

## Stock assessment and restoration of the Afognak Lake sockeye salmon run, 2007

### Abstract

Beginning in 2001 the Afognak Lake sockeye salmon *Oncorhynchus nerka* runs substantially declined. Concerns expressed by local subsistence users to the Alaska Department of Fish and Game and the US Fish and Wildlife Service Office of Subsistence Management prompted a seasonal investigation of the lake's rearing environment beginning in 2003, which has continued until the present. This report provides the 2007 fishery and limnology results from the Afognak Lake study and fulfills annual reporting requirements to the US Fish and Wildlife Service Office of Subsistence Management, the funding agent for this project (project 07-401). During 2007, 55,315 sockeye salmon smolt were captured using a Canadian fan trap operated from 10 May to 4 July. Using mark-recapture techniques, we estimated that 275,450 sockeye salmon smolt (95% CI 240,388 – 310,512) emigrated from Afognak Lake. The population was composed of 237,383 age-1. and 38,067 age-2. smolt. Age-1. smolt had a mean weight of 2.6 g, a mean length of 70.4 mm, and a mean condition factor of 0.75. Age-2. smolt had a mean weight of 3.4 g, a mean length of 76.5 mm, and a mean condition factor of 0.74. Five limnology surveys were conducted in Afognak Lake from May to September, 2007. Seasonal physical conditions and water chemistry values were generally consistent with historical data collected from Afognak Lake: however phosphorus concentrations in 2007 were the lowest recorded levels of phosphorus in Afognak Lake. Seasonal zooplankton density averaged 112,480 animals per m<sup>2</sup>, and cladocerans comprised 64.2% of the zooplankton sampled. The cladoceran *Bosmina* was the most abundant zooplankter, while *Epischura* was the most abundant copepod.

**Citation:** Baer, R. T., S. T. Schrof, M. B. Foster, and S. G. Honnold. 2009. Stock assessment and restoration of the Afognak Lake sockeye salmon run, 2007. U.S. Fish and Wildlife Service, Office of Subsistence Management, Fisheries Resource Monitoring Program, Annual Report (Study No. 07-401). Alaska Department of Fish and Game, Division of Commercial Fisheries, Fisheries Data Series Report 09-17, Anchorage, Alaska.