

Soil and Water Question 2a Appendix

Best Management Practices Implementation and Effectiveness Monitoring Petersburg Ranger District Road Storage Trip Report – Mitkof and Kuiu September 2012

Summarized by Julianne Thompson

An interdisciplinary group evaluated Best Management Practices (BMPs) on randomly selected Maintenance Level 1 (ML-1) roads on Mitkof Island and Kuiu Island on the Petersburg Ranger District (PRD).

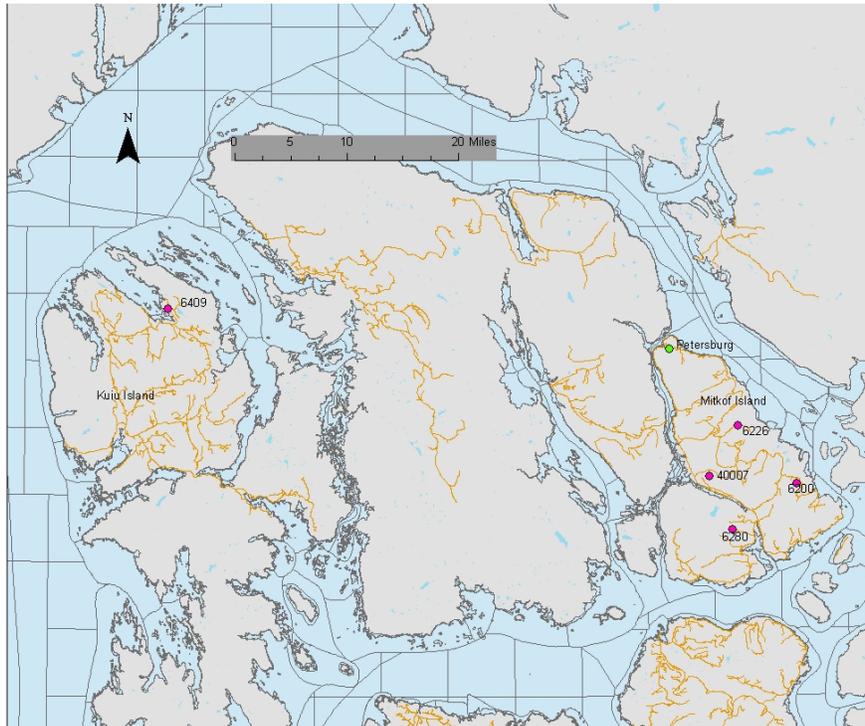


Figure 1. Map of Roads Evaluated on Petersburg Ranger District, September 2012

The Petersburg District Ranger signed the Decision Notice for the district Access and Travel Management Plan (ATM) on Sept 11, 2009. The ATM divided road closures into three categories:

- *The 1A closure* category involves providing environmental protection to critical resources in the form of erosion control while leaving the road as passable as possible. This usually results in adding drivable waterbars to the road surface on steep grades. Administrative use with high-clearance vehicles and OHVs may or may not be possible due to vegetation blocking the road and drainage structures that have been removed...
- *The 1B closure* category involves removing some or all structures that cross streams sensitive to disturbance, and adding drivable waterbars to the road surface on steep grades. Administrative use with an OHV may be possible unless vegetation blocks the road...

- *The 1C closure category involves removing all drainage structures and adding waterbars to the road surface on steep grades. Administrative access with a motorized vehicle is not possible...*

All ML1 roads are closed to motorized use unless designated as a trail, authorized by permit, or for administrative use.”

Kuiu roads 6405 and 6409 were randomly selected from a subset of road storage projects that were implemented in 2011. Inclement weather prevented the group from flying to Kuiu during the allotted time, so additional roads were randomly selected from the total population of ML-1 roads we could drive or hike to on Mitkof Island. These roads had not had recent storage projects. A smaller group was able to fly to Kuiu the following week and evaluate Road 6409, but did not have time to evaluate Road 6405.

Table 1. POW roads selected for quality control monitoring, 2012

Road	Location	ATM closure category – vehicle designation	Known Storage Project
40007	Mitkof Island	1A – foot	No
6200	Mitkof Island	1A – foot	No
6226	Mitkof Island	1C – OHV trail	Yes – about 2007
6280	Mitkof Island	1B – foot	No
6409	Kuiu Island	1B – foot	Yes - 2011

We conducted evaluations on the Mitkof Island roads during heavy rains. Over six inches of rain fell in a 48 hour period, resulting in streams flowing over bankfull. Completed BMP Evaluation forms for the roads, including photographs, are attached.

BMP Implementation

The implementation questions evaluate practices used to minimize water quality impacts. In general, roads that had been physically stored (6409, 6226) applied BMPs during storage and these roads require few corrective actions.

Although there was no contract inspection of Kuiu Road 6409 when it was stored in 2011, applicable practices for erosion control, equipment-stream crossings, drainage, and revegetation appeared to be fully implemented (picture 1).



Picture 1. Road 6409 MP 0.271 view of downstream left bank after log stringer bridge removal. Despite failure to fully restore channel width, note bank slopes and success of erosion control seeding.

Excavated material at streambanks was stable and additional water bars (more than the contract specified) were appropriately located. Practices for stream channel stabilization and fish timing windows were not fully implemented and unauthorized OHV use is evident. We noted a previously un-identified fish stream (not identified as a work item in the contract) that was partially treated by removing some fill over a culvert to allow water to cross the road (picture 2).



Picture 2. Road 6409 vicinity of MP 0.3. Unmapped anadromous fish stream with 24" CMP left in place.

Mitkof Road 6226 was stored as an OHV trail at least five years ago, so we did not evaluate contract specifications for applicable BMPs. We think the plan was to remove all structures, but this was changed in consultation with aquatic personnel and log culverts were retained (other structures had previously been removed) in order to avoid steep/deep OHV crossings. The road surface is well-vegetated and water bars are appropriately located (picture 3). We did not identify corrective actions for this road, but agreed that we would have added additional waterbars to prevent stream diversions if we were storing the road now.



Picture 3. Road 6226 road surface is well-vegetated with water bars. Additional water bars needed, though the ones present were appropriately located.

Roads that had not been physically stored (Mitkof Roads 6200, 6280, 40007) need corrective actions to implement BMPs. Roads 6200 and 40007 are open and used by motorized vehicles. Road 6280 is blocked by a tank trap and brushy. Corrective actions include storm proofing of structures, structure removal, water bar installation, ditch and catch basin maintenance, and fish stream culvert maintenance or remediation (pictures 3, 4 and 5).



Picture 4. Road 40007, open and drivable, with Class IV stream diversions. Storm proofing is needed.



Picture 5. Road 6280 near MP 2.2. Stream is diverted onto road for about 400 feet. Storm proofing, water bars and structure removal needed.



Picture 6. Road 6200 MP 0.273, resident fish stream. 36" CMP appears plugged, with water running across road. Structure needs maintenance, storm proofing and evaluation for fish passage.

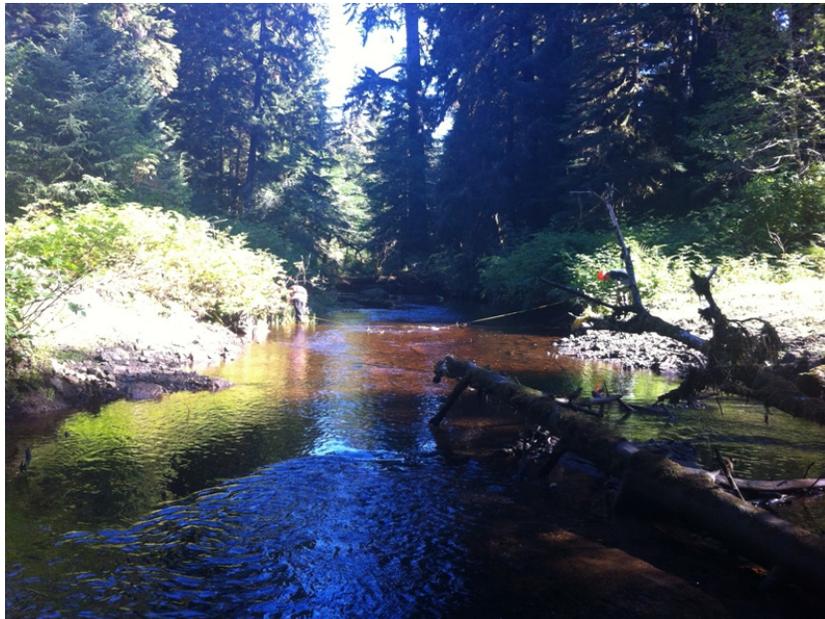
Corrective Actions to Improve Implementation

The following corrective actions are recommended for these roads:

- Kuiu Road 6409: Removal of culverts from fish streams did not meet contract specifications for excavating to the streambed's original elevations. Excessive road fill left in channels resulted in channel widening through the road prism and potential barriers to fish passage at low flows (picture 7). Bridge removal from a fish stream did not restore streambanks to natural channel bed width (pictures 1 and 7). Since no equipment is mobilized on Kuiu Island, the cost is not justified to return equipment to this road to correct. We recommend monitoring (including un-mapped fish stream near MP 0.3) to determine if fish passage is impaired during dry seasons. Hand work or blasting may be necessary in the future.
- Mitkof Road 6200: Water was concentrating on road in a couple places. A fish stream culvert at MP 0.273 is plugged, with water flowing across road (picture 6). We recommend storm proofing culverts and adding drivable waterbars. The fish stream culvert was rated green for fish passage in 2004; we recommend maintenance, reassessment, and possible remediation.
- Mitkof Road 6280: Culverts are plugged and streams are diverted down road during high flows (pictures 5 and 9). We recommend removal of culverts and installation of water bars. Brush may limit equipment access, will need to be evaluated for blasting.
- Mitkof Road 40007: Culverts are plugged and small streams are diverted down the road during high flows (picture 4). We recommend cleaning catch basins, ditches, and adding drivable waterbars.



Picture 7. Road 6409 MP 2.016 after 48" CMP removed from anadromous fish stream. Excessive fill left in channel.



Picture 8. Road 6409 MP 0.271. Log stringer bridge removed from anadromous fish stream. Note road fill constricting channel.



Picture 9. Road 6280 MP 1.846. Alluvial fan crossing where a 24" CMP has plugged. Water is flowing over road and diverted down road.

Adaptive Management Actions to Improve Implementation

The following adaptive management actions were discussed as lessons learned from these roads that should be applied to improve BMP implementation across all road storage projects:

- Continue increased efforts to fully implement specifications for fill removal from fish streams when culverts and bridges are removed. Ensure that all roads with fish stream crossings are inspected during contract implementation.
- Review bridge removal drawings to ensure they address fill removal from streams to restore natural stream width.
- Increase awareness of potential for fish streams that were not identified in Road Condition Survey. Roads with fish stream potential should be high priority for aquatic specialist field verification of work items prior to contract development.
- Flag water bars and ditch drains to ensure they are installed in appropriate locations. They cannot be evenly spaced per mile or averaged per road or by contract. Extra water bars pay off in the long run.
- Ensure equipment operators complete work within applicable timing windows. Document in daily diaries.
- Do not assume that administrative closures suffice for BMP implementation on ML-1 roads.
- Prioritize roads to assess for physical storage needs and BMP implementation. Fish stream crossings, alluvial fans or other unstable terrain, and known problems from Road Condition Survey data are all useful for prioritizing roads for storm proofing and other physical storage measures.
- Regularly inspect green fish pipes on ML-1 roads for changing status, maintenance, or remediation needs.

BMP Effectiveness

The effectiveness questions evaluate evidence of potential or current impacts to water quality. Unauthorized motor vehicle use on three roads does not appear to be causing water quality impacts. There is potential for impacts on Kuiu Road 6409 which has five fish stream crossings. This road needs a more effective traffic barrier. Mitkof Road 6280 is currently impacting water quality due to culvert failures and stream diversions. Erosion on all other roads was not observed or was minor and localized. All of these roads were predominantly overlay construction, with minimal inside ditch to drain. Where water bars had been installed, they were effective at turning water off the road, even when installed over or adjacent to retained culverts.

Corrective Actions to Improve Effectiveness

The following corrective actions are recommended for these roads:

- Kuiu Road 6409: No traffic barrier was installed. OHVs (and possibly high clearance vehicles) can still access fish stream crossings. We recommend installing a more effective traffic barrier to prohibit motor vehicle access.
- Mitkof Road 6280: The alluvial fan crossing at MP 1.85 had plugged culverts recorded in 1999. We recommend evaluating the fan and its stream channels up and downstream of the road to determine the most effective treatments to re-connect downslope fish streams and avoid cascading failures caused by stream diversions. Culvert and fill removal may require installation of bed control structures to minimize headcutting.

Adaptive Management Actions to Improve Effectiveness

The following adaptive management actions were discussed as lessons learned from these roads that should be applied to improve BMP effectiveness across all road storage projects:

- Pursue dialog regarding policy and implementation of effective physical traffic barriers on ML-1 roads that access sensitive waterbody crossings such as wetlands and fish streams. Policy and understanding is inconsistent across the Forest and especially across programs (recreation, engineering, aquatics). Pro-active use of traffic barriers would discourage motorized use in compliance with Road Management Objectives and prevent resource damage.
- Encourage periodic assessment and ranking of ML-1 roads using existing information to identify resources at risk and maintenance needs.
- Inspect roads during or immediately after storms to evaluate runoff patterns, diversion potential, and effectiveness of drainage structures and storm proofing measures.