AFSC/ABL: Stock composition, timing, and spawning distribution of Yukon River Chinook salmon

John Eiler

A radio telemetry study was conducted on Yukon River Chinook salmon (Oncorhynchus tshawytscha) during 2002-2004 to provide information on stock composition and run timing, and locations of important spawning areas. During 2002, 768 adult Chinook salmon returning to the basin to spawn were radio tagged in the lower Yukon River near the villages of Marshall and Russian Mission. Most (751, 97.8%) fish resumed upriver movements, with 270 fish harvested in fisheries and 481 fish tracked to upriver areas using remote tracking stations and aerial surveys. Stock composition estimates were developed for the 2002 chinook salmon return based on the distribution of daily releases of radio-tagged fish weighted for abundance and adjusted for fish harvested in fisheries. The chinook salmon run was composed primarily of Tanana River (20.9%) and upper basin (66.0%) stocks. Canadian-origin fish comprised the largest component of the return (53.4%), with most traveling to reaches of the Yukon River (50.7%) and only small numbers to the Porcupine River (2.7%). Canadian fish in the Yukon River returned to large headwater tributaries (35.5%), small tributaries associated with the main river (4.6%) and reaches of the Yukon River main stem (10.6%). Chandalar River and Sheenjek River fish (5.9%) were important U.S. stocks in the upper basin. Tanana River fish were predominantly Chena River, Salcha River, and Goodpaster River stocks (18.8%), 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 (3.1%). Fish returning to lower basin tributaries (6.3%) were comprised primarily of Anvik River and Nulato River fish (4.8%). The two major stock groups, Canadian Yukon River and Tanana River fish, exhibited similar run timing with most fish passing through the lower river during the early and middle runs, although differences within regions were observed. In Canada, chinook salmon returning to the Klondike, Stewart, and White rivers 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, although other stocks, particularly Canadian Yukon River fish, were also present during this period. During 2003, 1,097 fish were radio tagged in the lower Yukon River near the village of Russian Mission. 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. During 2004, 995 fish were radio tagged in the lower Yukon River near the village of Russian Mission. Most (958, 96.3%) fish resumed upriver movements, with 329 fish harvested in fisheries and 629 fish tracked to upriver areas using remote tracking stations and aerial surveys. Stock composition estimates were developed for the 2004 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 (24.4%) and upper basin (55.2%) stocks. Canadian-origin fish comprised a substantial proportion of the return (47.5%), with most traveling to reaches of the Yukon River (46.2%) and only small numbers to the Porcupine River (1.3%). Yukon River fish in Canada returned to large headwater tributaries including the Stewart, Pelly, Big Salmon, and Teslin rivers (27.3%), small tributaries associated with the main river (8.2%), and reaches of the Yukon River main stem (10.7%). Chandalar and Sheenjek River fish (2.9%) were the principle U.S. stocks in the upper basin. Tanana River fish were predominantly Chena, Salcha, and Goodpaster River stocks (17.9%), 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 (5.5%). Stocks returning to lower basin tributaries (7.6%) were primarily Bonasila, Anvik, and Nulato River fish (7.1%). 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, upper headwater stocks displayed a later and more protracted run timing. Lower basin stocks consisted primarily of late run fish, although other stocks, particularly Canadian Yukon River fish, were also present during this period.