

## Title: Kwethluk River Weir: Enumeration of Salmon Escapement with Videography

Study Number: FIS 12-309

Study Objectives and Results: The Kenai Fish and Wildlife Field Office, assisted by the Organized Village of Kwethluk, purchased, installed, and operated an underwater video system in conjunction with the Kwethluk River weir during 2012. Beginning in March, components for the video system were purchased, fabricated, or modified. Components included an underwater camera, digital video recorder, hard drives, monitors, underwater cabling, water-tight camera box for housing the underwater camera in clear filtered water, fish passage chute to attach the water tight camera box and direct the fish through a controlled width channel for capturing the video. These components were shipped by air or barged to Bethel during May and June and transported by boat and/or helicopter to the weir site during May, June and July. Video (visual and recorded) was used to monitor and document the escapement of five species of Pacific salmon returning to the Kwethluk River. Video footage was utilized to collect abundance, run timing, and sex data from returning adult coho salmon. These data support in-season and post-season management of the commercial and subsistence fisheries that occur on the Yukon Delta National Wildlife Refuge and the Kuskokwim River drainage. Due to high water, flood events, and technical difficulties, coverage with the video system was not possible during the entire 2012 field season. High waters delayed the installation of the video box and camera until the last week of July. After a short operational period, the underwater video camera housing developed a leak which required the removal of the submerged water-tight camera box and shipping the camera back to the manufacturer. High water levels prevented the reinstallation of the equipment until early August. Software compatibility recognizing external hard-drives caused some down time as well. However, excellent results were obtained with approximately 418 hours of video footage collected from August 8 through September 12 during both normal and high flows. Simultaneous collections of visual, and live and recorded video provided approximately 145 total hours for comparisons during 21 different days. Additional paired visual escapement counts from on top of the weir trap with visual video or video footage was curtailed due to water turbidity. Archived video footage will allow sex ratios to be monitored during periods when Age Sex and Length data are not collected. The video also allowed the speciation of whitefish, and broad whitefish and humpback whitefish as well as round whitefish were enumerated passing the weir. On September 3, 2012, a pit-tag reader was installed on the upstream end of the video box to monitor for the return of coho salmon juveniles tagged during 2010. Approximately 1,710 coho salmon juveniles were tagged for a juvenile coho salmon habitat study (University of Montana) and 12 tags were recorded passing upstream during 2012. With the addition of videography, adult coho salmon were enumerated and sexed; which contributed to this and other studies. This was the first year of a one year funded project and a summary of this project will be included with the annual Kwethluk River weir report (FIS 10-306) due May 1, 2013. The addition of videography enhanced the weir, which is also used as a platform for other research projects. The Salmonid Rivers Observatory Network (SaRON), University of Montana has on-going projects dependent on adult salmon enumeration (i.e. coho salmon) and ASL data.