

Characteristics of Spawning Adult Steelhead in Crooked and Nikolai Creeks, Kenai Peninsula, Alaska, 2004 – 2009

Adult steelhead *Oncorhynchus mykiss* were enumerated and sampled for age, sex, length, and genetic information in Crooked and Nikolai creeks during spring spawning migrations between 2004 and 2009. Fish weirs equipped with underwater video systems and fish traps were used to collect the information. Studies were initiated during 2004 in Crooked Creek and later included Nikolai Creek from 2005 to 2009. Escapement information was collected during all years and estimates of total escapement and run timing were obtained by analyzing information collected during years when at least half of the expected run duration was observed at both creeks (2006 – 2009). Mean estimated escapement from 2006-2009 was 708 steelhead for Crooked Creek and 560 steelhead for Nikolai Creek. Modeled run timing was similar for both creeks. Females comprised on average 58% of the run for Crooked Creek and 62% for Nikolai Creek. Mean lengths of male and female steelhead sampled from Nikolai Creek were larger than those sampled from Crooked Creek. Steelhead populations in each creek were comprised of up to 18 different life-history age patterns that included variations in smolt age, saltwater residence prior to sexual maturity, and number of spawning events. The predominant life history pattern found for Crooked Creek steelhead was three years of freshwater rearing followed by two years in the ocean prior to spawning, whereas the predominant life history pattern for Nikolai Creek steelhead was four years of freshwater rearing followed by three years in the ocean prior to spawning. More females than males were repeat spawners in both creeks. Genetic analyses of fin tissue samples indicated that steelhead populations in Crooked and Nikolai creeks were genetically distinct ($P < 0.017$). Crooked Creek steelhead were genetically similar to those from Anchor River, a system located to the south of the Kasilof River that was the original source of broodstock used to enhance the wild run to Crooked Creek.

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