

## AFSC/ABL: Survey of juvenile salmon and associated epipelagic ichthyofauna in the marine waters of Southeast Alaska

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From 1997 to 2000, Southeast Coastal Monitoring Project research was directed at sampling juvenile salmon and their associated biophysical parameters in inshore, strait, and coastal habitats along a primary seaward migration corridor in the northern region of Southeast Alaska. Up to 24 stations spanning 250 km were sampled five times annually, from 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. The biophysical data collected included vertical profile data on 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 2001-2004, SECM researchers continued biophysical sampling at 13 core stations and directed more research effort into process studies. Two such studies initiated in 2001 included diel feeding periodicity and prey fields of juvenile salmon, and onboard gastric evacuation rate experiments for juvenile pink and chum salmon. These process studies will enable more accurate input parameters to be used with bioenergetic models to evaluate coastal marine carrying capacity and salmon habitat quality (growth potential). Beginning in 2002, sampling was curtailed after late August because consistently low juvenile salmon abundances had been documented for September; 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. In 2003, sampling frequency at the 13 core stations was increased from four to six time intervals, 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 to compare size-selectivity of the two trawl types for juvenile salmon. Sea lice infestation on juvenile salmon was also recorded. In 2004, the SECM sampling effort expanded inshore to support collaboration with a Taku Inlet Chum Salmon Study funded under the Southeast Sustainable Salmon Fund. This study will examine hatchery- and wild-stock interactions of juvenile chum salmon in the Taku River estuary. The Taku Inlet Chum Salmon Study sampled littoral habitats, while SECM sampling focused on coincident sampling in neritic habitats in the vicinity of Taku Inlet and seaward.

In 2005-2007, SECM sampled the 13 core stations during four intervals from late May to late August, and extended sampling in June and July to Clarence Strait in the southern region of southeastern Alaska. Sampling in the southern region provided additional information on juvenile salmon and associated biophysical parameters in both marine environments to broaden basic understanding of the trophic relationships and ecological interactions of wild and hatchery juvenile salmon and associated fishes. This expanded project, funded in part by the Northern Fund of the Pacific Salmon Commission (PSC), has four specific objectives: 1) evaluating regional concordance in relative abundance and growth of juvenile pink and chum salmon in northern and southern regions of

southeastern Alaska, 2) estimating daily prey consumption rates of juvenile pink salmon with a bioenergetics model to determine proportion of zooplankton standing crop consumed, 3) comparing total prey consumption of juvenile pink salmon to total prey consumption of wild and hatchery juvenile chum salmon in northern and southern regions of southeastern Alaska, and 4) forecasting pink salmon abundance in southeastern Alaska from juvenile salmon catches and associated biophysical parameters.

In 2008, SECM research was conducted in the northern region only due to the loss of the NOAA vessel John N. Cobb. Charter vessels were used to complete trawling June - August.

In 2009, SECM research was conducted in the northern region in May and June aboard the NOAA small boat R/V Sashin. Oceanographic sampling was completed at all 13 core stations. In July, sampling was conducted in the northern and southern regions aboard the F/V Chellissa. Oceanographic and trawl sampling was completed at all 13 core stations in the northern region and at all 8 stations in the southern region. In August, sampling was again conducted aboard the F/V Chellissa. Oceanographic and trawl sampling was completed at all 13 core stations in the northern region.