

Results from Monitoring of Stream and Wetland Habitat Mitigation for the Haines Highway 1999 – 2005, Haines, Alaska

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To meet current highway standards, the Alaska Department of Transportation and Public Facilities (ADOT&PF) reconstructed 12 miles of the Haines Highway, including placing a 2-mile realignment within the active floodplain of the Klehini River. The Klehini River, a large, dynamic, braided glacial river in Southeast Alaska, is a major migration corridor for three species of salmon, cutthroat trout and Dolly Varden char. A number of habitat mitigation features were designed and constructed in 1999-2001 for this project including:

- Creation, enhancement or relocation of approximately 17,500-ft of stream to accommodate the new highway alignment and for aquatic habitat.
- Creation of approximately 18-acres of wetlands with stream channels.
- Fish passage through 13 culverts.
- Restoration of approximately 40-acres of floodplain gravel mining.

After developing consensus among U.S. Army Corps of Engineers (USACE), National Marine Fisheries Service (NMFS), Alaska Coastal Management Program, Alaska Department of Fish and Game (ADF&G) and ADOT&PF representatives, a comprehensive Monitoring Plan was created. Details of the monitoring protocol are presented on an accompanying poster..

Streams. Stream monitoring includes: habitat typing, photo documentation, salmon carcass counts, winter juvenile salmonid trapping, and macro invertebrate assessment. Habitat typing will be used to monitor habitat composition over time during similar levels of discharge, typically during late summer. Fish presence will be monitored in two separate surveys for adult and juveniles. Adults will be enumerated in October during the height of the spawning season by wading and recording live adults and carcasses. Number and location of redds will be recorded. Juveniles will be documented through trapping during February - March.

Wetlands. Wetland monitoring includes: photos, vegetation, soils characteristics and hydrology documentation. A USACE Level 2 routine wetland determination will be conducted annually to determine presence of wetland soils, vegetation and hydrology. Data are collected by qualitative observation and photographic documentation during the June/August period of height of the growing season.

Culverts. In addition to flow conveyance, a primary objective for culverts is to provide adequate fish passage. The culvert sites will be monitored with field investigations tailored to compare annual conditions at each culvert site with as-built or construction drawings. Field investigations will include: observing and photographing annual site conditions, taking field measurements, comparing annual conditions to as-built or construction drawings, completing a culvert evaluation field form, surveying a profile of the channel thalweg, and preparing a narrative that

compares annual site conditions to the as-built or construction drawings. Monitoring will occur during low flow conditions in mid to late summer.

Mine Areas. The primary objective of the mitigation work within the river mining sites is to prevent entrapment of all life stages of fish within the mine areas. Additional objectives include maintaining stream function and habitat elements within the mine areas and adjacent channels when the Klehini River avulses into and flows through the mined areas. Monitoring activities will include identifying areas of ponded water that may trap or prevent egress by any life stage of fish from the mine areas to the Klehini River. Monitoring of the mine areas originally required annual aerial and ground based photographic documentation and annual field investigations. Monitoring has been less than planned because the Klehini River obliterated three of the four mine sites the year after construction.

Time period. Monitoring will be conducted annually for a period of 3 to 10 years by ADF&G. Annual monitoring reports are documented with a summary of project performance and action items required for under performing elements. An inter-agency team reviews preliminary findings and recommends remediation action to be taken by ADOT&PF.

Conclusions. The ongoing monitoring program will document performance of the various project features and their ability to meet project goals and objectives. Features documented during monitoring to not meet performance criteria will be repaired. The monitoring program is helpful in documenting relative success of various mitigation techniques. Future mitigation proposals should consider the results of this monitoring during the design phase program.

This presentation will highlight a selection of features that were monitored to demonstrate successes and failures of constructed mitigation projects. In the case of failure to meet mitigation objectives as outlined in the Monitoring Plan; the proposed remedy and resulting action taken will be discussed.

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