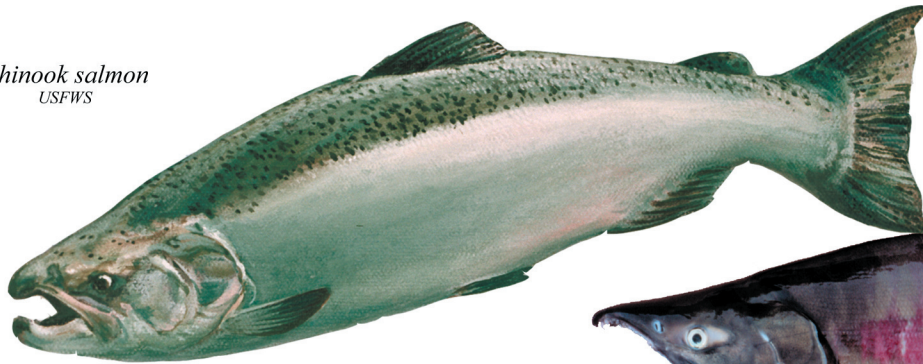




# Contaminants in Salmon

## *Alaska Region*

Chinook salmon  
USFWS



Chum salmon  
Randy Brown/USFWS



### Background and Objectives

Fisheries and subsistence managers need to determine if contaminants are a threat to the health and viability of Alaska salmon populations, and many Alaskans are concerned about the quality of subsistence foods. To address these concerns for salmon fisheries, the U.S. Fish and Wildlife Service (FWS) measured contaminants and their effects in Chinook salmon (*Oncorhynchus tshawytscha*) and chum salmon (*O. keta*) from the Yukon and Kuskokwim rivers. We collected fish in 2001 and analyzed samples and data in 2002 and 2003. Our objectives were to document contaminant levels and effects in salmon, particularly on health and viability of salmon populations, and to provide our data to public health agencies for evaluation of whether salmon from the Yukon and Kuskokwim Rivers were safe to eat.

### Sampling and Analyses

We sampled male and female Chinook and chum salmon from The Rapids (upstream of Tanana) and Beaver on the Yukon River, and from Bethel on the Kuskokwim River. Males and females were analyzed separately because differences in contaminants can occur between genders. Yukon River sampling sites were located upriver of the Tanana to reduce the number of stocks sampled, and therefore the variation among them. In this way, we were able to use a smaller number of samples and keep

costs down. Also, upriver spawners have more fat than downriver spawners. Since many contaminants are found in fat, contaminant concentrations in each fish are affected by the amount of fat. It is likely that upriver spawners represent the “worst-case” contaminants scenario in salmon from the Yukon River.

We sampled a variety of tissues, including skinless fillets, for heavy metals and persistent organic pollutants (POPs) such as the pesticide DDT and polychlorinated biphenyls (PCBs). We also measured fish health indicators, including histology, reproductive hormones, enzyme levels, vitamins, sex chromosome or gender abnormalities, and we conducted internal and external exams.

### Fish Health

We found relatively low concentrations of both metal and organochlorine contaminants in Chinook and chum salmon from both rivers. In general, all contaminant concentrations were below those thought to affect fish health and reproduction, and other indicators of fish health were normal.

### Public Health

The FWS, in coordination with other agencies, is responsible for maintaining fish and wildlife populations used for subsistence. Public health agencies, on the other hand, are better equipped to provide guidance on consumption of subsistence foods and their effects on

human health. We provided our data to the Alaska Native Tribal Health Consortium and the Alaska Division of Health and Social Services, Section of Epidemiology, for their evaluation of potential impacts of salmon consumption to human health. These departments concluded that the contaminant concentrations we measured in Yukon and Kuskokwim salmon were low, consistent with other Alaska salmon studies, and not a public health risk. They said, “These findings support current Alaska public health dietary recommendations that all Alaskans, including pregnant women, women who are breast-feeding, women of childbearing age, and young children continue unrestricted consumption of fish from Alaskan waters.” More information for this state program can be found at: [www.epi.alaska.gov/eh/default.stm](http://www.epi.alaska.gov/eh/default.stm).

### Outreach and Communication

We have presented these data at several meetings in Alaska, such as the 2004 Alaska Forum on the Environment, and we are returning to the communities near our sampling locations to present this information to local residents. Paper copies are available upon request by phone, fax, email, or letter. A journal article will be submitted for publication by December, 2004, and our data will be provided upon request. To have your name added to our mailing list, or to receive other information about this project, please contact Keith Mueller or

Angela Matz (see contact information below).

### Cooperators

We'd like to thank the people who helped with this project, including: the Bethel Boys Group Home, Alaska Department of Fish and Game's Bethel Test Fisheries Personnel, and Dave Cannon in Bethel; Paul, Lois, Michael, Joe, and Ethan Williams, Billy and Mildred Killbear, Cliff Adams, Jerry and Carol Thomas, and Wayne Pitka in Beaver; Stan Zuray, Kathleen Peters-Zuray, and subsistence fishermen in Tanana and at The Rapids; and Tim Obritschkewitsch in Fairbanks. We also thank the Alaska Department of Fish

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*Approximate salmon sampling locations from left to right—Bethel, the Rapids, and Beaver.*

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Visit the Contaminant Program home page:  
<http://alaska.fws.gov/fisheries/contaminants/index.htm>

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