

## **Estimation of Coho Salmon Abundance and Spawning Distribution in the Unalakleet River, 2005.**

**Abstract:** The Unalakleet River supports the largest and arguably most important coho salmon run in Norton Sound. To monitor salmon escapement in the Unalakleet River drainage, a counting tower has been in operation for several years on the North River, a large tributary. A 3-year investigation was initiated in 2004 to describe the extent to which the North River tower counts index escapement of coho salmon into the entire Unalakleet River drainage. This report describes results from 2005, the second year of the study.

Between July 20 and September 16, 2005, 287 coho salmon were captured with beach seines in the lower portion of the Unalakleet River and fitted with esophageal radio tags. Final spawning destinations of radio-tagged coho salmon were determined using four stationary receiving stations positioned throughout the drainage and four aerial flights of the entire drainage. Coho salmon were also sampled for age, sex, and length data above the North River counting tower and in the Unalakleet River above the North River confluence. Two sample mark-recapture techniques were used to estimate total drainage abundance.

A population abundance estimate of 134,531 coho salmon (SE=28,550; 95% credibility interval of 111,800 to 223,500) was generated for the entire Unalakleet River drainage, and 19,189 were counted past the North River tower. The proportion of coho salmon entering the Unalakleet River that migrated past the North River tower was 14% in 2004 and 15% in 2005, which indicates the North River supports a moderate, but consistent fraction of the run. All aged coho salmon were determined to be either age-2.1 or -1.1. Similar proportions of both ages of fish were observed in the North and Unalakleet rivers throughout the run. Coho salmon sampled in the North River were smaller, on average, than those sampled in the Unalakleet River, and the run timing pattern of North River coho salmon was similar to the pattern for those returning to other parts of the drainage. Coho salmon migrated into all tributaries of the drainage with the largest concentration of fish migrating to the stretch of the Unalakleet River above the Chiroskey River and below the North Fork Unalakleet River. Later running fish tended to congregate in the portion of the Unalakleet below the North Fork and above the Chiroskey River, although tributary spawners were seen throughout the run. Estimated proportions of coho salmon migrating to various portions of the drainage were 0.143 (SE=0.024) to the North River, 0.573 (SE=0.047) to the mainstem of the Unalakleet River below the North Fork, and 0.284 (SE=0.040) to the upper Unalakleet and its tributaries including 0.017 (SE=0.009) to the Chiroskey River, 0.092 (SE=0.021) to the Old Woman River, 0.030 (SE=0.011) to the North Fork, and 0.608 (SE=0.041) through the Federal Wild and Scenic portion of the river. An estimate of abundance for coho salmon entering the wild and scenic portion of the river was 81,798 (SE=22,070).

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