

Soil and Water Question 2a Appendix

Best Management Practices Implementation and Effectiveness Monitoring Thorne Bay Ranger District Road Storage Trip Report – Wolf Pup / Stoney Creek, Logjam; September 20-21, 2012

Summarized by Carol Seitz Warmuth

This interdisciplinary trip was conducted on the Thorne Bay Ranger District on Prince of Wales Island (POW) in September 2012. The intent of the Best Management Practices (BMP) review was primarily to provide quality control to the BMP implementation and effectiveness monitoring effort on the Forest. Participants on the interdisciplinary trip included: Keith Webb (Roads Engineer), Angela Coleman (Hydrologist), Sheila Jacobson (Fish Biologist), Betsy Walker (Fisheries Technician), Maeve Taylor (Acting District Ranger), Suzanne Webb (Planning SCEP), and Carol Seitz Warmuth (Tongass Monitoring & Inventory Coordinator).

The Interdisciplinary Team monitored 4 roads as part of the quality control monitoring. These roads included Roads 3000360, 3000375, 3000382, 2000530, and 2000454. Work on 3000375 was not completed at the time of the review, so it was dropped from the monitoring pool for fiscal year 2012. The roads stored, through the POW Road Storage contract in 2011 and 2012, were covered in the Thorne Bay Ranger District ATM Plan EA with a Decision Notice signed in 2009.

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

Road	ATM Decision	Storage Category	Treatment Length	Notes
3000360	ML1 with foot traffic	C	MP 0 – 1.81	Monitored
3000375	ML1 with foot traffic	C	MP 0 – 0.94	Work not completed at time of review
3000382	ML1 with foot traffic	C	MP 0 – 0.65	Monitored
2000530	ML1 with foot traffic	Implied C	MP 0 – 0.48	Monitored
2000454	ML1 with foot traffic	Implied C	MP 0 - 0.51	Monitored

Background

The POW Road Storage is still ongoing; however, only roads where storage or decommissioning activities completed were considered as part of the monitoring pool. The storage work is being completed under the 2008 Standards and Guidelines. The roads were monitored on central Prince of Wales Island in the Wolf Pup / Stoney Creek- Logjam area.

Considering the Logjam roads, the decision objective shown in the ATM Plan for road 3000360 was stored (decision objective level 1- storage; no motorized use) from MP 0.00 to 1.87 with a recommended use for foot traffic. The decision objective for road 3000382 was designated as stored (decision objective level 1) from MP 0.00 to 0.65 with a recommended use for foot traffic. Road 3000360 crosses three

Class I streams and road 3000382 crossed one Class II stream so ADF&G Title 16 Concurrence was required. Based upon the August 17, 2012 concurrence letter, timing for in-stream crossings and work

was limited to the time frame from June 15 to September 1.

Examining the Wolf Pup / Staney Creek roads, the decision objective shown in the ATM Plan for road 2000454 was stored (decision objective level 1) from MP 0.00 to 0.51 for foot traffic only. The decision objective for road 2000530 was also stored for foot traffic only. Road 2000454 crossed one Class II stream and road 2000530 crossed three Class II streams so ADF&G Title 16 Concurrence was required on both roads for the fish stream crossings. The 2010 ADF&G Concurrence letter stipulated a time window from June 25- September 1 for in-stream work and equipment stream crossing on the road 2000454 fish stream crossing but no timing was required on the 2000530 road-stream crossings to aid in efficient road storage. Site conditions, distance from anadromous fish habitat, and depth of fill were taken into account in the decision to remove in-stream work timing requirements at these sites.



Picture 1. Road 3000360 looking back at MP 0.90

Storage categories and field operation direction was developed to provide a distinction between three levels of storage. These storage categories are based upon the road access needs and resources at risk. Typically, Storage Category A is suggested, when road access is needed within 5 to 10 years and minimal resources are potentially affected. These roads have drivable water bars and dips excavated in the running surface. Storage Category B is suggested when access is anticipated to be needed within 5 to 20 years and resource risks can be mitigated by site specific measures. On Category B roads, most drainage structures are left in place. Dips may be excavated near culverts, some fill removed from culvert crossings or some structures may be removed. When future access is not needed in the foreseeable future or significant reconstruction is necessary, suggestions follow to store the roads in Category C. This category is used when resource risks cannot be mitigated. On these roads, the drainage structures on Class I, II, and III streams are removed. The drainage structures on Class IV streams and intermittent streams and drainages can be retained with relief dips. Road 3000362 and 3000382 were both prescribed Category C storage. Roads 2000530 and 2000454 following an earlier contract that was awarded prior to the field direction, although most of the drainage structures were removed in the road storage contracts so the suggested practices in Category C were implemented. The contract drawings for the Logjam roads as well as the Wolf Pup/ Staney roads showed the slope gradients on the cut slopes were specified to be 2 horizontal: 1 vertical on streams and 1.5 horizontal : 1 vertical on non-stream ditch relief drainages for

sites where culverts were removed.

This monitoring was completed by application of the pilot National BMP monitoring protocols as well as the Tongass BMP implementation monitoring protocols. The forms completed for this effort were the Best Management Practices Evaluation Road D Road Storage and the Road Implementation Monitoring form. Following the national monitoring protocol, the detailed monitoring is conducted 1/2 mile on both sides of the most significant stream crossing in the road segment. The road segment that presents the greatest sensitivity relative to risks to water quality is selected for monitoring. Sensitivity evaluation includes consideration of crossing size, crossing structure, water body characteristics, geology, slope, soil characteristics, aquatic conditions and aquatic species. General notes are made on the road before and after the crossing selected to monitor. The Tongass protocol involved monitoring a representative segment of the entire road.

Monitoring Results

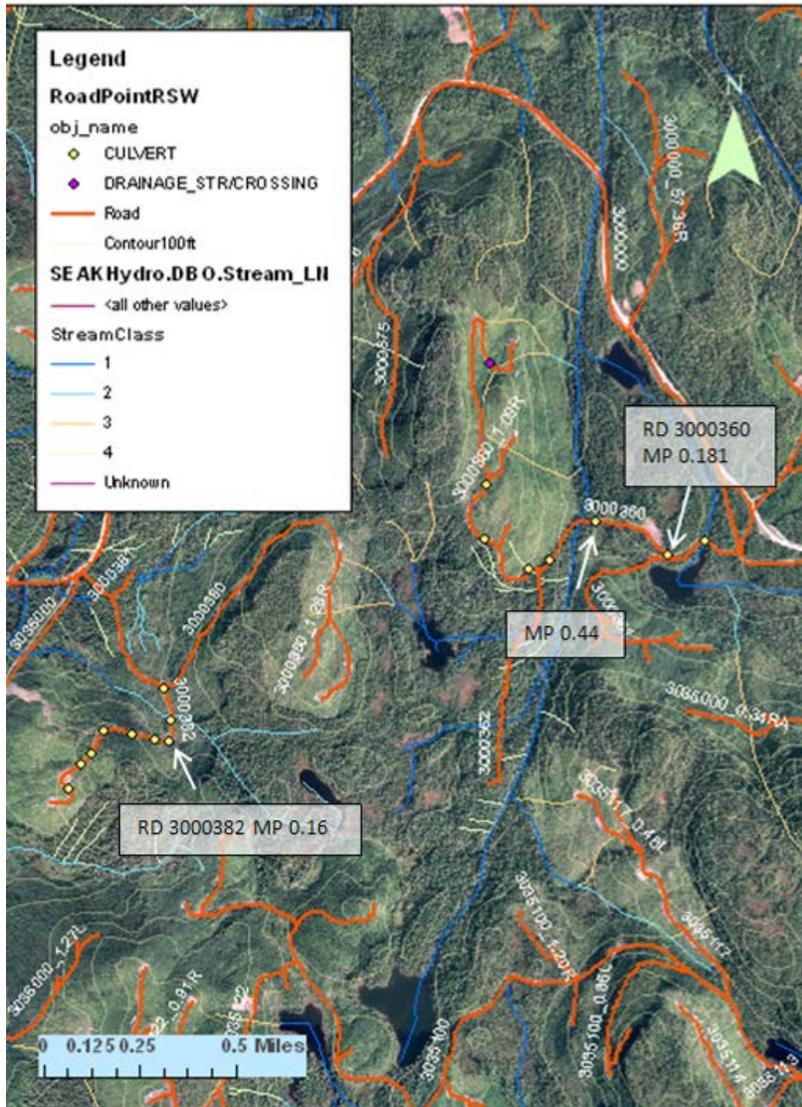
The roads monitored were located on Prince of Wales Island; access was by vehicle from Thorne Bay, Alaska. Wolf Pup/ Staney Roads 2000454 and 2000530 are located roughly in the center of Prince of Wales, east of Naukati and accessed off the 2000000 road. Logjam roads 3000360 and 3000375 are located in central Prince of Wales Island, south of Sweetwater Lake. Roads 3000360 and 3000375 are accessed off the 3000000 road.

Road 3000360

Road 3000360 is roughly two miles south of Sweetwater Lake and roughly one mile southwest of Hatchery Creek. Road 3000360 is accessed off the 3000000 road, roughly 1.5 miles west of the junction of the 3000000 and 3030000 roads. The road trends westward then curves northward toward Sweetwater Lake. The streams crossing this road are tributaries of Hatchery Creek and Sweetwater Lake. The coordinates of a reference point on the road are N 55 deg54.458' W 132 deg58.175'. The Class I stream crossings and proximity to Hatchery Creek and characteristics of the stored road were considered in selecting the site to monitor. The focal reach of the monitoring was MP 0.43/ 0.44, although the IDT reviewed the entire road segment. The road segment was stored to minimize resource impacts due to reduced budget for road maintenance.

Three culverts were removed from the road following the culvert removal typical for streams at these sites. Water bars were also excavated along the road to limit water eroding the running surface of the road. The stream at MP 0.09 is an un-cataloged anadromous tributary of Hatchery Creek. This stream was documented as a Class I channel with coho salmon and sculpin. The crossing at MP 0.09 was a relatively wide, low gradient crossing and showed water running through the crossing. The side slopes on the crossing were laid back to the 2:1 slope as shown on the contract drawings on the near side of the road; however, the slopes were relatively steep on the far side. The upstream reach of the stream channel showed a low gradient wetland area with a meandering channel. The stream crossing at MP 0.43 was a low gradient, braided channel with a gravel substrate. This uncataloged Class I stream contained coho salmon, cutthroat, and Dolly Varden. This same stream crosses the road at MP 0.44. At MP 0.44, the stream is a low gradient channel with gravel bars of rounded cobbles that meanders through a low gradient wet area. The stream reach is an un-cataloged Class I containing coho salmon, Dolly Varden, and cutthroat.

Figure 1. Road 3000360



The sites at MP 0.43/ 0.44 were selected for focused monitoring since these crossings were Class I streams.

The crossing structures at MP 0.43 and MP 0.44 were designated to be “dual culvert sites” since the road crossed the same stream with adjacent culverts. Concurrence for the in-stream work was documented in an August 17, 2012 letter from ADF&G. At MP 0.43, the excavated stream crossing showed relatively low gradient side slopes and the fill material was relatively stable and not raveling into the stream. The road was excavated to the natural stream channel dimensions and the channel did not exhibit any channel adjustment. There was a side channel shown upstream of the crossing and confluence immediately upstream of the crossing. There is water running in the road ditch and on the road on the far side of the crossing that flows to the stream. At MP 0.44, the side slopes on the excavated channel banks were relatively low gradient and stable, although there was evidence of some raveling. There were some fines deposited along the base of the slope adjacent to channel that indicated channel cutting and channel realignment.



Picture 2. Road 3000360 inlet at MP 0.43



Picture 3. Road 3000360 crossing outlet at MP 0.43

No closure devices were noted at the intersection of the road and 3000000 Road. There was a sign at the beginning of the road that it was open for firewood cutting. The initial excavated culvert at MP 0.09 served to close the road, since vehicle traffic could not ford the crossing. There is no ATV / OHV access

provided on this road. The road was put in storage roughly one month prior to monitoring and was designated Road Management Objective 1 with foot traffic only. The Forest had on file a hazardous communication / waste mitigation plan and the contract had a Spill Prevention Countermeasure and Control (SPCC) plan to address any petroleum spills.

An erosion control plan was not developed for the contract; however, the standard erosion control specifications were implemented. Seeding of bared soils to prevent erosion was required. Turf establishment was required in the contract. The seed had germinated on the road although the site was seeded less than one month ago.

Water bars across the road prism were constructed to limit water from running on the road surface and carrying sediment to the streams. There was timing on the road storage work on this road since the crossings were Class I streams. The road work on the culvert removals, in-stream work and stream crossings was limited to June 15 to September 1, 2012.



Picture 4. Road 30000360 at MP 0.43; water from ditch line flowing to fish stream at crossing

The channels were stabilized with rock that armored the channel banks to minimize erosion. The contract included laying the slopes back to a 2:1 slope gradient on the stored crossings without OHV traffic. The excavated rock was placed roughly three to five feet from the slope of the water crossings and spread on the road surface to prevent ravel into the stream crossings. One culvert was left in place, near the end of the road. This culvert may have been accidentally left in place. Water bars were excavated in the road and no water was noted in the structures. Most of water bars and cross drains installed served to provide water transport and maintain natural drainage patterns. The contractor added ditch blocks to direct the water through the excavated crossings. These ditch blocks were not required in the contract but contributed to limit diversion potential. Two water bars were not storm proofed with excavated inlets and outlets that connected to the ditch line.

Project inspection included field observation during road storage construction. There were no spills or leaks of equipment relative to the SPCC plan reported. No signs of contamination were noted. The overall

road prism was in good condition and showed only minimal sheet wash and water rills on the road near the stream crossing at MP 0.43. Ponded water was noted along the road between MP 0.43 and 0.44. The ponded water was shown along both sides of the road just past MP 0.44 for roughly 40 feet. Road maintenance should have been completed during the closure to mitigate the ponding by excavating a cross drain through the road prism at this site. Besides the noted problems near MP 0.44, there was no other evidence of sediment transport or water diversion on the running surface of the road.

Effectiveness monitoring completed by the IDT noted that the closure has eliminated the standard vehicle traffic on the road beyond MP 0.09. There is little erosion evidenced on the road and sediment transport was minimized. No diversion potential was noted relative to these crossings. The re-vegetation standard was met on the road. Grass seed had germinated and natural vegetation is growing on the stream banks. There was minimal evidence of stream cutting, natural channel re-alignment, sediment transport and deposition in the stream.

A spur road was shown off the 3000362 that extended off the 3000360 road. This road still had a culvert in place although the bridge further down the 3000362 was removed. By closing the 3000360 and removing the culverts, the 3000362 road is isolated. Concern was expressed that if maintenance is necessary on the culvert, the work will be difficult to accomplish.

Recommendations

No specific corrective actions were identified, although a few notes on problems to follow up on to completion of the contract. Monitoring will be required to check the status of the water ponded near MP 0.44 and culvert at the end of the road. Adaptive management actions that are recommended by the IDT to improve implementation include:

- Close roads with a physical barrier particularly during implementation of C closures. The road should be signed or blocked to eliminate traffic. Recommendations follow to address this in the contracts.
- Additional cross drains should be added where the water is ponded along the road during storage.
- Steps should be taken to ensure that roads are not left untreated and isolated from specified road closure or storage. Recommendations follow that the culverts or stream crossing structures should be considered for removal on spur roads or specified roads that initiate off closed or stored roads.

Overall the road was stored in good condition with minimal signs of erosion. The ditch blocks constructed on the water bars will serve to limit diversion potential. The road bed was seeded when the road was closed. The seed germinated to stabilize the road bed. The stream crossings were functioning well to transport water across the road, although an additional cross drain adjacent to MP 0.44 was needed.

Road 3000382

Road 3000382 is roughly two and one half miles south of Sweetwater Lake and roughly one third mile east of Logjam Creek. Road 3000382 is accessed off the 3000380 road roughly 0.4 miles from the junction of the 3000380 road and 3000000. This junction is roughly 0.6 miles past the initiation of the 3000000 in central Prince of Wales Island. The streams crossing this road are tributaries of Logjam Creek that flows to Sweetwater Lake. The road trends southward then curves westward toward Logjam Creek. The coordinates of a reference point on the road are N 55 deg 53'57.78 " W 132 deg 59 ' 53.39". The class II stream crossing, and proximity to Logjam Creek and characteristics of the stored road were

considered in selecting the site to monitor. The focal reach of the monitoring was MP 0.154, although the IDT reviewed the entire road segment. The road segment was stored to minimize resource impacts due to reduced budget for road maintenance.



Picture 5. Road 3000382; cross drain at MP 0.1

Three culverts were removed from the road and cross drains excavated at these sites. Two culverts were left in place on the road. Water bars were also excavated along the road to limit water eroding the running surface of the road. The site at MP 0.154 was selected for focused monitoring since this stream was the only fish bearing stream crossing on the road and showed the highest potential for resource concerns. The stream at MP 0.154 is an uncataloged fish bearing tributary of Logjam Creek. This stream was documented as a Class II stream containing cutthroat and Dolly Varden. The crossing at MP 0.154 is a moderate – low gradient stream with mixed control (MMS channel type). The crossing showed water flowing through the culvert and ponded at the outlet. Wetland vegetation was shown at the outlet and the channel is a low gradient meandering channel that traverses through a wet area. The inlet showed gravels and cobbles substrate in a one foot wide channel of roughly six to eight percent slope gradient.



Picture 6. Culvert inlet at MP 0.154



Picture 7. Culvert outlet at MP 0.154

ADF&G Title 16 Concurrence for the in-stream work was documented in an August 17, 2012 letter. This culvert was scheduled to be removed; however, was not pulled at the time of the monitoring review. The stream was delineated as a red fish pipe on the road condition survey. The red fish pipe designation identified the site where fish could not pass through the culvert at all flows. The Contracting Officer Representative (COR) and Engineer on the project required the Operator to return to the site to remove this culvert.

No closure devices were noted at the intersection of the road and 3000380 Road. The initial excavated culvert at MP 0.10 served to close the road, since vehicle traffic could not ford the crossing. The contractor had not completed work on this road. Work had been ongoing on this road earlier in the month and additional work was found to be necessary at both MP 0.14 and MP 0.154. This road was designated Road Management Objective 1 with foot traffic only. The Forest had on file a hazardous communication / waste mitigation plan and the contract had a Spill Prevention Countermeasure and Control (SPCC) plan to address any petroleum spills.

An erosion control plan was not developed for the contract; however, the standard erosion control specifications were implemented. Seeding of bared soils to prevent erosion was required. Turf establishment was required in the contract. The seeding had not been completed at the time of the monitoring trip.

Water bars across the road prism were constructed to limit water from running on the road surface and carrying sediment to the streams. There was in-stream timing specified for the road storage work on this road associated with the Class II stream crossing. The road work on the fish bearing stream crossing at MP 0.154 was limited to June 15 to September 1, 2012. The Forest immediately requested a variance for the timing on this road to complete removal of the culvert at MP 0.154. The ADF&G habitat biologist participating on the monitoring review agreed in the field that he would support the variance request.

Stream crossing culverts were removed per the culvert removal typical. Most of the water bars and cross drains installed served to provide water transport and maintain natural drainage patterns. The contractor added ditch blocks to direct the water through the excavated crossings. These ditch blocks were not required in the contract but contributed to limit diversion potential.



Picture 8. Cross drain at MP 0.1; looking downstream

At the stream crossings where the culverts had been removed, the channels showed some minor channel adjustments. The slopes on the crossing at MP 0.1 showed some raveling with cobbles and 8- 10 inch rocks in the stream channel. These rocks did not obstruct flow and the crossing was functioning to transport water. The contract included laying the slopes back to a 2:1 slope gradient on the stored crossings. The excavated rock was spread on the road surface to minimize ravel into the stream crossings. The culvert removed from the site at MP 0.14 was at a small non-fish bearing wetland stream. The excavation was relatively shallow and the height deviation between the stream channel and road was only about three to four feet. The contractor had excavated a ditch block to direct water to flow through the crossing; however, the operator had constructed the ditch block on the upslope side of the inlet. The COR was going to direct the Contractor to reconstruct or remove the ditch block so the water in the ditch would flow to the cross drain. The cross drain at MP 0.4 was functioning well to transport water across the road prism. The slopes at this site were relatively low in height of roughly four feet and laid back to a shallow slope gradient. This stream was a minor Class IV stream that was roughly one foot wide and transported water across a wet area. The culvert at MP 0.41 was left in place even though the contract specified removal and was functioning to transport water across the road prism. The inlet of this culvert had been cleaned by the contractor and a pool excavated to facilitate drainage and minimize the potential from plugging.



Picture 9. Crossing at MP 0.14 ditch block

Project inspection included field observation during road storage construction. There were no spills or leaks of equipment relative to the SPCC plan reported. No signs of contamination were noted. The overall road prism was in good condition and showed no erosion.

Effectiveness monitoring completed by the IDT noted that the closure has eliminated the standard vehicle traffic on the road beyond MP 0.1. There was little erosion evidenced on the road and sediment transport was minimized. No diversion potential was noted relative to these crossings. The re-vegetation standard was not applied yet, although seeding was planned on the road. There was minor evidence of stream cutting, sediment transport and deposition in the stream at MP 0.154 otherwise no erosion was noted. The bared soil at the site at MP 0.14 may result in some minor slumping of the excavated cut slope. The operator had excavated a ditch along the road adjacent to a wetland and a 3 foot cut slope of organic soil was bared.

Recommendations

No specific corrective actions were identified, although a few notes on problems to follow up on to completion of the contract. Monitoring will be required to check the status of the removal of the red fish pipe at MP 0.154. Adaptive management actions that are recommended by the IDT to improve implementation include:

- Close roads with a physical barrier particularly during implementation of C closures. The road should be signed or blocked to eliminate traffic. Recommendations follow to address this in the contracts.
- Additional inspection should be completed to ensure that the culverts at Class I and II stream crossings that have concurrence documents specifying removal during timing windows are completed as listed.

Overall the road was stored in good condition with minimal signs of erosion. The ditch blocks constructed on the cross drains will serve to limit diversion potential. The road bed should be seeded when the road storage is completed. The COR reported that the culvert at MP 0.154 had been removed and the work to reconstruct the ditch block at MP 0.14 was completed in the week following the monitoring trip. The stream crossings were reported to be functioning well to transport water across the road.

Road 2000454

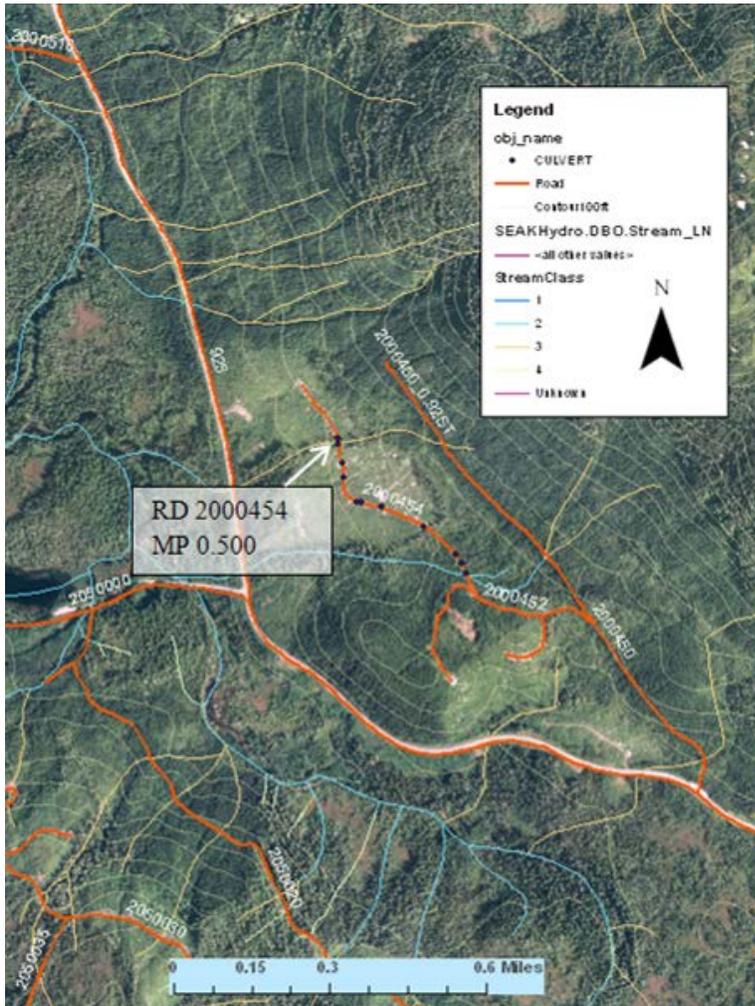
Road 2000454 is roughly three miles northwest of the Control Lake Junction of the Forest Highway (FH) 925/ 929 in central Prince of Wales Island. The road is located off the Forest Development Road (FDR) 2000450 system, which is roughly one half mile southeast of the FH 925/ FDR 2050 junction. FDR 2000450 trends northwestward roughly paralleling FH 925. Approximately 0.4 miles beyond the start of FDR 2000450, FDR 2000452 initiates and trends north- northwestward. Following FDR 2000452, FDR 2000454 initiates 0.24 miles at an intersection off this road and trends northwestward. The coordinates of a reference point along the road are N 55 deg43.965' W 132 deg57.330. The Class II stream crossing and proximity to Staney Creek were considered in selecting the site to monitor. The focal reach of the monitoring was MP 0.050, although the IDT reviewed the entire road segment. The road segment was stored to minimize resource impacts due to reduced budget for road maintenance. The inspection notes showed that the road was stored on August 1, 2011.

There was one culvert on a Class II stream, four culverts on Class IV streams and five ditch relief culverts shown on the road prior to storage. Three culverts were removed from the road and cross drains excavated at these sites. A culvert at MP 0.45 was included in the storage contract for removal; however, was left in place. The stream at MP 0.050 was an uncataloged Class II tributary stream to the Staney Creek stream system. This stream contains cutthroat and had in-stream timing restrictions on the storage. A November 30, 2010 ADF&G Title 16 Concurrence letter specified an in-stream work window from June 25-September 1. The cross drains at MP 0.09 and MP 0.044 provided channel flow for Class IV streams. The road was a relatively flat road that showed rolling grade in elevation. The fill from the excavated culverts was spread along the running surface of the road.

The 48 inch culvert removed at MP 0.050 was the focal point of the monitoring. The side slopes on the crossing at MP 0.050 were laid back to the 2:1 to 3:1 slopes as shown on the contract drawings on the near side of the road. The slopes were roughly 6 feet high. The stream is a small meandering AF/ HC channel that was designated as a resident cutthroat fish stream. The culvert had been evaluated prior to storage and was documented in the road condition survey (RCS) to not pass fish at all water flows. The stream was roughly two to three feet wide and six inches deep at the time of the monitoring. The outlet of the stream, beyond the cross drain, showed terraced pools. The inlet showed ponded water in a low gradient wet area that was roughly one foot deep. The channel upstream of the culvert adjacent to the

road showed organic soils in the banks and wetland vegetation. The stream gradient at the removed crossing was roughly two percent slope gradient and water was flowing through the crossing. The substrate showed cobbles to boulders. There was some rock from the road fill that raveled into the stream; however, no erosion was noted on the banks.

Figure 2. Road 2000454





Picture 10. Lateral view of cross drain at MP 0.05



Picture 11. Outlet of cross drain at MP 0.05

At MP 0.090, an 18" culvert had been removed. The water quality stream crossing at MP 0.090 was roughly three feet wide and two to four inches deep. The slopes were laid back at 1.5: 1 to 2:1 slopes. The slopes were roughly four feet high at the cross drain and the material excavated from the culvert site was spread on the running surface of the road. The excavated material was more than five feet from the top of the excavated slope of the cut for the cross drain. The stream flowed in a shallow, low gradient

MM channel that showed wetland vegetation. The gradient of the cross drain was roughly two to four percent slope. The substrate of the channel showed cobbles and boulders that raveled from the excavated fill. The cross drain was functioning to transport water and showed no signs of erosion or sediment transport.



Picture 12. Over steep slope at MP 0.44

Continuing up the road, the next culvert removed at MP 0.44 was a 36" culvert. The stream at this crossing was a shallow channel. The water quality stream was roughly one to two feet wide and three to four inches deep with a gradient of two to four percent slope. This stream was located at a slightly increased elevation and the height road cut fill in the cross drain was roughly ten feet high. The slopes of the excavation were steeper and showed a slope gradient of 1 horizontal: 1 vertical. Some erosion was noted on the cut slopes in over-steep sections near the stream as some of the fill material was slumping into the stream. There were some fines shown in the raveling and slumping slopes of the excavation. The channel substratum was primarily road fill of cobbles and gravel with a few boulders.

The culvert at MP 0.45 was specified in the contract for removal; however, was left in place. This Class IV stream showed minimal potential for sediment transport or diversion.

No closure devices were noted at the intersection of the road and 2000452 road although the 2000452 road was closed. There is no ATV/ OHV access provided on this road. The road was put in storage roughly one year prior to monitoring and was designated Road Management Objective 1. The Forest had on file a hazardous communication / waste mitigation plan and the contract had a Spill Prevention Countermeasure and Control (SPCC) plan to address any petroleum spills.

An erosion control plan was not developed for the contract; however, the standard erosion control specifications were implemented. Seeding of bared soils to prevent erosion was required. Turf establishment was required in the contract. The seed had germinated on the road although the grass was sparse in places.

Water bars across the road prism were constructed to limit water from running on the road surface and carrying sediment to the streams.

The channels were stabilized with road fill material to minimize erosion. The contract included laying the slopes back to a 2:1 slope gradient on the stored crossings without OHV traffic. The excavated rock was placed roughly three to five feet from the slope of the water crossings and spread on the road surface to prevent ravel into the stream crossings. Water bars were excavated in the road and no water was noted in the structures. Most of water bars and cross drains installed served to provide water transport and maintain natural drainage patterns.

Project inspection included field observation during road storage construction. There were no spills or leaks of equipment relative to the SPCC plan reported. No signs of contamination were noted. The overall road prism was in good condition. Besides the noted problems near MP 0.44, there was no other evidence of sediment transport or water diversion on the running surface of the road.

Effectiveness monitoring completed by the IDT noted that the closure has eliminated the standard vehicle traffic on the road. There is little erosion evidenced on the road and sediment transport was minimized. No diversion potential was noted relative to these crossings. The re-vegetation standard was met on the road. Grass seed had germinated and natural vegetation is growing on the stream banks. There was minimal evidence of stream cutting, natural channel re-alignment, sediment transport and deposition in the stream.



Picture 13. Cross drain at MP 0.09 and road corridor ahead

Recommendations

No specific corrective actions were identified as necessary on this road, although notes indicated that the contractor inspectors should focus the contractor to remove the culverts shown in the contract and lay the slopes back to the gradients shown on the drawings.

Adaptive management action recommended by the IDT to improve implementation and effectiveness was primarily focused on reconstruction of the natural stream channels at the crossings. The group recommends the Forest provide bankfull width and gradient information to the contractor so the contractor can excavate the cross drains at the streams to closer match natural conditions. The bankfull width information would help the contractor ensure that the crossing is wide enough to not constrict the flow. Provided the stream gradient information, the contractor could excavate the fill from the channel to maintain the natural stream gradient.

Road 2000530

Road 2000454 is roughly eight miles northwest of the Control Lake Junction of the Forest Highway (FH) 925/ 929 in central Prince of Wales Island. The road is approximately six miles east of the confluence of Staney Creek in Tuxekan Passage. The road is located off the FH 925. FDR 2000450 trends northeastward roughly paralleling FH 925 in low elevation terrain along a tributary to Staney Creek. The class II stream crossings and proximity to Staney Creek were considered in selecting the site to monitor. The focal reach of the monitoring was MP 0.26, although the IDT reviewed the entire road segment. The road segment was stored to minimize resource impacts due to reduced budget for road maintenance. The inspection notes showed that the road was stored in July 2011 and inspected August 1, 2011. Concurrence for the in-stream work was documented in a November 30, 2010 letter from ADF&G.



Picture 14. Cross drain at MP 0.26

Three culverts on Class II streams and five ditch relief culverts were shown on the road prior to storage. The culverts were removed as part of road storage. This road was designated as a Category C closure where all culverts were to be removed from the road. The culverts at MP 0.110, 0.150 and 0.260 were

crossings of the same Class II stream that meandered across the road. This stream showed cutthroat and Dolly Varden in the reaches that crossed the road at MP 0.110 and 0.150. The reach at MP 0.260 showed Dolly Varden but no cutthroat. There was no in-stream timing requirement specified on the removal of the structures on this road due to primarily to distance from anadromous fish habitat and minor depth of fill and low potential for impacts to fish habitat as part of removal. The ADF&G Title 16 concurrence letter dated November 30, 2010 documented this to be the case. The cross drains at MP 0.012, 0.152, 0.3, 0.33, and 0.39 were ditch relief structures. The road was a relatively flat road that showed rolling grade in elevation. The fill from the excavated culverts was piled three to five feet from the top of the cut slope and extended in piles along the running surface of the road.



Picture 15. Removed Class II stream crossing at MP 0.26; inlet

The 48 inch culvert removed at MP 0.260 was the focal point of the monitoring. The side slopes on the crossing at MP 0.260 were laid back to the 2:1 slopes as shown on the contract drawings. The fill was spread in stepped terraces along the road. The slopes were roughly two to three feet high. The stream is a small meandering channel that was designated as a Class II stream with Dolly Varden presence. The culvert had been evaluated prior to storage and was documented in the road condition survey (RCS) to not pass fish at all water flows. The stream was roughly four to five feet wide and six to ten inches deep at the time of the monitoring. The outlet of the stream, beyond the cross drain, showed pooled water in a low gradient channel in a wet area. The inlet showed a gravel bar and low gradient channel that was one to three inches deep. The channel upstream of the culvert adjacent to the road showed a one foot wide meandering channel that was incised roughly four to six inches. Organic soils were shown in the in the banks and wetland vegetation was noted along with a mixed cedar second growth stand. The gradient of the cross drain was roughly 0.5- one percent slope gradient and water was flowing through the cross drain. The substrate showed gravels to cobbles. There was some rock from the road fill that raveled into the stream; however, no erosion was noted on the banks. The gravel bar consisted of road fill material from the excavation. Grass was noted growing on the road surface and cut slopes of the excavation.

At MP 0.110, a 60" culvert had been removed. The Class II stream crossing at MP 0.110 was roughly two feet wide and two to four inches deep. The slopes were laid back at 2:1 slopes. The slopes were roughly three feet high at the cross drain and the material excavated from the culvert site was piled roughly five feet from the top of the cut slope and spread in piles on the running surface of the road. The

stream flowed in a shallow, low gradient MM channel that flowed to a wetland. The stream was designated as a Class II stream with cutthroat and Dolly Varden. The gradient of the cross drain was roughly one to two percent slope. The substrate of the channel showed gravels and cobbles from the excavated fill. The cross drain was functioning to transport water and showed no signs of erosion or sediment transport.



Picture 16. Cross drain at MP 0.15

Continuing up the road, the next culvert removed at MP 0.150 was a 36" culvert. The stream at this crossing was a shallow, side slope channel on the inlet that flowed to a wetland at the outlet. The Class II stream was roughly one to two feet wide and two to three inches deep with a gradient of two to four percent slope. This stream was located at a slightly increased elevation and the height road cut fill in the cross drain was roughly five feet high. The slopes of the excavation were steeper and showed a slope gradient of 1 horizontal: 1 vertical to 1.5 horizontal: 1 vertical. Some erosion was noted on the cut slopes in over-steep sections near the stream as some of the fill material eroded into the stream. There was a minor amount of fines shown in the raveling slopes of the excavation. The channel substratum was primarily road fill of gravel and cobbles.

Waterbars were excavated where culverts were removed culverts that had functioned as ditch relief structures. These cross drains functioned as water bars and limit transport of water on the road surface as well as provide for transport of water from intermittent streams and wet areas. The water bars showed some ponded water in the cross drains and slopes were generally 2:1 to 1.5: 1 horizontal to vertical. The road fill material that was excavated from the culvert sites was piled near the excavated cross drains along the road surface. The height of the excavated cut banks varied with the road gradient. The height of the slopes on the water bars near the beginning of the road in the lower gradient terrain was approximately three feet and roughly five feet in the slightly higher gradient terrain. There was minimal erosion noted in the cross drains evidenced by fines in the base of the cross drain. Isolated lens of fines were shown in the fill in the cut slopes and had eroded from sheet wash into the cross drains. The excavation cut banks and roadbed had been seeded and grass had germinated.

No closure devices were noted at the intersection of the road and FH 925 road although the 2000530 was closed at the initial culvert removed at MP 0.011. There is no ATV/ OHV access provided on this road. The road was put in storage roughly one year prior to monitoring and was designated Road Management Objective 1 and closure class C. The Forest had on file a hazardous communication / waste mitigation plan and the contract had a Spill Prevention Countermeasure and Control (SPCC) plan to address any petroleum spills.

An erosion control plan was not developed for the contract; however, the standard erosion control specifications were implemented. Seeding of bared soils to prevent erosion was required. Turf establishment was required in the contract. The seed had germinated on the road although the grass was sparse in places.



Picture 17. Cross drain/ water bar past MP 0.23

Water bars across the road prism were constructed to limit water from running on the road surface and carrying sediment to the streams as well as provide cross drainage in wet areas and for intermittent streams. There was timing on the road storage work on the class II stream crossings. The road work on the class II stream culvert removals, in-stream work was limited to June 15 to September 1, 2011.

The channels were stabilized with road fill material to minimize erosion. The contract included laying the slopes back to a 2:1 slope gradient on the stored crossings without OHV traffic. The excavated rock was placed roughly three to five feet from the slope of the water crossings and spread on the road surface to prevent ravel into the stream crossings. Water bars were excavated in the road and water was noted in the structures. The water bars and cross drains installed served to provide water transport and maintain natural drainage patterns.

Project inspection included field observation during road storage construction. There were no spills or leaks of equipment relative to the SPCC plan reported. No signs of contamination were noted. The overall road prism was in good condition. There was no evidence of sediment transport or water diversion on the running surface of the road.

Effectiveness monitoring completed by the IDT noted that the closure has eliminated the standard vehicle traffic on the road. There is little erosion evidenced on the road and sediment transport at the cross drains was minimized. No diversion potential was noted relative to these crossings. The re-vegetation standard was met on the road. Grass seed had germinated and natural vegetation is growing on the stream banks. There was no evidence of stream cutting and natural channel re-alignment; and minimal evidence of sediment transport and deposition in the streams.

Recommendations

No specific corrective actions were identified as necessary on this road, although notes indicated that the contractor inspectors should focus the contractor to remove the culverts shown in the contract and lay the slopes back to the gradients shown on the drawings.

Adaptive management action recommended by the IDT to improve implementation and effectiveness was primarily focused on reconstruction of the natural stream channels at the crossings. The group recommends the Forest provide bankfull width and gradient information to the contractor so the contractor can excavate the cross drains at the streams to closer match natural conditions. The bankfull width information would help the contractor ensure that the crossing is not too wide so the natural velocity of the stream flow is maintained. Provided the stream gradient information, the contractor could excavate the fill from the channel to maintain the natural stream gradient. Additionally, the IDT recommended that the slope of the reconstructed fills should be shallower to provide for recreation access. The shallower slopes are needed to accommodate foot traffic over the piles of excavated road fill.

Conclusions

The Prince of Wales Island Road Storage monitoring trip highlighted a few important conclusions and action items. These items are listed briefly below:

- The list of completed roads from INFRA was not consistent with the contract inspection records. In order to complete a stratified selection of roads for monitoring, it is necessary that the office files, INFRA and contract files show consistent status. There should be an accurate record of the status of the road closure.
- Inspection of the roads, selected for IDT review, did not occur prior to the monitoring trip. The limited inspection contributed to problems identified on some of the roads reviewed. The culverts, designated for removal due to concerns with fish passage, should be removed as directed. The culvert on the 3000382 was removed following the BMP monitoring trip. The ditch block on the cross drain at MP 0.14 on this road was reconstructed to direct water through the cross drain. The COR followed up to have the contractor return to the site to complete removing the structure and reconstructing the ditch block. On the 3000375, the work to remove the culvert with fish passage concerns was completed after the monitoring review. Concurrence for completion of this work outside the timing window was requested and granted from ADF&G.
- Roads that are designated as closed should have some closure device or water bar at the beginning of the road. On most of these roads, the road is drivable to the first culvert removed. This typically results in an unsafe turnaround situation.
- Following through to implement road storage and removal of structures that are designated by the fish biologists and hydrologists is essential. The Forest has worked with ADF&G to request concurrence on the structure removal, so it is essential that we check that this work is completed. Additional inspection of the roads, particularly the roads where there are class I and II stream crossings is necessary.