

Thoms, Salmon Bay and Luck Lake sockeye salmon (*Oncorhynchus nerka*) stock assessment project

Abstract: Sockeye salmon (*Oncorhynchus nerka*) returning to Thoms, Salmon Bay, and Luck lakes are an important subsistence resource for the people of Wrangell and Prince of Wales Island. The Thoms, Salmon Bay, and Luck Lakes sockeye salmon stock assessment project was initiated because of concerns about the potential increase in harvest of sockeye salmon returning to these lake systems. The project evaluates sockeye salmon production at various life stages and assesses lake productivity. This annual report summarizes work conducted during the first year of project operations, 2001.

In Thoms Lake, a hydroacoustic survey estimated a sockeye fry density of 0.89 fry per m² and a total lake population of 914,000 fry. Ninety percent of the sockeye salmon fry captured in the mid-water trawl were age -0 and 10% were age -1 fry. Sockeye salmon fry comprised 97% of the mid-water trawl sample and the remaining 3% were sticklebacks. A mark recapture study of the spawning population estimated the minimum sockeye salmon escapement at 3,000 fish. Thoms Lake had a seasonal mean zooplankton density of 105,000 plankters per m² and a season mean weighted biomass of 142 mg per m². The seasonal mean euphotic zone depth was 3 m.

In Salmon Bay Lake, a hydroacoustic survey estimated a sockeye fry density of 0.72 fry per m² and a total lake population of 221,000 sockeye salmon fry. All the sockeye salmon fry captured in the mid-water trawl were age -0. Sockeye salmon fry comprised 93% of the mid-water trawl sample and the remaining 7% were sticklebacks. A mark recapture study of the spawning population estimated the minimum sockeye salmon escapement at 20,800 fish. Salmon Bay Lake had a seasonal mean zooplankton density of 162,000 plankters per m² and a seasonal mean weighted biomass of 347 mg per m². The seasonal mean euphotic zone depth was 4.6 m.

In Luck, a hydroacoustic survey estimated a sockeye fry density of 0.10 fry per m² and a total lake population of 19,000 sockeye salmon fry. All the sockeye salmon fry captured in the mid-water trawl were age -0. Sockeye salmon fry comprised 80% of the mid-water trawl sample and the remaining 20% were sticklebacks. A mark recapture study of the spawning population estimated the minimum sockeye salmon escapement at 7,900 (range=6,700-9,000, 95% CI) fish. Luck Lake had a seasonal mean zooplankton density of 115,000 plankters per m² and a seasonal mean weighted biomass of 233 mg per m². The seasonal mean euphotic zone depth was 4.6 m.

This year's results provide the foundation for a multiple-year study to assess the health of the sockeye salmon stocks in Thoms, Salmon Bay, and Luck lakes and to set a range of escapement goals capable of sustaining these populations for many generations.

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