

## **Stock composition, run timing, and movement patterns of Chinook salmon returning to the Yukon River Basin in 2003**

A radio telemetry study was conducted on Yukon River Chinook salmon (*Oncorhynchus tshawytscha*) during 2003 to provide information on stock composition and run timing, migration patterns, and locations of important spawning areas. A total of 1,097 fish were radio tagged in the lower Yukon River near the village of Russian Mission.

After tagging, most (1,081; 98.5%) fish resumed upriver movements, with 271 fish harvested in fisheries and 810 fish tracked to upriver areas using remote tracking stations and aerial surveys. Stock composition estimates were developed for the return based on the distribution of daily releases of radio-tagged fish weighted by daily measures of abundance and adjusted for fish harvested in fisheries.

The Chinook salmon run was composed primarily of Tanana River (18.9%) and upper basin (67.2%) stocks. Canadian-origin fish comprised the largest component of the return (55.4%), with most traveling to reaches of the Yukon River (51.5%) and only small numbers to the Porcupine River (3.9%). Yukon River fish in Canada returned to headwater tributaries (42.2%), including the Stewart, Pelly, Big Salmon, and Teslin rivers (32.2%) and reaches associated with the Yukon River main stem (9.3%). Chandalar and Sheenjek River fish (6.5%) were the principle U.S. stocks in the upper basin. Tanana River stocks were predominantly Chena, Salcha, and Goodpaster River fish (15.3%), with small populations located in other tributaries. Middle basin fish traveling to the Koyukuk, Melozitna, Nowitna, and Tozitna rivers were a minor component of the run (4.0%).

Stocks returning to lower basin tributaries (4.6%) were primarily Anvik and Nulato River fish (3.9%). The two major stock groups, Canadian Yukon River and Tanana River fish, exhibited similar run timing with most fish passing through the lower river in mid-June, although several distinct pulses were also observed in early June and late June-early July. In Canada, Chinook salmon returning to the Klondike River were primarily early-run fish, while upper headwater stocks displayed a later and more protracted run timing. Lower basin stocks consisted primarily of late-run fish.

Movement rates for radio-tagged fish averaged 50.9 km/day, although regional differences were observed. Middle and upper basin fish traveled an average of 48.0 km/day and 54.7 km/day, respectively. However, these stocks exhibited comparable movement rates in reaches of the Yukon River main stem, while slower swimming speeds were recorded as the fish approached their natal streams. Movement rates for lower basin stocks were substantially less, averaging 31.2 km/day, possibly due to the shorter distances traveled to reach their spawning areas.

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