

## Appendix B

# Tongass Best Management Practice Implementation and Effectiveness Monitoring Report: Fiscal Year 2012

**Background:** Implementation of Soil and Water standards and guidelines is necessary to maintain soil productivity and water quality. The Soil and Water standards and guidelines are implemented as Best Management Practices (BMPs) described in FSH 2509.22. Region 10 Soil Quality standards are documented in FSM 2554. Soil conservation practices are practices used to ensure that ground-disturbing activities will meet the R-10 Soil Quality standards. Typical soil conservation practices include log suspension requirements in timber harvest units and the use of full-bench and end-haul road construction techniques on landslide-prone terrain. Implementation monitoring evaluates whether or not soil conservation practices were required and implemented. Effectiveness monitoring determines whether or not the soil conservation practice used kept the ground-disturbing activity within the R-10 Soil Quality standard.

The State of Alaska Water Quality Standards set standards for chemical, physical, and biologic parameters of waters on National Forest System Lands. The Forest Service in Region 10 uses Best Management Practices and site-specific prescriptions to meet State of Alaska Water Quality Standards when implementing ground-disturbing activities on National Forest System lands.

The Best Management Practices (BMPs), described in the Soil and Water Conservation Handbook (Forest Service Handbook 2509.22), define practices that protect soil and water resources. The Soil and Water standards and guidelines define site-specific measures to protect the resources. These standards and guidelines were monitored following a methodology described in the National BMP pilot guidelines. The FY 2012 BMP Monitoring Report provides details on how monitoring was conducted. Interdisciplinary Team trip reports detail individual BMP trip reviews. An interagency team of representatives from the Forest Service and Alaska Department of Environmental Conservation selected specific BMPs to be monitored, based upon potential risk factors to soil and water resources. Best Management Practices, described in the Alaska BMP Handbook, are currently in the process of revision to be updated with current terminology and practices relevant to road construction, road decommissioning and road storage.

### Best Management Practice Implementation and Effectiveness

The Forest Plan Soil and Water Standards and Guidelines, in conjunction with BMP's, define site-specific measures to protect soil and water resources. Implementation and effectiveness of these standards and guidelines was monitored following a method described in the National BMP Monitoring Guidance. The Tongass participated in a pilot of the National BMP Monitoring methodology and forms.

The BMP implementation and effectiveness monitoring was completed through interdisciplinary team (IDT) monitoring of a sample of ten to fifteen percent of the roads constructed/ reconstructed and units harvested in 2012, and some of the roads stored and decommissioned over the past eight to ten years. BMP Monitoring was also conducted on a few recreation sites and trails reconstructed and used in 2012. Additionally, one mine site was monitored. Routine BMP implementation monitoring on 100 percent of the roads, units and recreation sites/ trails is completed during the contract inspection and force account construction process and documented through successful final inspection of the contracts. The IDT monitoring was conducted by a team of representatives from the Forest Service, National Marine Fisheries Service and State agencies. This team included sale administrators, engineers, foresters, planners, and resource specialists from soils, water, fisheries and recreation. The IDT monitoring provides opportunity to discuss the implementation of the Best Management Practices across resource and

agency groups.

The IDT monitoring was conducted on a stratified sample of units, roads, trails and developed recreation facilities. Due to a low level of timber harvest and associated road construction, the number of units harvested and roads constructed/ reconstructed in fiscal year 2012 were limited.

During the IDT review the sites visited in fiscal year 2012 are noted by district below.

**Admiralty Ranger District:** August 14-15, 2012; Admiralty Island- Greens Creek Mine

**Ketchikan Ranger District:** August 20, 2012; Revillagigedo Island- Naha River Trail

**Ketchikan Ranger District:** August 23, 2012; Revillagigedo Island- Winstanley Island Cabin, McDonald Lake cabin, and Leduc Lake

**Thorne Bay Ranger District:** August 28-29, 2012; Prince of Wales Island- Slake Timber Sale units 573-69, 573-67B, & 573-73D and road 3030720 reconstruction.

**Ketchikan Ranger District:** September 5 & 6, 2012; Shoal Cove Road Storage 8400000 & 8435000, Mop Point Timber Sale road 8430200

**Sitka Ranger District:** September 12, 2012; Kruzof Island, Eagle Creek Road Storage- 7595

**Petersburg Ranger District:** September 14, 2012; Mitkof Island- Petersburg Lake Trail & cabin

**Petersburg Ranger District:** September 12, 2012; Mitkof Island, Road Storage; roads 40007, 6200, 6226, 6280

**Petersburg Ranger District:** September 18, 2012; Kuiu Island, Road Storage; road 6409

**Ketchikan Ranger District:** September 17, 2012; Boundary II Timber Sale unit 5

**Thorne Bay Ranger District:** September 20- 21, 2012; Prince of Wales Island- Wolf Pup/ Staney Creek- Logjam Road Storage roads 3000360, 3000375, 3000382, 2000530, 2000454

**Wrangell Ranger District:** September 25, 2012; Zarembo Island – Road storage- Whale Trail road 6587

Evaluation of the BMP monitoring for fiscal year 2012 shows that sixteen units were in the harvest pool of partial harvest and clear cut units at the time of the BMP review and available for monitoring. A total of 31 partial and clear cut units that were a combination of single tree selection, partial harvest and clear cut in the silviculture Forest Activity Tracking System (FACTS) data base. A number of the units were reported in FACTS as harvested in FY12. The reporting for the FACTS data base is premised on the units being final completed which often involves final acceptance of groups of units. The monitoring is focused on the units that are yarded and stream cleanout completed although they may not yet be in FACTS at the time of the monitoring. This year the IDT monitored four units of the 39 completed, so the monitoring was conducted on more than ten percent of the units harvested.

Considering road work on the Tongass, five hundred forty-two road segments were stored or decommissioned and reported in the roads INFRA data base and one road reconstructed in 2012. Significant updates were made in the database since FY11, so the number of roads reported in INFRA reflects the roads in the ATM plans. The number of roads in the database increased from 160 in FY11 to 542 in FY12. The road unit pool included roads that were closed a few years ago to ensure the effectiveness monitoring was conducted on a representative sample. In FY11 and FY12, twenty-six roads were reported as closed. This year, the IDT monitored fifteen roads; fourteen stored roads and one reconstructed road. A few roads were closed more than five years ago were added to monitor longer term effectiveness. Four of the roads monitored by the IDT were closed over eight years ago.

This year, the Forest continued to pilot the national BMP forms monitoring of recreation sites and added a pilot for mines. Two trails, three cabin recreation sites and four dispersed recreation sites were selected for monitoring. These recreation projects had been constructed and reconstructed within the past 2 years

or had been actively used in the past year. In FY12, the forest piloted the national BMP Monitoring form for mines. There are 2 operating mines on the Forest. The IDT reviewed one mine site.

The 2012 monitoring results show that the Tongass National Forest is successfully implementing the Standards and Guidelines for protection of Soil and Water Resources in most cases. There were some problems noted with roads that were closed but not yet stored, a road that was closed and used as an OHV trail, culvert removal from class II streams, and slopes/ gradient on cross drain excavations. The recreation trail and site monitoring showed an increased emphasis on BMP awareness is needed.



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**Picture 1.** Slake Timber Sale unit 67B

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### **Monitoring Context**

Planning for some of the roads and units monitoring in 2012 was completed before the Soil and Water Conservation Handbook was revised and effective in 2006. The 1996 and 2006 Soil and Water Conservation Handbook includes improving wetlands management direction, considering stream buffer wind throw, and generally making Forest Service BMPs consistent with State Forest Practices Regulations. The 1997 Tongass Land Management Plan FEIS and the revised Forest Plan Standards and Guidelines resulted in new stream class definitions, and stream protection measures required for each stream class and channel type. Buffer protection of Class III streams was defined in 1997. The Standards and Guidelines for soil and water resources in the 1997 Forest Plan have not significantly changed and were clarified in the most recent Forest Plan amended in 2008.

The timber sales, roads, and recreation projects monitored in 2012 were developed under standards and guidelines consistent with the 2008 Amended Forest Plan. The Boundary Timber Sale unit as well as the Slake Timber Sale units monitored in 2012 were initially planned under 1997 Forest Plan Standards and Guidelines but reviewed for consistency and harvested under the 2008 Amended Tongass Forest Plan. The roads monitored were a combination of roads reconstructed for timber sales as well as maintained and stored roads. The reconstructed timber sale roads were planned under the 1997 Standards and Guidelines but reviewed for consistency and planning – finalized and implemented under the 2008 Amended Forest Plan. The roads were closed under ATM plans consistent with the 2008 Amended Forest Plan. The trails and recreation sites and mine monitored during 2012 were consistent with the Amended 2008 Forest Plan.

### **AK Regional BMPs Monitored in FY 2012**

- BMP 12.5 Wetlands Protection Measures
- BMP 12.6/ 12.6a Riparian Area Designation & Protection/ Buffer Zone Design and Layout
- BMP 12.7/ 14.5/14.8 Measures to Minimize Surface Erosion
- BMP 12.8/ 12.9 Oil Pollution Control Measures
- BMP 12.17 Revegetation of Disturbed Areas
- BMP 13.5 Identification and Avoidance of Unstable Areas
- BMP 13.9 Yarding Systems to Protect Soil/ Water Resources
- BMP 13.10 Landing Location and Design
- BMP 13.11/ 13.14/ 14.5 Erosion Control Measures for Units & Temporary Roads
- BMP 13.16 Stream Channel Protection
- BMP 14.6 Timing Restrictions for Construction Activities/ Fisheries Prescription
- BMP 14.7/14.12 Measures to Minimize Mass Failures/ Control of Excavation & Sidecast
- BMP 14.9 Drainage Control Structures to Minimize Erosion & Sedimentation
- BMP 14.14/ 14.17 Design & Installation of Bridges and Culverts
- BMP 14.18 Control of Rock Pit Sediment
- BMP 14.20/ 14.22 Road Maintenance Access Management
- BMP 14.26/ 14.27 LTF Surface Erosion Control Plan, Storm Water Pollution Prevention Plan
- BMP 16.1 Recreation Facilities Planning and Location
- BMP 16.4 Trail Construction & Maintenance
- BMP 16.5 Management of Off-Highway Vehicle Use
- BMP 17.1 Mining Site Conditions, Planning and Design
- BMP 17.3 hard Rock Mining

### **National Core BMPs Monitored in FY 2012**

- Road 1 Travel management Planning and Analysis
- Road 2 Road Location and Design
- Road 3 Road Construction and Reconstruction
- Road 4 Road Operations and Maintenance
- Road 5 Temporary Roads
- Road 6 Road storage and Decommissioning
- Road 7 Stream Crossings
- Veg 1 Vegetation Management Planning
- Veg 2 Erosion Prevention and Control

Veg 3 Aquatic management Zones  
Veg 4 Ground Based Skidding and Yarding Operations  
Veg5 Cable and Aerial Yarding Operations  
Veg 6 Landings  
Rec 1 Recreation Planning  
Rec 2 Developed Recreation Sites  
Rec 3 Dispersed Use Recreation  
Rec 4 Motorized and Non-Motorized Trails  
Min 1 Minerals Planning  
Min6 Mine waste Storage sites, Settling Ponds



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**Picture 2.** Slake Timber Sale unit 73D

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During IDT monitoring, the group noted soil, visual, timber, stream and buffer characteristics relative to the management practices. The new national BMP forms focus on implementation relative to streams with minimal focus on soil disturbance. The IDTs evaluated both protection of water and soil resources and noted soil disturbance in the comments on the Tongass BMP Implementation Monitoring forms. The focus issues and relative characteristics monitored are listed below:

- Running skyline, cable logging: streams, buffers, wetlands, and soil disturbance
- Shovel logging: soil disturbance, wetlands, buffers
- Steep slopes: minimizing soil disturbance
- Stream identification and transition zones from Class I, and II stream to Class III /IV streams and protection, buffer implementation

In the road review, the IDT looked at the reconstruction and construction. The focus issues and relative characteristics monitored are listed below:

- Timber roads: stream channel protection, culvert removal and water bars, sediment control and seeding
- Stored specified roads: slope gradient on culvert removal sites, OHV trails, dips, water bars and seeding
- Mining roads: sediment transport, leachate

In the trails, developed recreation sites (cabins) and dispersed recreation sites, the IDT looked at reconstruction and maintenance. The focus issues and relative characteristics monitored are listed below:

- Trails: stream channel protection, erosion control
- Dispersed recreation sites: erosion control
- Developed recreation sites: erosion control



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**Picture 3.** Prince of Wales Road 3000360 road corridor

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### **Monitoring Overview**

The units monitored in 2012 were harvested under contracts that were included in environmental documents that were either signed after the 1997 Tongass Land and Resource Management Plan then modified to be consistent with the 2008 Amended Forest Plan or signed after the 2008 Forest Plan. Units and roads in the FY 2012 monitoring subset are listed below with their respective environmental impact statement (EIS) or environmental assessment (EA), contract or project name. The public works contracts were all implemented under the current Forest Plan Standards and Guidelines.

**Table 1.** Units Monitored in FY 2012 through BMP Implementation Monitoring Process

<b>Units</b>	<b>Timber Sale; EIS/ EA (decision year)</b>
573-69, 577-67B, 573-73D	Slake TS; Logjam EIS (2009)
5	Boundary II Timber Sale; Boundary EA (2004)

**Table 2.** Roads Constructed/ Reconstructed/ Closed or Stored and Monitored in FY 2012 through BMP Implementation Monitoring Process

<b>Roads</b>	<b>Road Contract; EA/ EIS</b>
8435000, 8430200, 8400000	Ketchikan- Misty Fiords Ranger District ATM Plan EA (2008)
3000360, 3000375, 3000382, 2000530, 2000454	Thorne Bay Ranger District ATM Plan EA (2009)
40007, 6200, 6226, 6280, 6409	Petersburg District ATM Plan EA (2009)
6587	Wrangell District ATM EA (2007)
3030720	Slake TS; Logjam EIS (2009) reconstruction

**Table 3.** Trails and Recreation Sites Constructed/ Reconstructed and Monitored in FY 2012 through BMP Implementation Monitoring Process

<b>Trails &amp; Recreation Sites</b>	<b>District Plan; CE</b>
Petersburg Lake Cabin & Trail	Petersburg Ranger District
Naha Trail & Dispersed Recreation Area	Ketchikan- Misty Fiords Ranger District; Naha Bridge Replacement EA (1990), Naha River Trail Reconstruction EA (1994) Naha Trail Reconstruction CE (2012)
Winstanley Island Cabin & Dispersed Recreation Area, McDonald Lake Cabin & Dispersed Recreation Area, Leduc Lake Dispersed Recreation Area	Ketchikan- Misty Fiords Ranger District

**Table 4.** Mine Sites Operated and Monitored in FY 2012 through BMP Implementation Monitoring Process

<b>Mine Sites</b>	<b>District Plan</b>
Greens Creek Mine	Admiralty Ranger District; Greens Creek EIS (1983, with additional NEPA decisions in 1988 (tailings), 1992 (waste rock disposal), 2003 (tailings expansion))

## Monitoring Results

Due to limitations on harvest and road construction associated with low timber market values and roadless issues, few harvest units and newly constructed roads were in the monitoring pool. At the time of the IDT reviews, the units harvested and roads constructed and final inspected were considered for review and monitored as possible under weather and access constraints.

### Summary

The BMP were fully implemented in the units and on roads constructed and stored under the current contracts. Action plans were developed for the roads to fully implement the BMPs. Corrective actions were implemented on the Tongass in efforts to implement the Best Management Practices. Ongoing contract administration frequently involves minor corrective actions mentioned in the comments on the monitoring forms, contract inspection reports and verbally by the contract administrators. In some cases, corrective action was directed by the sale administrators, contracting representatives, and engineering representatives. Since the timber sales and road storage contracts are still ongoing, work on some of the corrective actions is still ongoing. Some corrective actions on recreation and mining projects were recommended and follow up is still occurring.

Some management actions are needed to improve implementation and effectiveness of the BMPs. The management actions address practices across the Forest that should be considered and evaluated. The management actions that were identified during the BMP monitoring this fiscal year were all relative to roads and OHV trails. Some management actions were described as corrective actions in the monitoring conducted on Prince of Wales and Shoal Cove monitoring trips. Further clarification as to specifically what is a management action compared to a corrective action is needed.

### Corrective actions to improve implementation

Roads & OHV Trails: Corrective actions identified through the IDT monitoring this year as necessary to fully implement the BMPs. Many of the corrective actions were completed as part of routine construction and storage projects. Significant emphasis was placed on the actions listed below.

- Reconstruct fill slopes at culvert removal sites to decrease the gradient and limit slope ravel into stream courses.
- Remove culverts that were left in place but scheduled for removal on class I and II streams as well as class III streams that showed a potential risk for diversion.

Harvest Units: Corrective actions, identified during the IDT monitoring, were primarily implemented prior to the BMP monitoring and is listed below.

- Continue to verify and correct stream locations and stream classifications in units during layout.

Recreation Cabins, Trails & Dispersed sites: Corrective actions identified through the IDT monitoring this year as necessary to fully implement the BMPs are listed below.

- Title 16 Concurrence from ADF&G needs to be requested and granted for work that involves in-stream work on class I and II streams. Streams need to be reviewed in the field by aquatic specialists before the reconstruction or maintenance initiates.

Mines: No corrective actions identified through the IDT monitoring this year were necessary to fully implement the BMPs.



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**Picture 4.** Mitkof road 6200 MP 0.273

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### **Corrective actions to improve effectiveness**

Roads & OHV Trails: Corrective actions identified through the IDT monitoring this year as necessary to improve BMP effectiveness.

- At sites where alluvial fans are crossed, evaluate the stream channel up and down of the road crossing to design the most effective channel to reconnect downslope fish streams and avoid stream diversion created from cascading failures.
- Excavate cross drains to remove fill from fish streams to the natural channel width and gradient so the natural stream flow is maintained.
- Ensure erosion control seeding and turf establishment specifications are implemented before contract closure.

Harvest Units: Corrective actions, identified during the IDT monitoring, were primarily implemented prior to the BMP monitoring as routine work and contributed to improve effectiveness.

- Fluff slash and complete hand work to repair shovel ruts and compacted soils.
- Delete parts of units to minimize potential impacts to streams and unstable slopes.
- Seed and slash cover exposed or bared soil to minimize soil erosion.

Recreation Cabins, Trails & Dispersed sites: Corrective actions identified through the IDT monitoring this year as necessary to fully implement the BMPs and improve effectiveness.

- Remove puncheon from stream channels to maintain the natural stream flow and not constrict or re-route the channels.
- Trail maintenance should include leveling boardwalk, removing roots, and upgrading the trail bridges to meet structural standards to limit potential impacts to soil and water resources from collapse of the structures.

Mines: Corrective actions identified through the IDT monitoring this year as necessary to fully implement the BMPs and improve effectiveness.

- Acid rock drainage in ditches down gradient of the roads should be evaluated and possibly remediated.
- Silt fences and erosion control measures need to be maintained and implemented to control sediment transport from the roads to the streams.
- Leachate should be monitored for pH and specific conductivity. Particularly, leachate flowing in seeps close to streams needs to be monitored for changes. Streams in the watershed downslope of the leachate seeps should be monitored for water quality.

Although some corrective actions were designated on the forms, numerous minor corrective actions were applied in implementing the BMPs and recorded in the comments. Brief summary of the corrective actions are included in the resource specific sections.




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**Picture 5.** Road 3000382 culvert removal site

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### **Management Actions to Improve Implementation**

Roads & OHV Trails: Management Actions identified through the IDT monitoring this year as necessary to improve BMP implementation.

- Increase awareness of potential fish streams not identified in the road condition survey and follow up to request missed streams are verified by an aquatic specialist prior to construction.
- Prioritize roads to assess for physical storage needs and BMP implementation. Fish stream crossings, alluvial fans or other unstable terrain as well as road condition survey data should be evaluated to develop recommendations for storm proofing or structure removal.
- Ensure all roads with fish stream crossings are inspected during construction and removal. Regularly inspect all fish crossing structures left in place for changes in fish passage capacity, maintenance or remediation needs.
- Work with ADF&G to request concurrence on culvert removals on class I and II streams prior to contract development.
- Enforce the specifications associated with the erosion control plans.

## Management Actions to Improve Effectiveness

Roads & OHV Trails: Management Actions identified through the IDT monitoring this year as necessary to improve BMP effectiveness.

- Apply storage practices consistent with ATM unless documented in a change analysis and check consistency with Forest Plan Standards and Guidelines.
- Continue site specific interdisciplinary review and dialog on OHV crossings to develop stream criteria for design, objectives, monitoring plans and maintenance.

## Departure from Full BMP Implementation Summary

In FY 2012, the corrective actions contributed to the BMP implementation in most cases although there were some departures from full implementation noted. Departures from full BMP implementation occurred on road storage projects and recreation projects. The sites where departures are noted identify emphasis areas where implementation, interpretation of the BMPs as well as communication and consistency in application needs to be emphasized. The departures were noted primarily related to culvert function/ stream diversion, culvert removal, and stream course protection plans. Details about the observations are included in the individual trip reports.



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**Picture 6.** Winstanley Island Dispersed Recreation Site

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## Evaluation of Results

The summary below includes short description and overview of Best Management Practice Implementation by resource topic. The interdisciplinary trips are summarized in detail in trip reports. Key observations documented by the monitoring groups on units and roads constructed include:

### **Riparian Standards and Guidelines & Stream Protection**

The riparian standards and guidelines implemented in most of the timber sales included the riparian standards and guidelines of the 2008 Forest Plan Record of Decision (ROD). The harvest units showed the Class I, II stream buffers as well as class III streams that are tributaries to class I and II streams. The Slake timber sale monitored included units that were harvested adjacent to class I and class II streams. Many of the Class III streams were direct tributaries to class I streams and showed slope break buffers.

The Forest Plan Standards and Guidelines describe management direction for various stream process

groups relative to application of the standards and guidelines to meet the objectives of the process group during timber harvest. Generally, no timber harvest is allowed within 100 horizontal feet of a Class I stream or Class II stream that flows into a Class I stream with a few exceptions for Class II streams that flow to the ocean or to Class III streams to flowing to Class I streams. The Forest Plan requires an additional area of reasonable assurance of wind firm outside the buffer widths. The riparian Standards and Guidelines reference the descriptions under the process groups for the specific guidelines. Slope break buffers on the Class III streams are required with reasonable assurance of wind firm areas (RAWs) in some situations. The required width of the RAW varies for process group. (For instance, the moderate gradient/ mixed control channels have a 120 feet or riparian area + reasonable assurance of wind firm area requirement).

The stream buffers were prescribed and implemented in the harvest units on the Slake Timber Sale. No problems were identified in the units relative to buffer layout and implementation. Slake unit 67B was bordered by two class I stream systems and showed three class I streams buffered from the unit. The stream system in this unit was complex with a number of class II, III and IV streams that were tributaries to the class I stream. The class I streams were prescribed 120 feet buffers plus RAW buffers of 40-60 feet. The class II streams showed prescribed and implemented 100 feet + RAW buffers. Unit 73D was split into four segments. This unit showed prescribed and implemented class I and II stream buffers in accordance with the Tongass Timber reform Act (TTRA) 100 feet minimum buffers on the fish streams, and process group buffers of 120 feet on the class I and II streams with RAW zones of 60-80 feet.

Class III and IV protections measures were implemented in the Slake Timber Sale units monitored. Unit 67B showed class III stream in the northwestern portion of the unit as well as several class IV streams that were tributaries to class I and II streams in the lower portions of the unit. There was a significant amount of wind throw timber in the class III stream buffers in Slake Timber Sale units 69 and 73D. Unit 69 was split into three segments to accommodate the buffers as well as settings. The timber protection class B was designated on the class III streams that were protected by slope break buffers as well as reasonable assurance of wind firm (RAW) buffers in unit 69. Unit 73D showed prescribed and implemented class III stream buffers. The class III streams were buffered within the unit and the group noted that roughly 80 percent of the class III buffer had blown down. Examining Boundary Timber Sale unit 5, the unit had a class III stream that was buffered from the unit. Portion of this unit was deleted so the stream was buffered by more than 100 feet from the harvest in the unit. In summary, there were a significant number of streams show in these units and the streams were buffered as prescribed through side slope buffers on class III streams within the unit.

### **Stream Identification/ Classification**

In some units, the stream classification completed in the NEPA process was not accurate relative to the class III and IV streams. The stream identification and verification completed during layout in some cases refined the initial stream work. However, in some cases, further stream identification and verification was completed during contract sale administration. Continued focus on BMP 12.6/ 12.6a and 13.16 relative to identification and verification of the streams is needed during the NEPA and layout processes.

The stream identification and mapping corrections that occurred during unit harvest in FY 2012 were all related to class IV streams. A number of corrections on stream mapping occurred on unit 73D of the Slake Timber Sale on class IV streams; however, these were corrected during layout. Unit 67B was monitored by the IDT and the stream identifications and classifications were implemented. The stream identification issues and implementation of protection is typically resolved through the sale administrators working with the fish biologists and hydrologists. The group noted conservative stream classification on the streams in these units. The fish biologist explained that this was due to the proximity of the streams to Logjam Creek. The subjective criterion was used to classify some small drainages class IV streams. There was an improvement of stream identification noted compared to some of the timber sales reviewed

in the past few years. We examined the transition zones on the streams in the units on the Slake Timber sale. The transition zones were consistent with the guidelines.

Reviewing the Boundary Timber sale, streams were noted as intermitted drainages and not designated on the sale area map. The streams flowed to a wet area below the unit and did not show any sediment transport.

The GIS locations of the streams and stream classifications need to be updated to include streams identified during layout and administration that were not input into the GIS streams cover. The cover needs to be updated both with the streams identified during planning as well as those identified and located during layout and administration. Follow up on this work typically scheduled during reconnaissance or layout is necessary.

On the road storage contracts, the streams were identified and classification documented in the project work lists. The classification of the streams was consistent with the guidelines in the 2008 Amended Forest Plan.

#### **Class IV Stream Protection**

The monitoring groups noted the Class IV streams were bridged or logs fully suspended over the streams during harvest. Tree debris was cleaned from the Class IV stream following harvest. The sale administrators followed up to ensure the operator removed the tree debris as necessary. Corrective actions were noted on the Slake Timber sale relative to changes in the stream designation and mapping as well as stream cleanout. The sale administrator worked with forest specialists to correctly map a number of streams. BMP monitoring was completed on the Slake units and the group found the stream protection measures were implemented. There was a minor amount of erosion noted on short stream sections in a couple of the class IV streams in unit 67B. This disturbance was limited to a short reaches in a couple streams and no sediment transport was noted. In a couple other situations on the Slake Timber Sale, the streams were identified during layout as documented in the Change Analysis. Overall the class IV stream protection was implemented.

#### **Wetlands**

Little soil disturbance was noted in the units harvested during the BMP review. During the BMP monitoring efforts to avoid wetlands and minimize impact were noted on the Slake Timber Sale. The operators utilized additional puncheon in wetland areas and avoided wetland areas as much as possible. There was a small inclusion of forested wetland in unit 67B. The operator used slash to minimize the damage to wetlands.

#### **Soil Stability/ Mass Movement**

Some shovel yarding was completed on slopes 25% - 40% slope gradient on the Slake Timber sale. Several acres were deleted from units on the Slake Timber sale due to soil instability. Particularly, slope stability problems were identified in unit 69 and 73D and portions of the unit were deleted to avoid these areas. As a mitigation measure, the unit was split into several parts and the areas of high mass movement index were dropped. In unit 69, the operator moved the shovel yarder vertically on the slope in one steep section of the unit and created some short ruts and disturbance. Minimal soil displacement was noted on the steep slopes and the soil was fluffed to minimize soil erosion. Tree debris was used to cover barred soil to minimize impacts from soil displacement. Site specific review needs to occur on these units before shovel yarding is implemented on slopes over twenty five percent slope gradient. A section of Boundary II unit 5 was deleted due to slope stability problems. No slope stability issues were noted in the portion of the unit harvested.

#### **Soil Erosion/ Soil Disturbance- Units**

Shovel Yarding: Minimal soil disturbance was noted in these areas; in relatively dry areas little evidence of shovel tracks was shown within the units in most areas. A few shovel tracks were noted on the Slake

Timber sale units, where the slopes exceeded 25% slope gradient. These tracks extended for less than 30 feet in isolated areas. No significant erosion, water rilling nor soil transport was noted in these equipment tracks. In Slake unit 67B, minimal soil disturbance was noted in the shovel yarded portions of the unit in the class IV stream reaches. The class IV streams were protected and tree debris from logging was removed.

On the shovel yarded units, the sale administrators worked with the operators to fluff the soils in these areas. Adequate soil depth was shown on the slopes and minimal displacement from the shovel yarder.

Cable Yarding: Minor soil disturbance was noted in the units monitored. The yarding systems and landing locations were modified to provide at least partial suspension. There were a few cases on the Slake unit 69, 67B, and 73D where some soil scuffs were noted. On the units with timber harvested by cable yarding systems, the timber was yarded to the road so potential disturbance to the soil associated with the landings was minimized. Some isolated portions of the units where there were wetlands were deleted during sale administration. In Boundary II unit 5, some soil disturbance was noted associated with blind lead below the yarder. A ploughed soil area roughly six feet by 40 feet was noted. This soil disturbance is roughly 0.01percent and lower than the three percent anticipated and fifteen percent allowable soil disturbance defined in the soil quality standards.

Minor soil and bank erosion was shown in unit 67B in the cable corridor; however, no impact to soil and water resources was noted. In unit 67B there was a minor amount of soil disturbance where deflection did not provide for partial suspension. The disturbed area was minor and suspension was achieved in 98 percent of the unit. In unit 69, minor soil disturbance was noted in a few yarding corridors where partial suspension was not achieved. There was one disturbed area roughly 40 feet by three feet noted. The soil was not transported from the localized area. There were a few short ruts where minor water rilling and sheet erosion was noted; however, the rills were isolated and did not transport water to the streams.

### **Soil Erosion- Drainage**

The roads stored showed adequate seeding application in most cases and poor germination in others. Seeding was required in the road storage contracts on disturbed soil. The group recommended modifications to the contract language to require seeding immediately after the soil disturbance occurs. The erosion potential and quantity of fine sediment vulnerable to surface erosion was variable along these roads. Additional cross drains and excavation of the cross drains to the natural ground elevation are needed to effectively transport water across the road. The road monitored on Kuiu showed a significant amount of fill retained in the crossing where the crossing was not excavated to natural grade. Potential diversion of water was noted on the Petersburg roads as well as Shoal Cove roads. On the Petersburg roads, water was noted running across the road surface on the Mitkof 6200, 6226, 6280, and 40007 roads. Mitkof roads 6200 and 6280 were closed but not stored. Road 40007 was open and drivable but needed storm proofing to prevent diversion of class IV streams. On Shoal Cove road 8435000, water was ponded along the road where storm proofing was needed. Shoal Cove road 8400000 showed one culvert adjacent to a wet area created at a beaver pond was blocked. The need for continued maintenance on the stored and closed roads, particularly the roads where culverts were retained, is necessary.

### **Culvert/ Bridge Installation, Design & Removal**

The culverts and bridges were installed per design and contract changes. State of Alaska concurrence for the timing of the installations/ removals on fish streams and removal of culverts and bridges was requested and implemented. No turbidity measurements were taken at the stream crossings so no data relative to compliance with State Water Quality Standards was available.

Bridge reconstruction and removal monitored this year included only five sites and showed full bmp implementation. The reconstructed road monitored was on the Slake Timber sale, road 3030720. Two bridges were shown replaced on this road. These bridges were replaced during the timing windows and the stipulations described in the Title 16 concurrence documents were implemented. Bridge removals

were monitored on Kruzof Island, Whale Tail Road on Zarembo Island as well as on Shoal Cove road 8430200. The bridge removals were completed with no impact to the streams and the channels were flowing in unrestricted streams. The slopes on the Eagle Creek and Whale Tail projects were laid back to stable gradients and the slopes on the Shoal Cove crossing matched the natural channel banks. These bridge removals were completed during fish timing in compliance with the Title 16 Concurrence from the State of Alaska.

Generally, the road storage projects showed successful removal of a number of culverts. There were a few culverts that were removed that showed over-steep slopes on the excavated fill particularly on the Prince of Wales and Shoal Cove road storage projects. Minor concern was mentioned with the slopes raveling and slumping into the streams. In most cases, the natural drainage patterns were restored when the structures were removed. The original drainage patterns are difficult to discern in alluvial fan areas as well as low gradient areas where the streams meander adjacent to the roads. In a few cases where culverts were not removed, maintenance or removal is needed.

On some of the older roads that were stored with the culverts retained, some road and culvert maintenance. This was evidenced on Mitkof road 6226 that was an OHV trail and stored in 2007. Water was running on the road and additional water bars are needed. On Mitkof roads 40007, 6280 and 6200, the culverts needed to be assessed and cleaned or removed and additional water bars excavated to prevent streams from diverting onto the road. These roads are scheduled to be closed but currently were stored with vegetative closure following earlier protocol. Water had topped the culvert and run on the road on Shoal Cove road 8400000, at one site adjacent to a beaver pond. The culvert was cleaned of debris during the monitoring trip and will be maintained on a regular basis until the road is closed and the culvert removed.

On a few of the Shoal Cove roads and Prince of Wales roads, the cut slopes on culvert removal sites were steep and showed potential to ravel, although only minimal raveling in isolated parts of the slope had occurred. A couple of the crossings on the 8435000 road showed over steepened slopes, although the fill material had stabilized. On Prince of Wales road 2000454, there were a few over steep slopes shown on the excavations. The channels were excavated wider than the stream channel so minor slough of fill should not impact flow. On some of the roads, particularly in the Shoal Cove area, the channel banks were stabilized with rock. At the class II stream crossing on road 8435000 in the Shoal Cove area, the channel was stabilized with rock that armored the upper channel bank and prevented erosion. Slopes on the excavations at the class III stream crossings on this road were stable and did not require armoring. The channel banks of only channels that showed potential to cut into the fill or head cut were stabilized with armor rock.

Considering the roads monitored, in most cases 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. The contracts also included laying the slopes back on pulled culverts to a 3:1 gradient to provide crossings that could be driven over by ATV vehicles. The excavated rock was placed roughly ten feet from the slope of the water crossings to prevent ravel into the stream crossings. The stream crossings showed relatively stable slopes. The cross drains excavated serve to provide water transport and maintain natural drainage patterns.

The dips, ditches, and cross drains installed served to provide water transport and maintain natural drainage patterns. Cross drains and dips were excavated in the running surface on the initial section of the 8030200 road in the Shoal Cove area. On the Shoal Cove roads, there was some rip-rap shown in the base of the crossings to minimize erosion. There were catch basins constructed as well as ditch dams to maintain the water flow in the ditches on the roads monitored on Prince of Wales. Dips in the road prism

were constructed to provide for water transport in short term storage, for storm proofing and to minimize maintenance.

Monitoring included verification of the process followed to implement changes that occurred during the road storage contract administration. Changes in the field need on class I and II stream culverts need to be reviewed by the hydrologists or fish biologists. The group noted that these discussions had occurred this fiscal year and concurrence with the District Rangers on specific ATM implementation had occurred. On the 3000382 road on Prince of Wales, a culvert was left in a class II stream that had been designated for removal and the contract was still in operation. Work on this road was completed in accordance with the management direction; the culvert was removed shortly after the monitoring trip.

Providing cross drainage for live streams, as well as, water running in the ditches is necessary. In most cases, the removed culvert stream crossings and cross drains were excavated to the natural ground to connect the drainages across the road prism. The road bed was not excavated to natural gradients on the cross drain on the temporary road on the Boundary timber project. The operator excavated the cross drains with a shovel. The timber sale administrators have committed to make sure the operators have the equipment on site that can construct the cross drains as shown on the construction typical drawings. The cross drain was to be reconstructed following additional work on the road on private land.

In summary, hundreds of miles of road involved in the storage and decommissioning demonstrate very minimal diversion on the running surface of the road and minimal erosion. A couple of the sites showed potential for water diversion where the ditches were not deep enough or filled in with sediment so the transport to the culverts were not functioning to transport water across the road. These sites were on roads that were not closed yet or stored under protocols used 5-10 years ago. Additional cross drainage structures need to be added or water bars to transport the water off the running surface.

### **Oil Pollution Control Measures**

A spill countermeasure control plan was implemented during timber harvest and road construction/reconstruction. No incidents of oil leaks were observed and/ or reported.

### **Recommendations- General Notes**

Reviewing the units and road sites reviewed by the IDT, the findings show that in most cases the BMPs are being implemented and effective in providing protection to streams and soil resources. The National pilot BMP forms were utilized and proved useful. Continued communication and training will be emphasized with the engineers and personnel on the BMP monitoring trips to ensure they consistently apply the monitoring system and BMPs.

Overall the monitoring indicates that the Best Management Practices are being implemented. The monitoring system is conveying useful implementation information through the form notations and descriptions. The IDT monitoring was only documented on the BMP implementation and effectiveness forms. The 100 % monitoring was documented through timber sale, road construction and road closure contract inspection. The cover sheet for each unit and road was completed to provide a mechanism to track the length of stream classes, acres, and miles of road monitored. A list of the specific BMPs was added to the cover sheet so tracking of streams numbers and contracts could be tracked. The combination of the coversheet, cross walks and draft national BMP forms facilitated discussion and focus of the monitoring effort.

Consistency with the Alaska Forest Resources and Practices Regulations should be emphasized. The Alaska Region BMP handbook is outdated and inconsistent with the road terminology associated with road maintenance and practices of linear graded road specifications. Upon completion of a National Forest Service BMP handbook, revisions to the Regional BMPs will be considered.

Recommendations follow that soils, invasive plants, and hydrology specialists continue to review erosion control and evaluate effectiveness of the guidance. The resource specialists need to work with the

engineers specifically on ensuring the stream classification information is described on the road cards and plans. Additional work needs to occur to better define the design criteria for the excavated banks adjacent to streams where bridge sills and culverts are removed. Typical designs should address the stream course and stream banks in the cross section drawings. Additional focus needs to be provided on seeding, and implementation of culvert removal and cross drains.

## Citations

- USFS 2012. National Best Management Practices for Water Quality Management on National Forest System Lands, Volume 1: National Core BMP Technical Guide. Available at [http://www.fs.fed.us/biology/resources/pubs/watershed/FS\\_National\\_Core\\_BMPs\\_April2012.pdf](http://www.fs.fed.us/biology/resources/pubs/watershed/FS_National_Core_BMPs_April2012.pdf)
- USFS 2006. Alaska Region BMPs (FSH 2509.22 – Soil and Water Conservation Handbook, R-10 Amendment)