Overview of Current Marine Juvenile Salmon Research by the United States

John H. Helle[1], Lisa B. Eisner[1], Edward V. Farley, Jr.[1], Ellen C. Martinson[1], Angela Middleton[1], Jamal H. Moss[1], James M. Murphy[1], Joseph A. Orsi[1], John Pohl[1], Molly V. Sturdevant[1], Alex C. Wertheimer[1], Bruce L. Wing[1], Richard D. Brodeur[2], Robert Emmett[2], Cynthia Bucher[2], Bruce MacFarlane[3], Jeff Harding[3], Arnold Ammann[3], and **Christian E. Zimmerman[4]**

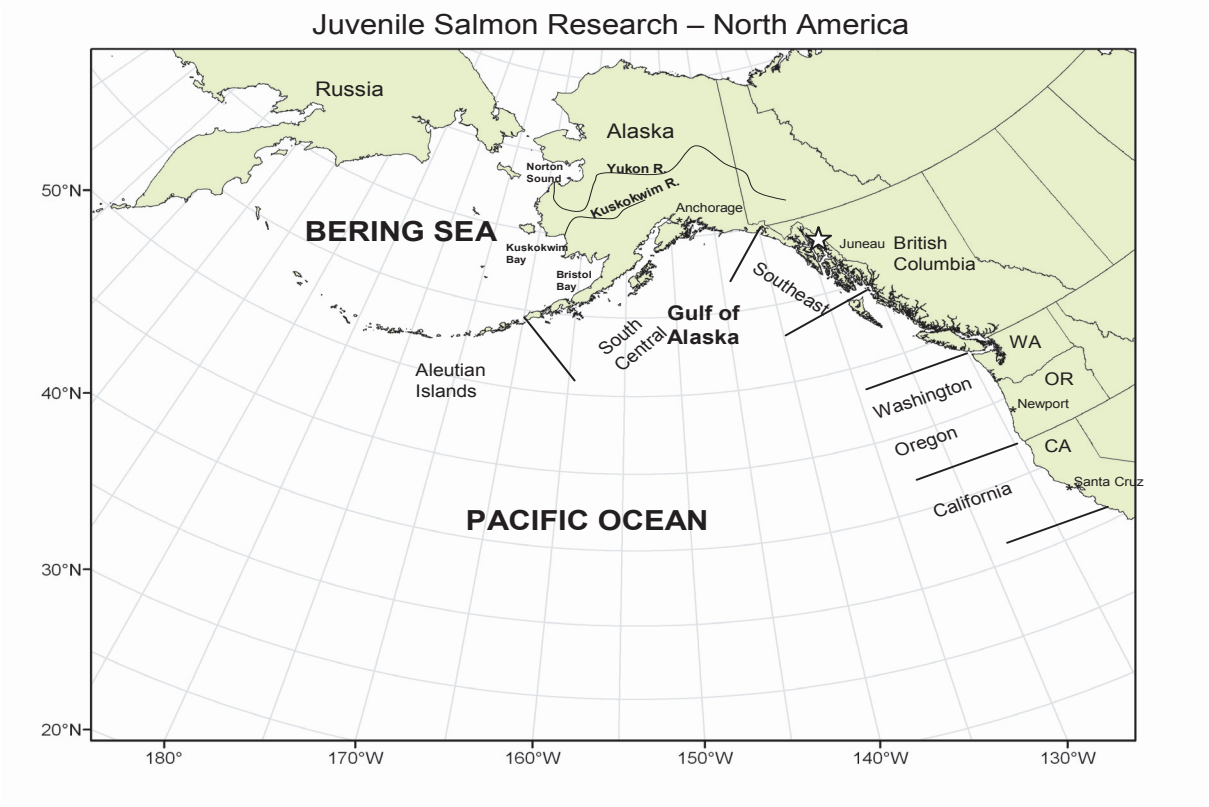
[1]*U.S. Department of Commerce, NOAA, NMFS, Alaska Fisheries Science Center, Auke Bay Laboratory, 11305 Glacier Highway, Juneau, Alaska 99801, USA*
[2]*U.S. Department of Commerce, NOAA, NMFS, Northwest Fisheries Science Center, 2032 S.E. OSU Drive, Newport, Oregon 97365-5275, USA*
[3]*U.S. Department of Commerce, NOAA, NMFS, Southwest Fisheries Science Center, 110 Shaffer Road, Santa Cruz, California 95060 USA*
[4]*U.S. Geological Survey, Alaska Science Center, 4230 University Drive, Anchorage, Alaska 99509-4650 USA*

Keywords: Juvenile Pacific salmon, migration, distribution, growth, survival, marine ecosystems, USA

A history of juvenile salmon research on Pacific salmon in coastal areas conducted by the United States (U.S.) was published by Brodeur et al. (2003). Presently, juvenile Pacific salmon research in the U.S. occurs in the coastal areas of all of the Pacific states: California, Oregon, Washington, and Alaska (Fig. 1). Major objectives of this research are to understand how dynamics in marine ecosystems influence migration, distribution, growth, and survival of juvenile salmon during their early ocean residence.

Several large-scale studies in coastal areas from California to Alaska are currently being conducted by the National Oceanic and Atmospheric Administration (NOAA), National Marine Fisheries Service (NMFS), in collaboration with university and state scientists. Studies off California are operated by the Southwest Fisheries Science Center, Santa Cruz Laboratory in Santa Cruz, California and University of California Santa Cruz. Studies off Oregon and Washington are operated by the Northwest Fisheries Science Center, Newport Laboratory and

Fig. 1. Locations of marine juvenile salmon research in North America.



All correspondence should be addressed to J. Helle.
e-mail: jack.helle@noaa.gov

© 2007 North Pacific Anadromous Fish Commission

Oregon State University in Newport, Oregon. Studies in the Gulf of Alaska, Bering Sea and in the seaward migration corridors in the coastal waters of southeastern Alaska are operated by the Alaska Fisheries Science Center, Auke Bay Laboratory in Juneau, Alaska, in collaboration with Alaska Department of Fish and Game, University of Alaska Fairbanks, Bering Sea Fishermen's Association, and Yukon River Drainage Fishermen's Association. In addition to these large studies, smaller estuarine studies on juvenile salmon occur in northwestern Alaska in Kuskokwim Bay by the U.S. Geological Survey (Anchorage) and University of Alaska Fairbanks (Juneau), and, in Norton Sound by LGL Alaska Research Associates and Norton Sound Economic Development Corporation both headquartered in Anchorage (Fig. 1).

The estuarine studies on juvenile salmon in Alaska operate in shallow water and a variety of gear is used to capture salmon. A small trawl towed by two boats is used in Kuskokwim Bay. Fyke nets are utilized in Norton Sound to capture salmon.

The primary gear for capturing juvenile salmon at sea in the larger studies is a trawl towed near the surface. Studies in the Bering Sea and Gulf of Alaska utilize a larger trawl than the other studies. In the coastal studies, the trawls are towed perpendicular to the shore across four habitat types: near-shore, continental shelf, slope of the continental shelf, and oceanic water. Juvenile salmon migrate primarily along the continental shelf during their early life history. Studies in southeastern Alaska occur mainly in the channels and fjords protected by islands from the open ocean.

A variety of oceanographic observations are made from the vessels to support the juvenile salmon research. In addition, studies are underway on food habits, predator/prey relations, growth, bioenergetics and genetic stock identification of juvenile salmon.

REFERENCE

Brodeur, R.D., K.W. Myers, and J.H. Helle. 2003. Research conducted by the United States on the early ocean life history of Pacific salmon. N. Pac. Anadr. Fish Comm. Bull. 3: 89–131.