NPAFC
Doc. 661
Rev. _____

Southeast Alaska Coastal Monitoring (SECM) Cruise Plan for 2003

by

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Submitted to the

NORTH PACIFIC ANADROMOUS FISH COMMISSION

by the

United States of America

January 2003

THIS DOCUMENT MAY BE CITED IN THE FOLLOWING MANNER:

Heard, W. R., E. A. Fergusson, D.G. Mortensen, J. A. Orsi, M. V. Sturdevant, A.C. Wertheimer, and B. L. Wing. 2003. Southeast Alaska Coastal Monitoring (SECM) Cruise Plan for 2003. (NPAFC Doc. 661) Auke Bay Laboratory, Alaska Fisheries Science Center, National Marine Fisheries Service, NOAA, 11305 Glacier Highway, Juneau, AK 99801-8626, USA. 3 p.

Southeast Alaska Coastal Monitoring (SECM) Cruise Plan for 2003

The Southeast Coastal Monitoring (SECM) project in Alaska was initiated in 1997 by the Auke Bay Laboratory, National Marine Fisheries Service, to study the habitat use and early marine ecology of juvenile (age -.0) Pacific salmon. This SECM research addresses components identified in the National Oceanic and Atmospheric Administration (NOAA) Fisheries Strategic Plan and the North Pacific Anadromous Fisheries Commission (NPAFC) 2001-2005 Science Plan.

The three primary components of the NOAA Fisheries Strategic Plan are to: 1) Rebuild and maintain sustainable fisheries; 2) Promote the recovery of protected species; and 3) Protect and maintain the health of coastal marine habitats. Our research addresses the first component of this plan by emphasizing long term ecological monitoring of coastal marine habitats used by juvenile salmon and the relationship of environmental variability to the sustainability of Pacific salmon resources. The second component is addressed by seasonal sampling, which documented the earliest occurrence of stream-type juvenile chinook salmon stocks from the Columbia River Basin off the Alaska coast; many of these stock groups are protected species. The third component is addressed by describing the essential marine habitat utilized by juvenile salmon as they migrate seaward to the Gulf of Alaska by documenting their spatial and temporal occurrence in relation to biophysical factors.

The NPAFC 2001-2005 Science Plan identifies "juvenile salmon research" as one of three major focuses of Cooperative NPAFC Science Activities. Research issues within this NPAFC juvenile salmon research component include: seasonal distribution and migration, population size and survival estimates, trophic linkages and growth changes, and primary production and food resources. Our SECM research is closely aligned with these issues. The NPAFC Plan requires long-term ecological monitoring projects like SECM to study key juvenile salmon stocks, in several regions of the North Pacific Rim, encompassing a variety of environmental conditions to understand the relationships of habitat use, marine growth, hatchery-wild stock interactions, year-class strength, and ocean carrying capacity.

From 1997–2000, SECM sampled biophysical parameters in inshore, strait, and coastal habitats along a primary seaward migration corridor used by juvenile salmon in the northern region of Southeast Alaska. Up to 24 stations spanning 250 km were sampled five times annually, May to October. These habitats extended geographically from inshore localities near large glacial rivers to 65 km offshore in the Gulf of Alaska. Fish were sampled diurnally with a NORDIC 264 surface rope trawl from the NOAA ship *John. N. Cobb*. Biophysical data collected included: profile data of water temperature and salinity, surface nutrients and chlorophyll, zooplankton from vertical 20 m hauls and double oblique hauls deployed to 200 m depth, and onboard stomach analysis of potential predators of juvenile salmon.

In 2001-2002, SECM research maintained biophysical sampling at 13 core stations and directed more research effort into process studies (Tables 1-2, Fig. 1). Two such studies initiated in 2001 included diel feeding periodicity and prey fields of salmon, and onboard gastric evacuation rate experiments of pink and chum salmon. These process studies will enable more accurate input parameters to be used with bioenergetic models to evaluate salmon habitat quality (growth potential) and coastal marine carrying capacity. In 2002, sampling was curtailed after late August because juvenile salmon abundances are low in September, and sampling time intervals were increased in earlier months to maximize the opportunities for obtaining data at offshore stations and to replicate trawling at the core stations.

For 2003, sampling frequency at the 13 core stations was increased from four to six, between mid-May and late-August to gain better temporal resolution of biophysical factors related to salmon growth and abundance. Additionally, concurrent inshore sampling was added in two periods using a second trawl gear type to examine inshore spatial distribution and compare size-selectivity of the two trawl types for juvenile salmon. Sea lice infestation on juvenile salmon will also be noted.

Table 1. Localities and coordinates of stations sampled monthly in marine waters of the northern region of southeastern Alaska, May–August 2003.

Locality	Station	Latitude	Longitude	Offshore distance (km)	Bottom depth (m)
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
Icy Point	IPA	58° 20.12′N	137° 07.16′W	6.9	160
Icy Point	IPB	58° 12.71′N	137° 16.96′W	23.4	130
Icy Point	IPC	58° 05.28′N	137° 26.75′W	40.2	150
Icy Point	IPD	57° 53.50′N	137° 42.60′W	65.0	1300