PERFORMANCE REPORT

STATE: Alaska **GRANT NO.:** F-10-33

GRANT TITLE: Sport Fish Investigations in Alaska

PERIOD COVERED: July 1, 2017 – June 30, 2018

STUDY NO. AND TITLE: S-2-35 Crooked Creek Chinook Salmon Assessment Project

STUDY OBJECTIVES:

Crooked Creek Objectives:

1. Census the escapement of naturally- and hatchery-produced Chinook salmon in Crooked Creek that pass through the weir from July 1 to the middle of August, and then again from late May to June 30 the following season.
2. Estimate the age composition, sex composition, and age-by-sex composition of the naturally- and hatchery-produced Chinook salmon in Crooked Creek such that the estimated proportions are within 10 percentage points of the true value 90% of the time.

Crooked Creek Tasks:

1. Hold, imprint, and release approximately 140,500 Chinook salmon smolt at Crooked Creek Hatchery in June, 2018.
2. Collect, hold, and artificially spawn a minimum of 101 male and 101 female naturally- and hatchery-produced Chinook salmon adults returning to Crooked Creek during July to produce approximately 140,000 smolt to release into Crooked Creek and up to 315,00 smolt for other releases in 2018.
3. Monitor upstream migration of returning adult sockeye salmon during the Chinook salmon run from late May to mid August.
4. Summarize coded wire tags recovered from Chinook salmon stocked into Crooked Creek in previous years including recoveries found outside of the Kasilof River drainage.
5. Estimate the mean length-at-age of the naturally- and hatchery-produced Chinook salmon in Crooked Creek that pass through the weir from late May to the middle of August.

RESULTS/DISCUSSIONS:

Crooked Creek

Objective 1: The Chinook salmon run to the weir from July 1 to August 11, 2017 was 1,632 fish: 963 ocean-age 2+ naturally-produced fish, 669 ocean-age 2+ hatchery-produced fish and 381 ocean-age 1 jack salmon. The escapement consisted of 884

ocean-age 2+ naturally- produced fish, 219 ocean-age 2+ hatchery-produced fish and 119 ocean-age 1 jack Chinook salmon during this time.
The Chinook salmon run to the weir from May 25 to June 30, 2018 was 47 fish: 30 ocean-age 2+ naturally-produced fish, 17 ocean-age 2+ hatchery-produced fish and 17 ocean-age 1 jack salmon. The escapement consisted of 30 ocean-age 2+ naturally-produced fish, 17 ocean-age 2+ hatchery-produced fish, and 14 ocean-age 1 jack salmon during this time.

Objective 2: The spawning escapement (ocean-age 2+) was 80% naturally-produced and 20% hatchery-produced Chinook salmon. The sex composition for ocean-age 2+ naturally-produced Chinook salmon was 47% females and 53% males and for hatchery-produced Chinook salmon 53% females and 47% males. The age-composition of naturally-produced Chinook salmon was 27% age-1.2, 62% age-1.3 and 11% age-1.4 fish. The age-composition of hatchery-produced Chinook salmon was 44% age-1.2, 56% age-1.3 and 0% age-1.4 fish. Precision goals for estimates of age and sex of naturally-produced Chinook salmon and hatchery-produced Chinook salmon satisfied the project objectives (within 10 percentage points of the true value 90% of the time).

Crooked Creek Tasks:
Task 1: We held, imprinted and released approximately 149,622 Chinook salmon smolt into Crooked Creek in June, 2018.

Task 2: We collected, held, and artificially spawned 37 female and 35 male naturally-produced Chinook salmon and 143 female and 124 male hatchery-produced Chinook salmon in 2017. We collected and fertilized 953,841Chinook salmon eggs for planned smolt releases at Crooked Creek and other fisheries on the Kenai Peninsula in 2018.

Task 3: A total of 26 sockeye salmon were enumerated in 2017. One sockeye salmon escaped and the other 25 were captured and destroyed during sampling periods.

Task 4: Zero hatchery-produced Chinook salmon of Crooked Creek origin were recovered in 2017.

Task 5: The mean length-at-age of naturally-produced Chinook salmon is 611 mm for ocean-age 2, 751 mm for ocean-age 3, and 812 mm for ocean-age 4 fish. The mean length-at-age of hatchery-produced Chinook salmon is 605 mm for ocean-age 2, 740 mm for ocean-age 3 and there were no ocean-age 4 fish.

FINAL REPORT STATUS:

This performance report constitutes the final report of activities for this study during this reporting period. Objectives relating to Crooked Creek will be reported in a Sport Fish Division Fishery Data Series (FDS) report entitled The “Assessment of Crooked Creek Chinook Salmon, 1999-2017” and is expected to be published in 2019.

Figure 1. Crooked Creek Chinook salmon weir and fish ladder.

Figure 2. Crooked Creek digital video images of upstream migrating Chinook salmon.

PREPARED BY: Andrew J. Waldo **DATE**: August 6, 2018