

Effects of *Ichthyophonus* on survival and reproductive success of Yukon River Chinook salmon.

**Abstract** When king salmon enter the Yukon River on their spawning migration in mid June, over 25% of the population are infected with *Ichthyophonus*. The percent of infected fish remains relatively constant until the fish pass river mile 1,319 at Dawson, Y.T., then it drops to 13% when they reach river mile 1,745 at Whitehorse, Y.T. When the sexes are examined separately, slightly more females are infected than males (29% vs 22%). The percent of fish exhibiting clinical signs (diseased) is 2-3% when they enter the river, but increases to over 20% at river mile 715 near Tanana, AK. Disease prevalence within the population remains constant at > 20% until fish pass Dawson, then the percent of diseased fish drops to < 9% at Whitehorse. When the sexes are examined separately, male disease prevalence is highest at Tanana (22.6%) then gradually drops to just 12.9% at Whitehorse. Females however, continue to show an increase in disease prevalence peaking at river mile 1,081 near Circle, AK, at 36.4%, then dropping to just 5.3% at Whitehorse. Data on infection and disease collected from kings at Nenana on the Tanana River more closely resembles that seen at Whitehorse than the lower and middle Yukon River. When data collected in 1999 and 2000 are compared the prevalence of infection in males remains the same while a 15% drop in infection prevalence occurs in females. There is also a drop in the percent of infected fish showing *Ichthyophonus* infection of the muscle. This difference may be related to a 2oC lower river temperature in 2000 compared with 1999. Significant egg resorption was seen in 25% of females but no correlation with *Ichthyophonus* infection could be made. The cause of resorption and the extent to which it affects fecundity has yet to be determined. Attempts to experimentally infect Chinook salmon and rainbow trout with Yukon River *Ichthyophonus* isolates were essentially unsuccessful by both feeding of infected tissues and injection of cultured spores. However, other unrelated fish species were infected without difficulty. A method for non-lethal sampling of adult spawning Chinook salmon for *Ichthyophonus* was developed using known infected fish and live returning spawners. The method consisted of taking punch biopsies of skin and muscle and culturing the biopsy tissue in vitro. A 100% correlation was made between known infected fish and cultured biopsy tissue.

Kocan, R., P. Hershberger, and J. Winton. 2000. Effects of *Ichthyophonus* on survival and reproductive success of Yukon River Chinook salmon. U. S. Fish and Wildlife Service, Office of Subsistence Management, Fisheries Resource Monitoring Program, Final Report (Study No.00-030). School of Aquatic & Fishery Sciences, Seattle, Washington.