

Wetlands

Goal: Minimize the destruction, loss, or degradation of wetlands and preserve and enhance wetland functions and values.

Objectives: Avoid alteration of or new construction in wetlands whenever there is a practicable environmentally preferred alternative. Implement Best Management Practices (BMPs) and Estuary, Riparian, and Soil and Water Standards and Guidelines specific to wetlands.

Background: Wetland implementation monitoring will follow established protocols for 100 percent BMP implementation monitoring. Additionally, a representative sample of harvest units and associated roads will be monitored annually using an interdisciplinary approach. Avoidance of wetlands will be monitored Tongass-wide each year, through GIS and field reconnaissance analyses.

Currently, the Tongass National Forest does not have an approved method to evaluate the long term effectiveness of BMPs related to impacts of management activities on wetland functions and values. Each environmental impact statement (EIS) completed for projects that contain wetlands includes evaluation and finding for impacts relative to wetlands. BMPs are effective in minimizing effects on wetlands; however, long-term effects on disturbed wetland values and functions are less known. Studies exist that partially answer functional effectiveness questions. Some of these studies are complete and some are ongoing. No one study gives the answer to all the functional questions associated with management activities in wetlands.

Wetland implementation monitoring will follow established protocols for 100 percent BMP implementation monitoring. For FY 2006, wetland monitoring protocols were revised. Standard forms have been created to qualitatively rank the implementation and effectiveness of the 15 Federal Baseline Provisions documented in 33 CFR 323.4 and BMP 12.5. The standard forms will be completed by a team of wetland scientists on a randomly selected group of newly constructed road segments in wetlands.

The revised wetland monitoring protocol (Landwehr, 2006) also provides a procedure for documenting wetland avoidance in project-level NEPA documents. The protocol uses measurements to document the physical impacts to wetland soils as a result of road construction. The wetland monitoring report for FY 2006 is currently in draft form.

Wetland Question 1: Are Wetlands Standards and Guidelines being implemented?

Implementation Monitoring

The information provided in Table Wet-1 was from project implementation of Category 3 and 4¹ timber sales, those timber sale projects for which the project-level NEPA was done after the 1997 Tongass Land and Resource Management Plan Record of Decision (Forest Plan ROD), or for projects which were completed prior to the 1997 ROD had subsequent revisions

¹ Category 1 and 2 timber sales were sales that were just or nearly completed when the Forest Plan ROD was signed and so did not include all of the Forest Plan Standards and Guidelines. Category 3 and 4 timber sales had environmental documents not as complete and were required to incorporate the Forest Plan Standards and Guidelines.

to the project standards and guidelines to reflect the Forest Plan standards for wetlands. The activities that took place in 2006 were developed to achieve consistency with the revised Forest Plan.

Road construction through wetlands occurred on three project Areas in FY 2006. The project areas are South Lindenburg on the Petersburg Ranger District, The Skipping Cow Timber Sale on the Wrangell Ranger District and the Licking Creek Timber Sale on the Ketchikan-Misty Ranger District. Table Wet-1 summarizes the acres of wetland affected by road construction.

Table Wet-1. Total Acres of Wetlands Harvested and Miles of Road Constructed for the Tongass National Forest Managed in FY 2006

Total Wetland Acres¹	Wetland Acres Harvested	% Total	Wetland Acres² Affected by Road Construction	% Total
5,709,069	2199	<0.1%	26	0.1%

¹ Total acres of mapped land (excluding private lands and some wilderness areas); data was from Tongass Soils GIS layer (CLU, or Common Land Unit), managed stands, and roads database.

² Based on an average of a 40-foot wide road

Monitoring Results

Total wetlands affected by timber harvest units were 2199 acres (excluding some wilderness and private lands). This accounts for less than 0.1 percent of the total wetlands. Forested wetland and palustrine emergent wetland complexes were most affected by timber harvest. Of the total acres harvested in FY2006 (3379 acres see note 1 on table Wet-1), wetlands comprised approximately 65% of those acres using the 2006 updated data attributes and soil classifications to delineate wetlands. Prescriptions are developed and implemented to minimize impact to wetlands. Timber harvest and related road development are not restricted activities on forested wetlands under the Clean Water Act.

The roads on the Skipping Cow Project Area were chosen for a more intensive look at the implementation of baseline provisions. For FY 2006 four newly constructed road segments on the Skipping Cow Timber Sale Project were measured. The four road segments totaled 6,459 feet in length. Qualitative assessments of the implementation and effectiveness of the baseline provisions were completed by a team of four soil scientists and one ecologist. The team found that documentation of wetland avoidance on the Skipping Cow road cards was generally good. The complete report (Landwehr 2007) is currently in draft form. The findings are briefly summarized here. Wetland avoidance is best captured at the project-level scale. Miles of road through wetlands predicted in the Skipping Cow FEIS were fairly accurate.

The team found that implementation of the baseline provisions to minimize impacts to wetlands was also relatively good, but that there is room for improvement or at least additional study in five areas. 1) Two of the skipping Cow roads were pioneered when up to two feet of snow covered the wetlands. The pioneer shovel operator lost track of the clearing limit flags in one instance and operated outside the clearing limits for approximately 150 feet. Pioneering with snow on the ground also resulted in fill placement outside the final road prism, and unnecessary drainage of two small muskeg ponds. 2) Additional cross drains may improve flow and circulation of water in the wetland, currently water at four sites drains unimpeded through coarse rock fill. The roads will be put in storage following timber harvest

and these sites would be good candidates for cross drains ditches through the road fill. 3) The development of two rock pits in wetlands resulted in overshots, which caused more wetland to be buried by shot rock than necessary. 4) Grubbing on all four road segments seemed excessive. Disturbed soil widths averaged 45.5 feet. The soils in the wetlands were typically less than 20 inches thick slopes ranged up to 43 percent gradient. Pioneer road construction involved stripping as much soil as possible from the hillslope to create a level road subgrade. Due to the thin soils the operator reached as far from the road alignment as possible to collect enough soil material to construct a level road subgrade. Rock overlay would have resulted in approximately a 45% reduction in wetland acres impacted, but would used more rock, resulting in higher road costs and bigger rock pits, some of which were located in wetlands. 5) Turnouts on road segment 52033 #2 were larger than typically seen on forest roads. The road construction contract for the Skipping Cow roads does not specify a maximum turnout size, but some of the turnouts measured were nearly double the minimum turnout size. Smaller turnouts would have impacted less wetland area.

The also measured the physical area of wetland impacted from the four road segments. The report (Landwehr 2007) documents the results of literature review that estimated the hydrologic effects of the road segments on the wetland beyond the disturbed soil corridor associated with the road. The Skipping Cow FEIS estimated a disturbed soil corridor 24 feet wide through wetland areas. The actual disturbed soil corridor measured along four road segments in wetlands was 45.5 feet wide. Other NEPA documents on the forest estimate a 40 foot wide disturbed soil corridor for roads through wetlands and that estimate seem more appropriate for future documents.

Best Management Practices (BMPs) Implementation Monitoring

BMP implementation monitoring for wetlands (BMP 12.5) follows direction in the Tongass National Forest Best Management Practices Implementation Monitoring Strategy (June 1998) protocols. Results from that monitoring are reported in the annual BMP Implementation Monitoring Report, Appendix. Refer to the 2006 BMP Monitoring Report for details on how the monitoring was conducted. A summary of the findings for soil and water resources is given below in Tables Wet-2.

The Wetland Standards and Guidelines were monitored on the Tongass through guidelines described in the Tongass Monitoring Strategy. The strategy was developed to provide direction for Tongass Land and Resource Management Plan implementation monitoring. The BMPs evaluated are included in the Soil and Water Conservation Handbook (FSH 2509.22, October 1996).

BMP Monitoring Results

A total of 31 timber harvest units and 25 roads/road segments (includes 8 culvert replacement sites) were monitored this year through the 100 percent implementation monitoring process. A subset of the total BMP implementation monitoring pool, consisting of four units and six road construction segments including four fish pass improvement culvert replacements (located on one road) was monitored during the interdisciplinary team (IDT) monitoring process. The tables discussed below reflect results from the total units and roads monitored in the 100 percent and IDT monitoring efforts. Table Wet-2 shows the number of times the BMPs specific to wetlands were monitored and implemented. The Best Management Practice relative to wetlands is BMP 12.5 – Wetland Protection Measures.

The BMP for Wetland Protection Measures was monitored on the 957.39 acres monitored and documented through the 100 percent implementation monitoring effort and the 133.91 in the IDT quality control monitoring. On the monitoring forms, 48.86 acres of wetlands were noted in the 100 percent monitoring effort from documentation in the planning unit and road cards and 16.86 acres were noted in the IDT reviews.

Table Wet-2. Summary of BMP Use, Number of Departures and Corrective Actions for 100% & IDT Monitoring in FY 2006

BMPs Applied	Number of Times the BMP was Appropriate for Use	Number of Departures from Full BMP Implementation	Number of Times Corrective Action Applied
12.5 Wetland Protection Measures	26	0	0

The tables reflect results from the total units and roads monitored in the 100 percent and 10 percent IDT monitoring efforts. Results of the 100-percent monitoring of units and roads for BMP 12.5 in FY 2006 concluded that the BMP was implemented.

Wetlands were identified in a few of the units, isolated wetland areas were deleted or boundaries changed to avoid impact to muskeg and fen areas. At the culvert reconstruction sites in wetland areas, efforts were noted minimize impact to the wetlands water levels. In units where forested wetland was harvested, partial to full suspension measures were prescribed and implemented. Specific yarding systems were designed and used under the close supervision of the sale administrator in wetland areas. Very little soil disturbance was noted in the harvested wetland areas monitored. No departures were noted relative to wetlands delineation and protection.

Evaluation of Results

The BMPs are being implemented on the Tongass National Forest. The high quality work of the individuals involved with the site investigations, layout, unit design, environmental assessment, and contract administration has contributed to this success. Training on wetland identification and protection conducted on the Tongass and communication about wetland protection has increased the knowledge of sale administrators and engineers. The sale administrators actively avoided wetlands and implemented protective prescriptions on wetlands. They deleted wetland areas to protect wetlands. The logging systems were specifically designed with prescriptions for wetlands. Continued emphasis needs to be placed on identifying these wetland areas during environmental assessment and layout. In several of the older environmental assessment documents, the wetland areas were not identified on the unit and road cards or specified by unit in the documents. Particular focus on identification of wetlands and avoidance needs to be conveyed to contractors preparing EIS and EA documents. Increased inspection of this work at the planning and layout phases is necessary.

With less than 0.1 percent of the total wetlands affected by road construction and timber harvest, the Tongass National Forest has fulfilled the intent of implementation of Wetland

Standards and Guidelines in avoiding wetlands where practicable. Even with the combined effects of 1998 to 2006 activities on wetlands, the Forest is illustrating avoidance of wetlands in its management activities. Overall, BMPs are being implemented where applicable, according to the 100 percent sampling results, by sale administrators and engineering representatives and the spot sampling conducted by the Tongass BMP oversight team. This has been the case for the last seven years of monitoring. Trends indicate that BMPs are being prescribed site specifically and are being fully implemented.

The road contract specification and contract administration resulted in a high rate of BMP awareness and implementation. The 15 federal baseline provisions emphasize wetland avoidance and minimizing impacts to wetlands. Better techniques for displaying wetland avoidance have been identified and will be incorporated in future NEPA documents. Executive Order 11990 and subsequent regulations require that impacts to wetlands be minimized to the extent practicable. Evaluation of the Forest's implementation of the baseline provisions boils down to the definition of practicable. Is it practicable to use rock overlay road construction techniques in sloping wetlands versus cut-and-fill construction techniques when rock overlay costs more but results in 45% less wetland area impacted? Continued monitoring of the implementation of the 15 baseline provisions and analysis of the area of wetland impacted under different road construction scenarios will help answer the cost-benefit question.

Action Plans

As described in the action plans associated with Soil and Water Question 3, recommendations follow to involve district specialists throughout the environmental assessment, layout and implementation of the BMPs. Most of the corrections and unit deletions to exclude wetlands from units occurred on environmental documents developed and laid out by contractors. More oversight and careful inspection of the contacted work is required to ensure the units do not include large inclusions of wetlands. Native riparian vegetation should be replaced if the vegetation is excavated during construction.

The wetland monitoring report recommends continuing with the implementation monitoring protocols used in FY 2006. Future NEPA documents that include activities on wetlands will include a section that describes wetland avoidance at the project scale. An example is included in the Scratchings Timber Sale Final Environmental Impact Statement.

Wetland Question 2: Are Wetland standards and guidelines effective in minimizing the impacts to wetlands and their associated functions and values?

During FY 2006, the Forest ecology group continued the wetland classification project. Most of the work accomplished was entering all field data into the NRIS Terra database and initial analysis of the vegetation types using PC-ORD. A few additional sampling sites were completed. The wetland classification was identified in fiscal year 2000 to be a critical component to developing effectiveness-monitoring protocols. The wetland classification is also part of a larger classification effort initiated under the Existing Vegetation module of the Natural Resource Information System (NRIS).

No field plot data was collected in FY 2006 due to limited funding. Overall 520 plots have been inventoried through 2004. Data analysis has identified 20 preliminary plant associations. The data is skewed toward a few ecological subsections, so the 20 preliminary plant associations are subject to change when more plots are completed and analyzed.

The revised wetland monitoring protocol (Landwehr 2006) involved data collection that quantified the physical impacts to wetland soils. The protocol also required collecting soil data and landscape position data. To document hydrologic effects of the road on the wetlands the protocol required a literature review of research completed in similar landscape positions and soils. For the soils and landscape positions encountered on the Skipping Cow Road segments the literature review included Tongass specific research and research from northern England. The physical impacts to wetland soils occurred in a disturbed soil corridor that averaged 45.5 feet in width. Within the disturbed soil corridor shot rock road fill and exposed bedrock cut-banks would replace the shallow wetlands soils. Within the disturbed soil corridor the wetland has been converted to upland. The literature review indicated that hydrologic impacts to wetlands soils would likely extend approximately 3 meters (10 feet) beyond the disturbed soil corridor. The hydrologic effects in wetlands beyond the disturbed soil corridor would be a change in surface runoff characteristics and a minor change in soil water tables. The area beyond the disturbed soil corridor would remain wetland, but subtle changes in vegetation composition may be evident after a period of several years, see Landwehr, 2007 for more discussion. The findings presented in the report are specific to the wetlands encountered on the Skipping Cow Roads and roads across lower elevation wetlands may have different impacts.

Action Plans

The wetland monitoring report (Landwehr, 2007) recommends continued wetland implementation monitoring and quantification of the impacts of roads through wetlands. The report also recommends expanding the wetland monitoring to include a study of wetland vegetation changes adjacent to roads that are more than 30 years old.