

# **Best Management Practices Implementation Monitoring Trip Report**

## **Thomas Bay Fish Passage Improvements Culvert Replacement Project**

September 6<sup>th</sup> and 7<sup>th</sup> 2006

### **Participants:**

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Crystal Harlan – Petersburg RD Fisheries Biologist  
Jim Brainard – Petersburg RD Wildlife Biologist  
John McDonnell - Tongass Fisheries Biologist  
Julianne Thompson - Tongass Hydrologist  
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Ryan Nupen - Tongass Hydraulic Engineer  
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### **Project Background**

The Thomas Bay Fish Passage Improvements contract included the replacement of eight metal and log culverts in Thomas Bay to improve aquatic organism passage. The survey and design of the replacement structures was carried out by the Forest Service. The survey, design and development of the construction contract were performed to respond to culverts identified as concerns during Road Condition Surveys (RCS). These sites were chosen as high priority sites for improving fish passage by the Petersburg Ranger District based on the best available information. Not all sites had upstream habitat assessments completed.

The work is located within the Petersburg Ranger District but has been planned and administered from the Petersburg and Ketchikan Offices of the Forest Supervisor. This work was considered routine maintenance and thus, categorically excluded from further analysis under the National Environmental Policy Act, which requires no NEPA documentation. However, a Categorical Exclusion was done for the expansion of the borrow source used during construction because this category requires documentation. Survey and design was completed in 2005 and included Title 41 consultation and concurrence by Alaska Department of Natural Resources (DNR). Construction began in mid-June of 2006 and was completed in late July of 2006; BMP implementation was monitored at four sites in September 2006. Contract administration and construction inspection was performed by Forest Service personnel.

Three to six days of in-stream work occurred at each site according to Contract Daily Diaries. The stream simulation technique used at these sites requires the special application of BMP 14.15 (Diversion of Flows Around Construction Sites). The culvert burial and placement of stream substrate within the culvert and beneath bridges requires stream de-watering.

Over 4.5 inches of precipitation were recorded at the National Weather Service weather station in Petersburg during the five days preceding the monitoring trip and 1.51 inches of rain was recorded on September 7, the day of the monitoring trip. Stream flows were normal to moderately high at most of the monitoring sites.

### **Monitoring Process**

The participants monitored the following sites at Thomas Bay (Table 1):

Site	Stream Gradient recorded during topographic survey (upstream/downstream)	Preconstruction Channel Width Through the Structure (feet)	New Channel Width Through or Beneath the Structure (feet)
Site C Rd 6256 MP 3.244	0 %/ 4.84%	3 ft. (obstructed culvert)	4
Site D Rd 6256 MP 3.445	0 %/ 2.45%	0 ft. (may have been a collapsed log culvert)	3.3
Site E Rd 6256 MP 3.543	0 %/ 1.59%	8 ft. (2 existing culverts)	17
Site G Rd 6256 MP 4.499	0 %/ 2.0%	2 ft. (obstructed culvert)	5

Table 1. BMP Implementation Monitoring site information for Thomas Bay Fish Passage Improvement Project, 2006.

We reviewed the design drawings and other available documentation in the field at each site. Some documentation was not readily available due to the status of file re-location. One standardized BMP implementation monitoring form was completed for the entire trip; we discussed notes and ratings at each site. Several participants observed that without some of the background information (Title 41 Concurrence, etc.) that we were unable to rate some of the BMP. We closed out the trip by reviewing major findings and recommendations as well as viewing a new log stringer bridge constructed under a district deferred maintenance contract.

### **Monitoring Results**

The monitoring team agreed that the logic used in the selection of sites and the assumptions used in the design process needed more clarity. Road condition survey data were used to identify and prioritize some of the sites. Detailed survey and comprehensive geomorphic reconnaissance and calculations for each site was documented but the background information performed for hydrologic calculations and assumptions was not available and it was unclear why some of the sites were designed for stream simulation when there were no upstream habitat assessments performed. Survey

and design received appropriate review and approval by Structural Engineering staff and concurrence by DNR personnel.

The Road BMP Implementation Monitoring Form contains the ratings and comments recorded on site. The participants agreed that from a strict *water quality perspective*, all applicable BMPs were fully implemented at all four sites. Turbidity data was available for three of the sites and water quality criteria were achieved at all sampled sites. None of the downstream turbidity samples exceeding 5 NTU over the upstream turbidity after 48 hours.

Highlights are summarized below for the most relevant BMPs.

#### **BMP 12.5 (Wetlands Protection Measures)**

This BMP applied to all sites. All sites monitored are slough-like and act as connections between the main slough and Muddy River. Flow here can be ground water dependant and the road prism does interfere with flow and has probably created the pond and wetland condition in some locations. All sites maintained the pre-construction water levels and wetlands upstream with the exception of site C and D. At site C, a minor reduction in the pre-construction pond level to allow consistent flow through the culvert and at site D the pre-existing pond level was lowered 1 foot to achieve a lower gradient and slower flow through the pipe per design.

#### **BMP 14.6 (Timing Restrictions for Construction Activities)**

This BMP applied to all sites. Each site was considered a Class I tributary to the Muddy River. Each stream site was listed as containing Silver Salmon, Cut Throat Trout and Dolly Varden and timing restrictions were listed in the contract as being June 1 through September 15. A rating of five was assigned for all sites as construction was completed within the timing window.

#### **BMP 14.8 (Measures to Minimize Surface Erosion)**

Contract Daily Diaries documented seeding within specified timing window. Vegetation was established at all sites (see Photo 1). This BMP received a rating of five, reflecting full implementation.

#### **BMP 14.9 (Drainage Control Structures to Minimize Surface Erosion and Sedimentation)**

The participants briefly reviewed the maintenance work that was administered by the Petersburg Ranger District but did not complete a BMP monitoring form. The fish passage improvement contract only included stream crossings but we did note that at least one road segment west of Site G was inadequately drained. Water was diverted by the road here and further east in the same area of some of the differed maintenance work that was performed this year. The existing road alignment is a problem for cross drainage and annual maintenance will probably be needed.

#### **BMP 14.15 (Diversion of Flows Around Construction Sites)**

Temporary cofferdams and trash pumps were used upstream of each site to divert water through hoses around the construction site and at site G a diversion channel was dug to temporarily reroute the stream. A second pump was typically placed at the culvert outlet to remove sediment-laden water from the excavated "hole." Water was released onto the

forest floor and allowed to filter through native vegetation back to the stream downstream of the culvert. Silt fences were placed as necessary to detain fine sediments. All evidence of coffer dams and sediment detention materials had been removed prior to our review. This BMP received a rating of five, reflecting full implementation.



Photo 1. Site E, Bridge at Road 6256 MP 3.543. Photo taken looking towards Thomas Bay. Note well-established vegetation (BMP 14.8). Note placement of riprap along banks (BMP 14.17), and rock weir partially visible was used to maintain the preconstruction pond elevation (BMP 12.5).

#### **BMP 14.17 (Bridge and Culvert Design and Installation)**

All installations and contract administration were fully successful. At most sites the participants observed and discussed the following: 1) It was unclear why stream simulation design was chosen when no upstream habitat assessment had been performed and some sites had no verifiable fish presence, 2) At the time of the monitoring trip the team could find no design narratives to explain the trade offs or rationale for leaving a bed control structure out, 3) The design drawings contained errors including copied Q50 flows and references to instream bed control structures that weren't to be built. It was also noted that at site C, the DNR concurrence was for a bridge to be installed but instead a stream simulation culvert was built with no record of a change in the concurrence.

The stream simulation design dictated culvert alignments that minimized grade and we noted that appropriate size and placement of riprap along stream bank and road prisms was performed to prevent erosion and maintain channel shape. Rock weirs and borrow

material at culvert inlets were functioning and maintaining upstream water levels. Site C had yet to receive surface flow so there was some question as to the design elevation of this structure.



Photo 2. Culvert inlet at Road 6256 MP 3.244. Dry Channel, note the rock weirs, channel banks and rip rap.

**BMP 14.18 (Control Rock Pit Sedimentation)**

The pit used at MP 2.85 was expanded as recommended and stated in the previously written Categorical Exclusion. The expansion was to the southeast, parallel to road 6256 and no closer to the Muddy River. The pit walls were buttressed to prevent sloughing and the pit floor was graded to drain. Waste materials that were placed in the pit were shaped to drain and seeded. Participants noted that the site could use more long-term vegetation but that it was not a concern for erosion.

# Thomas Bay Fish Passage Structure Work

