	28
9038	1	04/1/5/8/6	ADFG	2003	5/10/04	Berners R.(wild)	ND	6/28/05	UCB	57.3	167	414
9044	1	04:08/77	ADFG	2003	5/9/05	Berners R.	ND	6/30/05	UCD	56.5	165	52

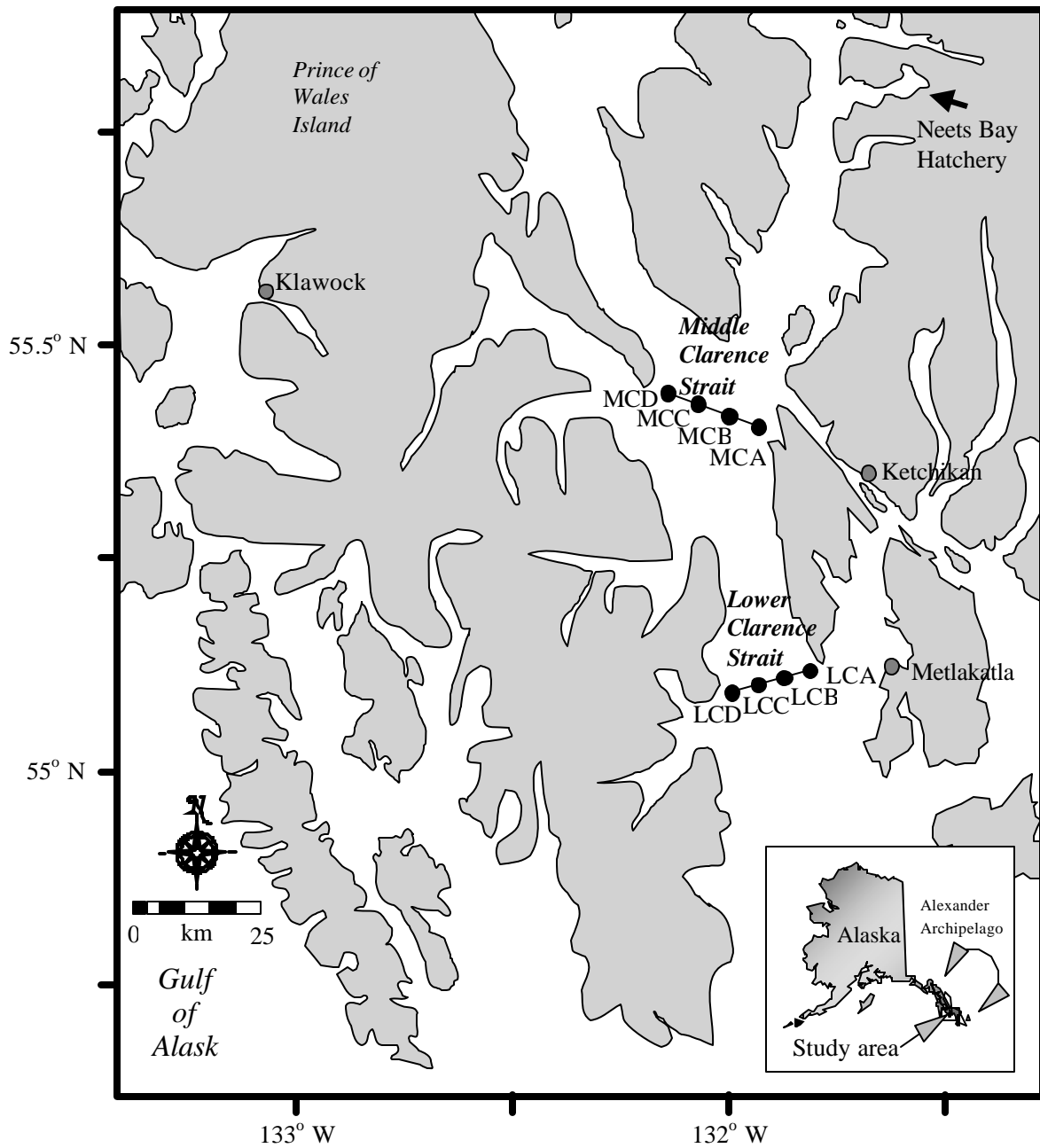


Figure 1. — Lower and Middle Clarence Strait stations sampled June 20-July 3 in marine waters of the southern region of southeastern Alaska, 2005.

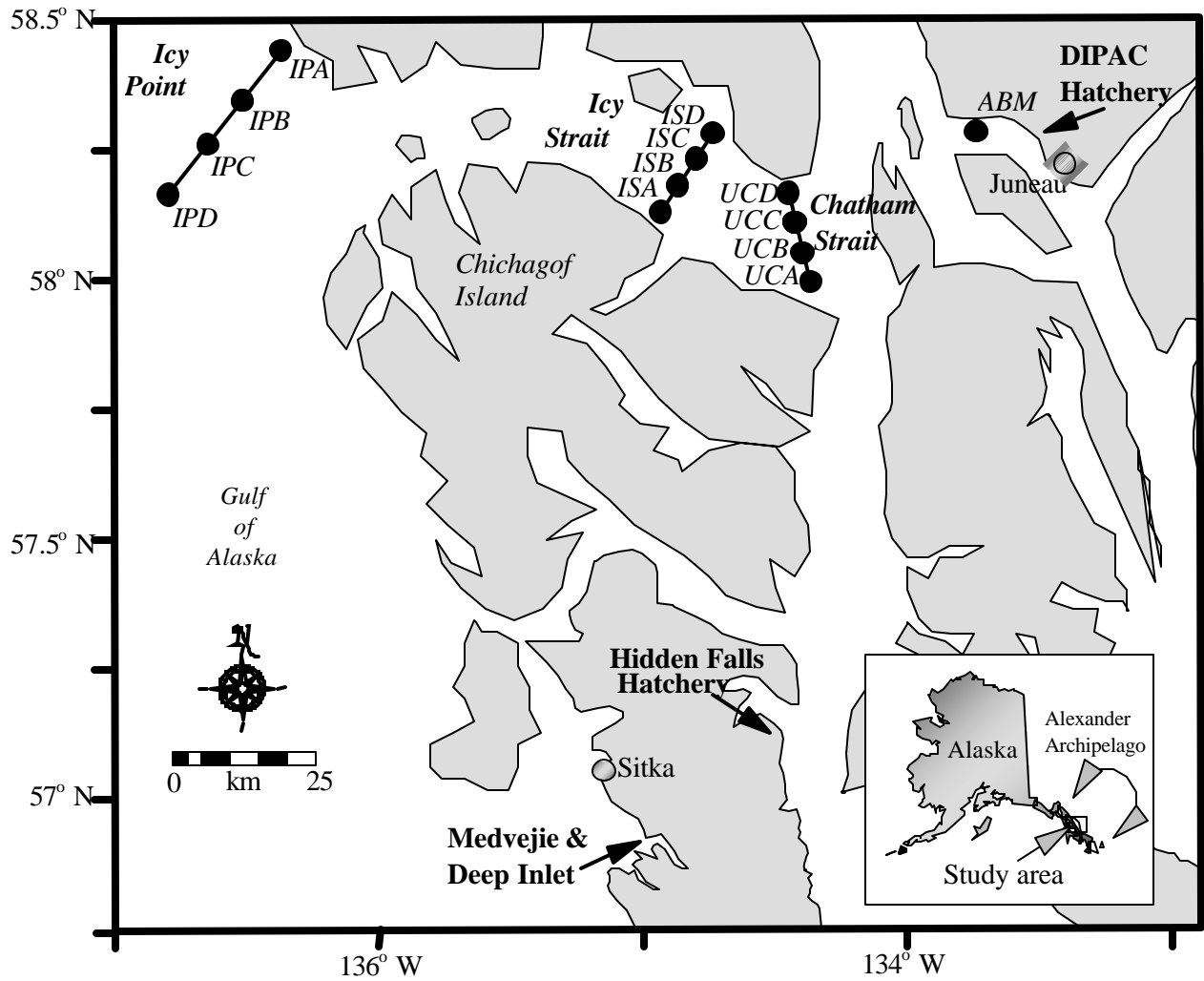


Figure 2.—Icy Strait and Upper Chatham Strait stations sampled from June 20 to July 3 in the marine waters of the northern region of southeastern Alaska, 2005.