

## Tumakof Lake (Redfish Bay) subsistence sockeye salmon project

Abstract: From 2002 to 2004, we estimated sockeye escapement into Tumakof Lake by counting through a weir and using mark-recapture methods to verify the sockeye weir counts. We also estimated the number of sockeye salmon (*Oncorhynchus nerka*) harvested in the subsistence and sport fisheries at the head of Redfish Bay, and we collected baseline information on the freshwater habitat of sockeye juveniles (2002 and 2003 only). In all three years (2002–2004), the weir count was lower than the mark-recapture estimate by 18 to 29%, presumably because fish passed through the weir undetected. Using mark-recapture methods, we estimated an escapement into Tumakof Lake of 49,000 sockeye salmon in 2004, a decline from the escapement of 58,000 fish in 2003, but an increase from the escapement of 34,000 fish in 2002. In 2004, sport and subsistence fishers harvested 1,200 sockeye salmon. Similar to 2002 and 2003, the 2004 harvest was only 2% of the total number of sockeye adults returning to the marine terminal area of Redfish Bay. Therefore, the current level of subsistence and sport harvests in Redfish Bay do not appear to be high enough to appreciably limit future sockeye recruitment in Tumakof Lake. In 2002 and 2003, we observed very low levels of *Daphnia longiremis*, the preferred zooplankton prey of sockeye fry, which suggests that the predation pressure was high from sockeye fry and other planktivores. Consequently, we believe this system may be approaching carrying capacity due to food limitations.

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