ABSTRACT

For at least 1,000 years, the Kanalku Lake sockeye salmon (*Oncorhynchus nerka*) stock has provided for an important traditional Tlingit fishery for the residents of Angoon, Alaska. Due in part to its proximity to the village, residents have long depended on Kanalku Lake salmon runs, and it is their preferred source of subsistence sockeye salmon. Recent concerns about the sustainability of the stock prompted the establishment of an assessment program beginning in 2001. Mark-recapture studies were conducted to estimate the escapement in Kanalku Lake between 2001 and 2006, and a weir was implemented in 2007 to increase confidence in the estimates and observe the run timing. The weir count of 967 adult sockeye salmon in 2008 was lower than the weir-to-spawning-grounds mark-recapture estimate of 1,200 fish (95% confidence interval 1,000-1,500). The mark-recapture estimate was accepted as the best estimate of the total escapement into Kanalku Lake in 2008 because it met our pre-defined statistical criteria. In 2002, local residents and ADF&G agreed upon a voluntary reduction of subsistence harvest of sockeye salmon to help stocks rebuild. In 2006 and 2007, a traditional subsistence fishery for sockeye salmon in Kanalku Bay was opened under a shortened season. 2008 marked the return of traditional subsistence sockeye fishing at Kanalku Bay with a reported harvest of about 700 sockeye salmon by over 40 permit holders. In 2008, over 95% of the returning adults were estimated to be in a single age class, age 1.2. This result was indicative of a very weak return of age-1.3 fish from the 2003 brood year. Water temperature, euphotic zone depth, and zooplankton populations in Kanalku Lake appear to be adequate for good sockeye fry production 2008.

Key words: sockeye salmon, *Oncorhynchus nerka*, subsistence, Kanalku Lake, escapement, weir, mark-recapture, age composition, limnology, zooplankton, Southeast Alaska.