

## **Population monitoring of Lake Clark and Tazimina River sockeye salmon, Kvichak River Watershed, Bristol Bay, Alaska, 2000-2003.**

**Abstract:** Sockeye salmon originating from the Kvichak River watershed historically dominated valuable subsistence, sport and commercial fisheries in Bristol Bay, Alaska. In 1996 salmon runs to western Alaska declined and the Kvichak River sockeye salmon escapement average dropped from 5.7 million fish during 1955–1995 to 2.1 million fish during 1996–2003. This decline concerned fishers and resource managers and led to this study examining status and trends of two important component stocks that spawn in Lake Clark and the Tazimina River. Lake Clark escapement estimates were made at river kilometer 36 of the Newhalen River using the same tower site and protocols used during 1980–1984. Tazimina River escapement estimates were made within the first kilometer of the river mouth during 2001–2003, but tower sites changed slightly from year to year to reduce problems due to flooding and fish movement patterns. Average escapement to Lake Clark during 2000–2003 was 215,922 sockeye salmon, about 81% less than the average escapement during 1980–1984 (1,135,464 sockeye salmon). Lake Clark escapement during 2000–2003 comprised, on average, 19% of the total Kvichak escapement, about 3% more than observed during the 1980–1984 study. Tazimina River escapement estimates during 2001–2003 averaged 12,193 sockeye salmon, which was about 78% less than the average peak aerial escapement indices made during 1955–2000 (55,000 sockeye salmon). Sockeye salmon ages were determined from otoliths (ear bones) collected from Newhalen River subsistence gillnet harvests and from seine sampling. Overall trends in age composition were generally similar among Lake Clark, Tazimina, and Kvichak River sockeye salmon samples. Age-1.3 was the most abundant age class in both samples during 2001, while age-1.2 was the most abundant during 2002 and 2003. However, distribution of age classes in samples from these two locations differed significantly (all chi square tests;  $p < 0.05$ ) each year. Neither Tazimina nor Newhalen River samples had either age-0. or -.1 sockeye salmon in any year. Lake Clark sockeye salmon were generally larger at age when compared to Kvichak River sockeye salmon, while Tazimina were generally smaller at age. Continued monitoring of Lake Clark sockeye salmon escapement, age, and size is recommended because the data can provide a broader understanding of population dynamics within the Kvichak River watershed. Such information is needed to assess the factors influencing variation in production from the system.

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