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East Fork Andreafski River Weir - Technicians

Final Report for Study No. FIS 01-026-3

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Abstract:

The Office of Subsistence Management entered into an agreement with the Bering Sea Fishermen's Association and the Yupiit of Andreafski wherein the Office of Subsistence Management provided funds for local hire technicians at the East Fork Andreafski Weir project. The purpose of the weir was to collect accurate, timely and as complete as possible salmon escapement information on this important Yukon tributary.

Key Words: abundance, distribution, escapement, enhancement, data collection, migration, habitat, subsistence, ASL (age-sex-length), Yukon

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Introduction

The Andreafski River is one of the many lower Yukon River Tributaries on the Yukon Delta National Wildlife Refuge (Refuge). The main stem Andreafski River and its primary tributary, the East Fork, provide important spawning and rearing habitat for chum (*Oncorhynchus keta*) Chinook (*O. Tshawytscha*) and coho (*O. Kisutch*) salmon (USF&WS 1991). The Alaska National Interest Lands Conservation Act (ANILCA) mandates that salmon populations and their habitats be conserved within the Refuge, international treaty obligations be fulfilled and subsistence opportunities for local residents be provided. Compliance with ANILCA requires reliable data on salmon stocks originating on Federal Conservation Units. Escapement data collected at the weir is also used by the Yukon Panel discussions concerning the U.S./Canada negotiations for Canadian stocks. The escapement information is also used for forecasting future returns of chum salmon.

The Andreafski River supports the largest return of pink salmon in the Yukon River drainage and typically ranks second to the Anvik River in summer chum salmon escapement and second to Salcha River in Chinook salmon escapement (Sandone 1989). Andreafski River salmon also contribute to a large subsistence fishery and pass through two commercial fishery districts between the Yukon and Andreafski River mouths (Bergstrom et al. 1995)

Escapement to individual tributaries and main stem spawning areas are required to maintain genetic diversity and sustainable harvests, but management is complicated by the mixed stock nature of the Yukon River Fishery. Managers attempt to distribute catch over time avoid over-harvesting individual stocks as each may have distinct migratory timing (Mundy 1982). Chum salmon returns to the Yukon River in 1993 were extremely poor, prompting closures of both commercial and subsistence fisheries. Coho, pink and sockeye salmon abundance data are extremely limited or unavailable, and escapement objectives have not been established for these species in lower Yukon River tributaries.

In an effort to collect more accurate, timely and complete escapement information, sonar was used to monitor summer chum salmon returns in the East Fork from 1981 to 1984 (Sandone 1989). However, accuracy of escapement estimates was affected by large pink salmon returns in 1982 and 1984, and high water prevented proper transducer deployment in 1985. In response to the difficulty of using sonar in the East Fork, a counting tower was used from 1986 to 1988. Favorable water conditions permitted extrapolation of summer chum, Chinook and pink salmon escapements from visual tower counts. Summer chum and Chinook salmon escapements were monitored solely by aerial index surveys from 1989 to 1993 (Bergstrom et al. 1995)

The United States Fish & Wildlife Service (USF&WS) established the fish weir in 1994 with the use of Stewardship funding available for three years. During FY 1997 the USF&WS entered into a Challenge Cost share agreement with BSFA to operate the weir. In FY 1998 the USF&WS obtained Yukon River funding, however the funding was inadequate to operate the weir for the entire season, funding was made available from Bering Sea Fishermen's Association (BSFA) for the project from the Western Alaska

Salmon Research and Restoration funds granted from the Department of Interior, Bureau of Indian Affairs (BIA).

The Office of Subsistence Management has, over the course of the project, provided funds through which local technicians have been hired to work at the weir alongside U.S. Fish and Wildlife Service Employees. In addition to OSM funds, the BIA awarded BSFA funds to support or conduct research projects within western Alaska after the chum salmon disaster occurred in 1993. BSFA has provided these research funds to support the Andreafski weir previously.

Objectives

- To provide funding for the hiring of local individuals to act as fisheries technicians at the weir site. These individuals are to help with all aspects of the weir, including enumeration of the resident salmon species.

Methods and Discussion

The pre-season planning for the 2001 season went smoothly with BSFA being awarded funding in a timely manner, USF&WS pledging assistance for setup and the Algaaciq and Yupiit tribes providing hiring and onsite management assistance.

The 2001 season got off to a slow start due to high water conditions. Weir installation began on July 11, 2001, with the installation stopping and starting due to water conditions. A resistance board weir spanning the East Fork Andreafski River, at 26.7 miles upstream from the confluence of the Yukon and Andreafski rivers was reinstalled. Standard installation procedures, utilizing wet suits and snorkel gear were used. After installation the crew monitored the condition of the weir, again using snorkel gear to inspect weir integrity and all the while keeping the weir clear of debris.

The first full day of counting was July 15, 2001 with operation ceasing on September 15, 2001. Counting followed standard procedure. Fish were allowed to pass through a fish pass installed near mid-channel in the weir; 1.8 inch spaces between the pickets of the weir allowed resident fish and smaller pink salmon to pass. Fish were counted and separated out by species. Duration of counts depended on the rate of fish passage through the weir

With counting starting almost a full month after the anticipated start date of between June 15th and 20th, escapement numbers are only partial counts. These counts consist of 2,086 chum salmon, 1,148 Chinook salmon, 820 pink salmon, 15 sockeye salmon and 9,252 coho salmon counted through the weir. Peak passage numbers normally occur: July 3-11

for chum and Chinook salmon; July 22-28 for pink; and August 26-September 1 for sockeye.

Salmon Age-Sex-Length was collected and consisted of measuring length, visually determining sex and collecting scales for aging. Fish were released, live, after collection of ASL data. Length was measured from mid-eye to fork of caudal fin and rounded to the nearest millimeter. Sex was determined by observing external features such as body shape, snout length and adipose fin size. Scales are removed for aging at pre determined “preferred” areas. If scales were not present in any of the “preferred” areas or if the scales present were re-generated or damaged, a scale from an area that is not “preferred” area was taken and this was noted. Age, sex and length data was collected from 121 chum, 136 Chinook and 325 coho salmon.

Counts of chum, Chinook, and pink salmon, although partial, appeared to be below average when compared to prior years. Coho salmon appeared to have above average escapement.

The 2002 season began with better water conditions than the previous year, and the weir was able to be operational from June 19, 2002 through September 14, 2002, with two days missed (September 2&3) due to the absence of a crew leader. The weir was in the same geographic location as the previous season. Operational procedures, counting schedules and ASL sample collection were performed in the same manner as in 2001.

In 2002 a total of 44,194 chum, 4,123 Chinook, 165,990 pink, 43 sockeye and 3,534 coho salmon were counted through the weir. Peak weekly passage occurred: June 30-July 6 for chum; July 7-13 for Chinook; and September 1-7 for coho salmon. Age-Sex-Length data were collected from 869 chum, 468 Chinook and 281 coho salmon.

Chum salmon escapement during 2002 was below the average for 1994-2000. 2001 was not included in this average, due to incomplete counts, resulting from high water events. Chum salmon run timing was similar compared to previous years.

Chinook salmon escapement during 2002 was slightly above the average for 1994-2000. 2001 was not included in this average, due to incomplete counts, resulting from high water events. Chinook run timing was early compared to previous years.

Pink salmon escapement during 2002 was slightly below the 1994-2000 average. There was, however, a larger return of pink salmon compared to the year 2000. Pink salmon run timing was early compared to previous years.

Coho Salmon returns in 2002 appeared to be late. Fish counts through September 14 were less than 50% of the 1995-2001 average. However due to extremely low water conditions during the typical peak timing for coho salmon, there is the possibility that many spawners that held up in lower parts of the river went un-counted. Therefore, the 2002 weir escapement is considered to be a conservative estimate of the actual escapement.

The 2003 season the weir was operational from early June 2003 through September 15, 2003. The weir was in the same geographic location as the previous two seasons. Operational procedures, counting schedules and ASL sample collection were performed in the same manner as in 2001.

In 2003 a total of 22,603 chum, 4,383 Chinook, 4,301 pink, 485 sockeye and 7,973 coho salmon were counted through the weir. Whitefish numbers were kept this year, and totaled, 1,935. Other resident/non-salmon fish were not recorded. ASL data were taken from 535 Chinook, 1,108 chum and 716 coho.

Conclusions

This project has been run well and yielded good information. The presence of all cooperating entities, The Office of Subsistence Management, The Bering Sea Fishermen's Association, The Yupiit of Andreafski and the USF&WS on site crews, created an opportunity for this project to receive the insight of several points of view. Making local hire a priority allowed for individuals without a concrete scientific or research background to learn a new set of skills, and their presence and local knowledge was a welcomed and integral part of the success of the project.

The weir site also doubled as a site for a science camp where local youths learned about the biology of local fish and limnology of the Andreafski River. This part of the project, although not a tangible benefit, acted as an outreach to the surrounding communities and allowed for the children to learn and bring back knowledge of the project so that members of their community could understand the process and be accepting of the weir as well. Also helping in the acceptance by the surrounding communities was the presence of local individuals working at the weir

Recommendations

1. Continued support for local involvement in the project

Acknowledgements

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Statement of Non-Discrimination

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Appendix



Local Hire Willy (2003)



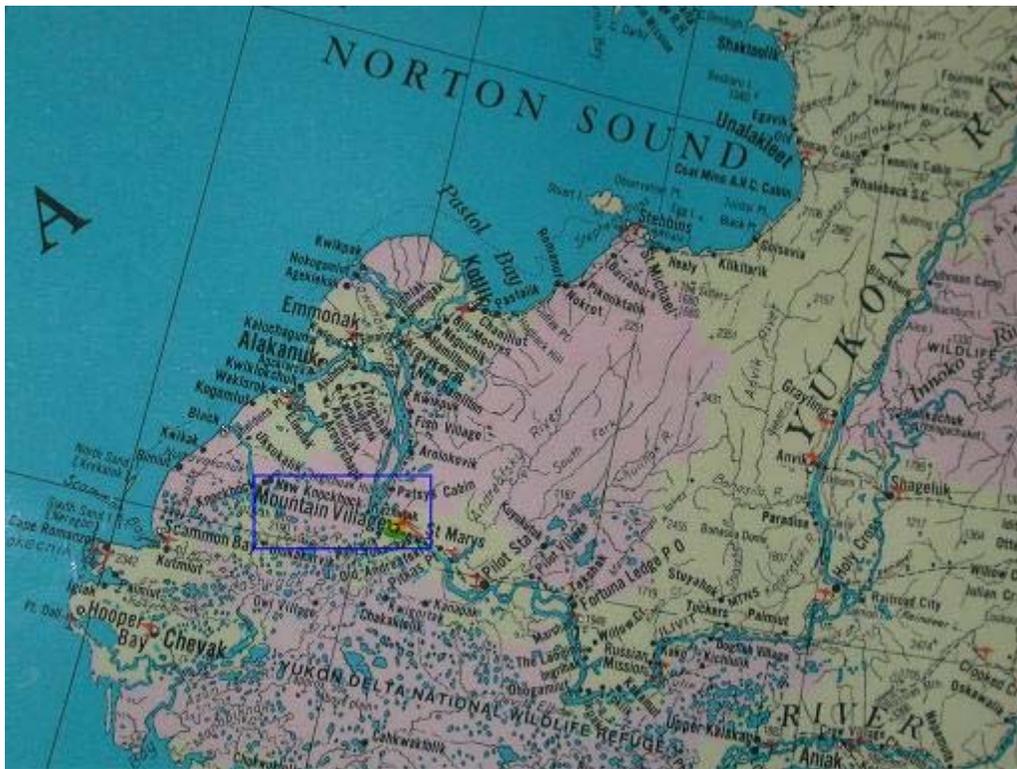
View of weir (2003)



Camp (2003)



View of River at weir (2003)



Map of drift area