



United States
Department of
Agriculture

Forest Service

Tongass National
Forest

R10-MB-609
September 2007



Tongass National Forest, 2006 Annual Monitoring & Evaluation Report Executive Summary



Lichen epiphyte sleeves, photo by Karen Dillman

Table of Contents

2006 ANNUAL MONITORING & EVALUATION REPORT 1

Table of Contents	3	
Welcome and Introduction	4	
Summary of the Monitoring and Evaluation Report, 2006		4
Air Quality	4	
Biodiversity	5	
Fish Habitat	6	
Heritage Resources.....	8	
Karst and Cave	9	
Land Management Planning.....	10	
Local and Regional Economics.....	10	
Minerals and Geology	11	
Recreation and Tourism	11	
Research	12	
Scenery	12	
Soil and Water.....	12	
Timber Management	14	
Timber Management	15	
Transportation	16	
Wetlands.....	16	
Wild and Scenic River.....	17	
Wilderness Area	17	
Wildlife.....	18	
Costs and Outputs Question	19	

Welcome and Introduction

Welcome to the 2006 Tongass National Forest Monitoring Report. This Executive Summary contains highlights of Forest programs in Fiscal Year 2006 and summaries of the monitoring questions and answers. It is hoped that this web-based access to the annual monitoring report, will provide accessible, user-friendly avenues to learn more about the monitoring process and how it meshes with products and processes outlined in the 1997 Tongass National Forest Resource and Land Management Plan as amended (Forest Plan).

As required in the Code of Federal Regulations (CFR), under 36 CFR 219, the Tongass National Forest (Tongass) issues an annual monitoring report. Tongass resource specialists gather the results of monitoring efforts throughout the forest into a monitoring report. Monitoring and evaluation is a quality control process for implementation of the Forest Plan.

The Forest Plan identifies management direction for the Tongass in terms of goals, objectives, and Standards and Guidelines - all of which are based on underlying assumptions (policy, theory, data, and technology). Monitoring is gathering data and information and observing the results of management activities to provide a basis for the periodic evaluation of the Forest Plan. Evaluation is a process for interpreting monitoring data and determining whether changes in management direction are needed. The Forest Plan recognizes three types of monitoring and evaluation: implementation, effectiveness, and validation.

Summary of the Monitoring and Evaluation Report, 2006

Air Quality Question 1: Is air quality meeting state and federal ambient air quality standards?

During 2006, Alaska Department of Environmental Compliance (ADEC) and the Environmental Protection Agency (EPA) monitored particulate matter (PM10 and PM2.5) in the air from Juneau's Mendenhall Valley for 89 days. 80 days had good air quality while 9 days were moderate air quality.

Air quality was monitored by various methods on the Tongass National Forest in 2006. The IMPROVE data for 2006 from Petersburg are not available on the web as the analysis is one year behind at the University of California-Davis Crocker Laboratory. Two letters of warning were issued by ADEC to cruise ships that enter into Tracy Arm from the USFS wilderness ranger's opacity readings of smoke stack emissions. Lichen biomonitoring plots were not established in 2006. Results for the lichen biomonitoring program are being prepared for 2007. To date, the National Park Service has not completed the WACAP results.

No corrective action with respect to air quality on the Tongass National Forest is recommended at this time. Monitoring should continue to be summarized on an annual basis from urban areas in close proximity to Forest lands, such as the Juneau area. In order to establish trends in pollution levels, the biomonitoring with lichens should continue to be done on a five to ten year interval. USFS wilderness rangers will continue to work with ADEC to monitor cruise ship emissions in Tracy Arm. The USFS and the National Park Service in Glacier Bay and Skagway should collaborate on cruise ship pollution impacts to ecosystems on federal lands. Data from the IMPROVE site will be collected for three to five years to observe trends and determine regional and global significance. The WACAP results will indicate if and at what latitude and elevation are the POPS and SOCS are accumulating in Alaska and on the Tongass.

Biodiversity Question 1: Are contiguous blocks of old-growth habitat being maintained in a Forest-wide system of old-growth reserves to support viable and well-distributed populations of old-growth-associated species and subspecies?

As directed in the Forest Plan, small old-growth reserves (OGRs) are being systematically reviewed as part of individual timber sale plans. Since the signing of the Forest Plan Record of Decision (ROD) in May 1997, some project-level plans have changed the size or composition of old growth reserves. None of these changes significantly changed the spacing of the reserves. To date, four other environmental documents, Indian River Timber Sale(s), Skipping Cow Timber Sale, Crane and Rowan Mountain, and Emerald Bay, did not amend OGR boundaries. Since May 1997, project level decisions have generally increased the size and improved composition of Old-growth Reserves.

Biodiversity Question 2: Are the effects on biodiversity consistent with those estimated in the Forest Plan?

Biodiversity analyses within the Forest Plan assume the maximum level of harvest. The Forest Plan allows for an ASQ harvest of 267 million board feet of timber (MMBF). An ASQ of 267 MMBF equates to an annual harvest of about 8,529 acres of POG for the first decade of the Forest Plan. Less than half of the annual allowed harvest has occurred during the first 7 years of Forest Plan implementation (Tables B-5 and B-6). Therefore, the magnitude of timber harvest and the potential impacts on biodiversity have been less than those forecast in the Forest Plan. It appears that this trend will continue for the foreseeable future. In fiscal year 2005, only 24% of the ASQ was harvested. Even less was harvested in 2006.

Biodiversity Question 3: Are management practices consistent with current knowledge regarding sensitive species conservation?

These practices are consistent with “sensitive species” as defined as federally (U. S. Fish and Wildlife Service [USFWS] and National Marine Fisheries Service [NMFS]) listed threatened or endangered species, Alaska Region (Forest Service) sensitive species, and state (Alaska Department of Fish and Game [ADF&G]) species of concern.

Forest Service wildlife biologists and biological technicians completed 51 Biological Evaluations (BEs) during the 2006 fiscal year for R10 sensitive wildlife species. Most of the analyses reported a “no impact” determination, while a few reported a “may impact individuals but not likely to adversely affect population viability” for others.

Tongass National Forest botanists and ecologists completed BEs for sensitive plants for 64 projects on the Forest during FY2006. For 46 projects, the determination was “no impact” to sensitive plants. In the 18 of the BEs the “may impact individuals but not likely to result in a trend to federal listing or loss of viability” determination was made for one or more of the following sensitive plants: *Carex lenticularis* var. *dolia*, *Cirsium edule*, *Glyceria leptostachya*, *Hymenophyllum wrightii*, *Isoetes truncata*, *Ligusticum calderi*, *Papaver alboroseum*, *Platanthera gracilis*, *Poa laxiflora*, *Puccinellia kamtschatica*, *Romanzoffia unalaschcensis*, and *Senecio moresbiensis*. Four BEs reported a determination of “may have beneficial impacts” for *Glyceria leptostachya*.

Biodiversity Question 4: Are destructive insect and disease organisms increasing to potentially damaging levels following management activities?

The most important diseases and natural declines on the Tongass National Forest since approval of the Revised Forest Plan in 1997 as well as in 2006 were wood decay of live trees, hemlock dwarf mistletoe, and yellow-cedar decline. Heart and butt rot fungi cause substantial decay in late seral spruce-hemlock forests. No serious insect or disease organisms in young-growth stands were detected through monitoring efforts. Dwarf mistletoe is present in some stands following partial harvests, but at disease levels less than occurred before harvest.

Within their limited distribution in southeast Alaska, porcupines are the most damaging biological agent to the health and productivity of young growth trees. Ground and aerial observations of areas with intense feeding will be made in 2007 in order to help produce thinning guidelines in young-growth stands with porcupines.

Fish Habitat Question 1: Are population trends for Management Indicator Species (MIS) and their relationship to habitat changes consistent with expectations?

No consistent trends are evident in the abundance of the management indicator species since monitoring began in 1997. For some streams and for short intervals, Dolly Varden char and cutthroat trout appear to be increasing and for other streams the species appear to be decreasing. There are no obvious trends for many streams. The region-wide abundance of coho and pink salmon, as indicated by the annual commercial harvests and spawner escapements, is annually variable with no evident trends. Although the commercial harvest was low in 2006, abundance for both salmon species is at relatively high levels compared to historic data dating back to the late 1800's.

Monitoring protocols are being developed that are expected to be more sensitive to forest management than the methods prescribed in the Forest Plan. The Forest Plan generally requires annual monitoring of the Alaska Department of Fish and Game's (ADF&G's) harvest and escapement data. Since 1999, actual abundance of Dolly Varden and cutthroat in small streams has been estimated and stream habitat has been measured. For coho and pink salmon, we continue to review the commercial harvest and escapement data, but we are actively developing an alternate protocol to monitor juvenile coho salmon in streams. The protocol will be completed in FY07. For pink salmon, a project to determine the sensitivity of historical escapement data to past timber harvest has terminated as the escapement data is not appropriate for this use.

It is recommended that the Forest Plan be modified for Dolly Varden and cutthroat MIS monitoring to specify annual population estimates and stream habitat measurements.

Fish Habitat Question 2: Are Fish Riparian Standards and Guidelines being implemented?

Fish Riparian Standards and Guidelines are being implemented based on two types of assessments for Best Management Practices (BMPs): 100 percent monitoring of units closed out and roads complete and Interdisciplinary Team (IDT) quality control monitoring. This monitoring covered about 957.39 acres in 31 harvest units and 25 road segments including 8 culvert replacement sites.

Best Management Practices are successfully being implemented on the Tongass. Significant lengths of stream channels were reported as protected during unit harvest in the implementation monitoring effort in FY 2006. During this monitoring Best Management Practices relative to

fisheries habitat showed one corrective action and no departures from full BMP implementation. In one unit a discrepancy was shown between the sale area map and flagging on the ground on stream. The sale area map showed the stream as a class III stream and one stream reach was designated as class II. The stream was reviewed by a fisheries biologist and the class III stream prescription was implemented. A few other changes were made relative to fish and riparian management practices. These changes included dropping acreage from a unit that had an extensive braided stream channels to provide stream protection. A few trees were cut from a class II buffer due to safety concerns associated with yarding; however, no impact was noted to the stream channel. Recommendations include modification of the monitoring process to transition to monitor a smaller subset of units and roads since implementation is being completed successfully.

Fish Habitat Question 3: Are Fish and Riparian Standards and Guidelines effective in maintaining or improving fish habitat?

Fish Passage

Upstream Passage of Juvenile Fish at Road Crossings

Fish Passage Standards and Guidelines including drainage structure design criteria have evolved over time and are still evolving as information on fish swimming performance, fish movement patterns and culvert hydraulics is improved. Therefore, the assessment of the effectiveness of the Standards and Guidelines contained in the Forest Plan can only be meaningfully conducted on drainage structures designed since the effective date of the Forest Plan (1997). Forest Plan Standards and Guidelines acknowledge the need to restore and improve the opportunities for fish passage through drainage structures regardless of when they were designed and installed.

During 2006, twenty-nine culverts that were installed since the inception of the current Forest Plan (1997) were evaluated for their ability to provide juvenile fish passage. Criteria defined in the Juvenile Fish Passage Evaluation Criteria Matrix were used to evaluate the culverts. The culverts evaluated were not randomly selected but were selected for the following reasons: 1) information on their passage status was required for other project objectives; or 2) they were considered to have a higher probability of not meeting passage standards; or 3) they were in the vicinity of the culverts considered to have a higher probability of not meeting passage standards.

The evaluated culverts were installed from 1999 to 2005 and are located on the Hoonah and Craig Ranger Districts. Twenty-five of the culverts are round corrugated metal pipes and four of them are corrugated metal arch pipes. The stream gradients in which the culverts were installed varied from 1 to 11 percent.

Twenty-five (86%) of the culverts evaluated had conditions that were considered adequate to meet juvenile fish passage standards (Green), while 2 (7%) of the culverts had conditions assumed not adequate to fully meet juvenile passage standards (Red) and 2 (7%) culverts require further more detailed analysis with the use of FishXing analytical software.

The two culverts classified as Red culverts were assumed not to meet juvenile fish passage standards because they were installed at too steep of a gradient without enough bedload material retained within them. One of them was installed at a gradient of 7.1% with no bedload retention while the other was installed at a gradient of 2.2% and although it had bedload throughout its length the depth of bedload was insufficient.

Only one of the assessed culverts had an outlet perch and all but two of the culverts were embedded and contained bedload substrate throughout their length.

It is important to emphasize that fish are assumed able to pass through most of the crossings identified in the Red and Gray categories most of the year. Results from a Tongass National Forest survey which evaluated habitat conditions and fish presence upstream of approximately 1,200 Red culverts indicated that 84% of these crossings do have fish located upstream of them. Through more intensive sampling, fish may eventually be found upstream of more of the crossings. Also, it is possible that some of the stream sections upstream of the identified Red and Gray crossings never supported fish and is not actually fish habitat.

Fish Habitat Objectives and Case Study Watersheds

The Forest Plan directs us to use fish habitat objectives to evaluate aquatic habitat health. As part of the Forest Plan aquatic monitoring synthesis, long term monitoring is underway in three case study watersheds. A goal of the Aquatic Synthesis is to evaluate watershed-scale influences on fish habitat, including the effectiveness of Forest Plan Standards and Guidelines at protecting fish habitat. Habitat data from the case study watersheds will help calibrate data from a forest-wide network of over 250 stream reaches. We are in the process of determining the utility of the forest-wide habitat data for effectiveness monitoring, or as a tool for assessing aquatic habitat health and overall watershed condition.

Stream Buffer Stability

2006 was the seventh consecutive year that windthrow within stream buffers was monitored. There are currently 237 Riparian Management Areas monitored and they are located on 5 Ranger Districts and are associated with 37 timber sales and 106 harvest units. The orientation of buffers is well represented and varies from 13 buffers with northwest exposure aspects to 40 with an east exposure aspect. Approximately 32 percent of the buffers are associated with streams that have buffers on both sides of the stream while 68 percent of the buffers are associated with streams that only have a buffer on one side of the stream. Approximately 61 percent of the buffers are adjacent to Class III streams (non-fish bearing, water quality concern streams). The remaining 39 percent of the buffers are adjacent to Class I or II streams (anadromous and resident fish bearing streams).

Monitoring results have shown that post harvest windthrow is present in 45 (25%) of the 183 buffers associated with harvest units harvested during the 6 years from 2000 through 2005. The average amount of windthrow in the buffers is 2.3 percent. The amount of windthrow is expressed as the cumulative number of trees windthrown divided by the original number standing trees in a buffer. The cumulative amount of windthrow in the buffers is highly variable and ranges from 0 to 73 percent.

Heritage Resources Question 1: Are Heritage Resources Standards and Guidelines being implemented?

Monitoring shows Forest Plan Standards and Guidelines are being implemented.

Heritage specialists evaluated 108 undertakings in FY 2006 for their potential to affect heritage resources eligible to the National Register. This compares to 111 undertakings reviewed in FY 2005. Monitoring over the last decade and in FY 2006 suggests some sites are being damaged not directly as a result of project implementation, but as remote areas become more accessible.

Heritage Resources Question 2: Are Heritage Resources Standards and Guidelines effective in protecting heritage/cultural resources as expected in the Forest Plan?

The Forest Plan Standards and Guidelines are effective in meeting resource objectives, i.e. site protection and preservation.

Current evidence suggests that Forest Plan Standards and Guidelines are effective in protecting heritage resources. The Tongass National Forest has a strong record of compliance with Section 106 of the NHPA. During FY 2006, Heritage Program staff evaluated 108 undertakings for their potential to affect heritage resources eligible to the National Register. Avoidance of project impacts continues to be an effective mitigation approach.

Tongass National Forest archeologists continued an active program of monitoring site conditions in FY 2006; visiting a total of 321 sites. Sites were monitored across the forest from Ketchikan to Yakutat. Archeologists saw few signs of human-caused impacts or accelerated natural impacts at the monitored sites.

The statistical results of the FY 2006 monitoring program indicate that 318 of 321 monitored sites are either undisturbed or deteriorating from natural processes (e.g. organic decomposition, soil compaction).

Most of the human-caused damage occurred prior to implementation of the Forest Plan Standards and Guidelines for heritage resources. Evidence suggests the Standards and Guidelines have been effective in reducing the level of human-caused damage to heritage resources. Human-caused impacts do, however, continue to occur primarily at the more visible sites.

Karst and Cave Question 1: Are Karst and Cave Standards and Guidelines being implemented?

The Karst and Cave Standards and Guidelines outlined in Forest Plan were implemented to the fullest extent practicable.

Forest Plan Karst and Cave Standards and Guidelines were applied to the following projects: DEIS or FEIS input into the Gravina, Logjam, Tuxekan, Kosciusko, Scratchings, Kuiu Roaded, and Iyouktug Timber Sale Projects. Karst and cave resource evaluation was provided for the Thayer Creek Hydropower Project for the community of Angoon on Admiralty Island. Karst resource input was provided for a number of sales associated with the Small Sales Program on Thorne Bay Ranger District on Prince of Wales Island. Particular emphasis was placed on the inventory and design of the prescriptions and mitigation proposed for commercial thinning opportunities such as the Naukati and Winter Harbor Stand No. 587120524 of the Prince of Wales Wildlife Enhancement Commercial Thinning Proposal.

Substantial changes have been suggested to the Karst and Cave Resource Guidelines for the 2006 Forest Plan Amendment effort that will hopefully better define the karst management strategy and vulnerability assessment process.

Karst and Caves Question 2: Are karst and cave Standards and Guidelines effective in protecting the integrity of significant caves and the karst resource?

The Karst and Cave Standards and Guidelines outlined in Forest Plan and as modified by effectiveness monitoring ensure a high level of protection for significant caves and karst resources overall.

Effectiveness monitoring has been historically tied to post harvest monitoring and preliminary cave resource inventories. In 2006, little logging occurred on karstlands where mitigation had been prescribed. Monitoring of some of the small sales on the Thorne Bay Ranger District was conducted to evaluate the effectiveness of proposed mitigation. Monitoring of these sites found that prescriptions such as partial suspension and buffer windfirmness were achieved. Limited subsurface monitoring was accomplished. These included subsequent trips into known cave systems to document changes and preharvest inventory of karst features to establish baseline inventories.

Monitoring of the effectiveness of the implementation of the Standards and Guidelines over the past few years has shown the need for clarification of the implementation procedures and identified changes to the standards needed. These changes were implemented in the Logjam, Staney, Iyouktug, and Kosciusko, Tuxekan, and Scratchings Projects. Changes to the current published standards and guidelines have been proposed for the ongoing Forest Plan Amendment. These changes capture the findings of past effectiveness monitoring and hopefully provide clarification of the implementation procedures.

In 2006, the Geology SCEP student working on a Masters thesis completed a study within two un-harvested watersheds on Northern and Central Prince of Wales Island. The results of this study will provide a basis for further understanding the forest – karst dynamics in temperate rainforests. The storm events for this period and the storm hydrographs developed will be analyzed. The response of old growth karst watersheds to storm events will generate baseline data from which the effects of timber management can be modeled. Also in 2006, a Masters Thesis study was completed and successfully defended which looked at the influence of organic acid on limestone dissolution. The research covered the changing chemistry over the karst gradient as the muskeg waters change into buffered karst waters measured field dissolution rates for both the muskeg and the karst resurgence waters.

Land Management Planning Question 1: Is the management of National Forest System lands consistent with management objectives of adjacent land and their management plans?

No projects approved in FY 2006 were found to be inconsistent with the plans of the agencies regulating the adjacent non-National Forest System lands during 2006. Efforts of the Forest Service to improve government-to-government relationships through collaboration have continued.

Local and Regional Economics Question 1: Are the effects on employment and income similar to those estimated in the Forest Plan?

The differences between the Forest Plan estimates and actual employment earnings data are described and interpreted below.

Wood Products: The Forest Plan employment and earnings figures include activities associated with private, state, BIA, Forest Service and Native Corporation timber harvesting. Employment in the woods projects sector currently is much lower than predictions in the 1997 Forest Plan FEIS.

Recreation and Tourism: The recreation and tourism estimate in the Forest Plan, as explained previously, was not recalculated for this analysis; instead, employment for the Retail and Service sectors is used because recreation and tourism are included in this sector. We assume that the retail and service sector trends mirror the trends in recreation and tourism. The Forest Plan estimate includes an estimate of self-employment and assumes full implementation, with all opportunities for recreation and tourism being fully developed. The employment data from the State does indicate a slight increase in those sectors during the last four years that are associated with tourism and recreation activities.

Commercial Fishing: State data do not include self-employed commercial fishing activities. Therefore, the seafood-processing sector is used as a proxy for general trends in the fishing industry. Current trends in the salmon harvesting and processing are more likely a reflection of global market conditions and the related price per pound of fish than Tongass management activities. The data for the last four years show a slight upward trend.

Mining: There is a large difference in employment and earnings between what is shown in the Forest Plan and the actual 2005 mining employment (2006 figures are not available at the time of this publication). The Forest Plan assumes full implementation of the mining potential. In 2006, only the profitable mining sites were operating. When the Kensington Mine opens, there will be more employment. Ore prices must rise and expenses must fall before there is full employment.

Regional Picture: Overall, the Forest Plan predictions are higher than the state data that show little growth in recent years in SE Alaska. The timber sector declined in employment and earnings. Seafood processing has not grown much. In addition, there is a significant difference between employment levels predicted in the Forest Plan and those reported in the Alaska Department of Labor. Forest Plan figures include self-employed people and the state data do not. This leaves out most commercial fishermen, doctors, and businessmen, among others.

Minerals and Geology Question 1: Are the effects of mining activities on surface resources consistent with Forest Plan expectations, as allowed in approved Plans of Operations?

Tongass-wide, two large locatable mine plans were administered as well as five small-scale or exploration-drilling programs. Numerous small and free-use mineral material operations were processed on the Tongass National Forest for FY2006. The mineral material permits were predominantly issued on the Craig and Thorne Bay Ranger Districts due to the extensive road system on Prince of Wales Island.

Fiscal Year 2006 inspections of mineral sites indicate that the effects of mining activities on surface resources are consistent with Forest Plan expectations. The necessity of the operator to obtain approval for their Plan of Operations provides the Forest Service the opportunity and authority to control the effects of the development on the Forest surface resources.

Recreation and Tourism Question 1: Are areas of the Forest being managed in accordance with the prescribed Recreation Opportunity Spectrum (ROS) class in Forest-wide Standards and Guidelines?

Information related to the ROS and the Recreation and Tourism Standards and Guidelines were being incorporated into special use decisions. In reviewing documents for management actions, there was a review of changes to the ROS based on proposed alternatives. All documents

appeared to be consistent with direction in the 1997 Tongass Land and Resource Management Plan (Forest Plan) for the recreation resource.

Recreation and Tourism Question 2: Is Off Road Vehicle (ORV) use causing, or will it cause considerable adverse effects on soil, water, vegetation, fish and wildlife, visitors or cultural and historic resources of the Forest?

Off Road Vehicle (ORV) impact to the soil productivity and water quality monitoring showed that in general, ORV use is causing neither considerable impact nor adverse effects on soil and water resources on the Tongass. The primary ORV use on the Tongass has been ATVs and snowmobiles. Snowmobiles generally use forest roads and higher alpine areas although some use was reported in the Stikine-LeConte Wilderness. Use of this equipment is restricted to times when there is adequate snow cover as provided by the Alaska National Interest Lands Conservation Act (ANILCA).

Generally, the impacts caused from ATV use have been minor damage to wetlands and soil rutting. In response to these site-specific impacts, the districts worked to educate the public on soil and water resource protection and enforcement to ensure compliance. Monitoring has shown some disturbance to soil, water, and wetland resources and evaluation of the impacts is ongoing.

Research Question 1: Have the identified high-priority information needs been fulfilled?

Most of the high priority information needs listed in Appendix B of the 1997 Forest Plan have been met or are well on the way of being met. The Tongass Leadership Team, in cooperation with the Pacific Northwest Forest Experiment Station (PNW), developed additional research needs on October 10, 2002. Refer to the 2003 Tongass Monitoring Report for a complete list of these new research needs. In 2006 those research programs continue in various disciplines that include geology, forestry, economics and social, wildlife, fisheries, and geology. The 2006 Monitoring Report describes some of the research projects related to the 2002 agreement. The 2006 report also cites 21 recent publications and papers related to the 2002 agreement.

Scenery Resource Question 1: Are the Standards and Guidelines effective in attaining the adopted Visual Quality Objectives established in the Plan?

No scenery monitoring was reported for FY2006. According the Tongass Forest Plan the monitoring was to initially be conducted 3-5 years after adoption of the plan then at 5 year intervals thereafter (Tongass Land Management Plan, 1997 page 6-9).

Soil and Water Question 1: Are the Standards and Guidelines for soil disturbance being implemented?

Soil disturbance Standards and Guidelines are being implemented based on assessment of Best Management Practices (BMPs), 100 percent monitoring and quality control checks by interdisciplinary teams. The 100 percent monitoring for BMP implementation was completed on units final inspected and roads that were substantially complete and final inspected for construction. IDT quality control monitoring of a subset of the 100 % monitoring sites provided verification the implementation monitoring process was consistent. This monitoring covered 31 harvest units and 25 roads and road segments. The IDT reviewed 4 units, 6 road construction sites. In the units and roads monitored the BMPs relative to soil disturbance were implemented and there were no incidence of significant disturbance noted.

The monitoring showed that the Tongass is implementing the Standards and Guidelines for soil disturbance successfully during timber sale administration and road construction. The BMPs related to soil disturbance were implemented and monitored 115 times. Two departures from full BMP implementation were reported and one corrective action was reported. The departures occurred on a road and in a rock pit where there was an over blast and the road was overbuilt. Immediate corrective action was taken to minimize the impact of the road construction. Corrective actions were taken during sale administration to ensure implementation of the Standards and Guidelines.

Continued emphasis is necessary during initial unit planning and layout phases of timber harvest to implement measures that minimize mass failures and landslides on over steep sections and areas that indicate unstable soils. Application of partial suspension and full suspension has contributed to limiting soil disturbance. Focus on understanding the actual BMPs and the guidelines associated with monitoring will continue through communication and training.

Soil and Water Question 2: Are the Standards and Guidelines effective in meeting Alaska Regional Soil Quality Standards?

Soil and water effectiveness monitoring is completed through monitoring the soil quality standards as described in Forest Service Manual 2554, and is addressed in two parts: 1) Soil Disturbance, and 2) Landslide frequency. Limited soil quality monitoring was done in 2006 but no report has been completed.

Soil and Water Question 3: Are Best Management Practices being implemented?

Soil and Water BMPs are being implemented as shown through the 100 percent monitoring of units final inspected and roads substantially complete and final inspected. This effort is validated through the Interdisciplinary Team (IDT) quality control monitoring. This monitoring covered 957.39 acres of harvest units with 133.91 acres monitored by the IDT.

The BMPs were implemented and monitored 395 times. During the review, corrective actions were used in 7 cases in the process of implementing the BMPs. Nine cases of departures from full BMP implementation were reported during road construction of 4 roads and harvest of 2 units.

Corrective actions mitigated the incidents in most of the situations. These corrective actions contributed to no net loss of implementation; however in a few cases associated with seeding and stream cleanout the corrective actions were not implemented during the FY2006 operating season. In these situations, seeding for erosion control has been directed and is anticipated to occur before the timber sale is closed. Ongoing corrective action is occurring at one of the LTF sites where the site will be upgraded to provide additional prevention of sediment transport. The IDT monitoring was in agreement with the 100 % monitoring. Overall the BMPs are being implemented in timber harvest and road construction.

Soil and Water Question 4: Are Best Management Practices effective in meeting water quality standards?

The Forest Plan directs us to attain State of Alaska water quality standards. As part of the Forest Plan aquatic monitoring synthesis, long term monitoring is underway in three case study watersheds. A goal of the Aquatic Synthesis is to evaluate watershed-scale influences on water quality, including the effectiveness of Best Management Practices at attaining water quality

standards. Stream water quality sensors (temperature and turbidity) were installed in 2004 in each watershed. Data analysis is in progress.

Attainment of state water quality standards is a specific Forest Plan objective driving the Aquatic Synthesis. Continuous water quality instruments have been installed in each case study watershed. We are within a calibration period for evaluating reference water quality in the case study watersheds.

No changes to Forest Plan Standards and Guidelines for attaining State of Alaska water quality standards in the Tongass National Forest are recommended at this time. Some policy clarifications are proposed in the Forest Plan Amendment currently underway.

Subsistence Question 1: Are the effects of management activities on subsistence users in rural Southeast Alaska communities consistent with those estimated in the Forest Plan?

In 2006, ten projects are already funded. Most of these were approved as part of the 2004 Monitoring Plan and most projects address assessment of salmon stocks or subsistence fisheries for salmon. Most of the Monitoring Program is directed at assessment of sockeye escapements that support subsistence fisheries for salmon. Additional assessment of Prince of Wales Steelhead and salmon harvest surveys in Sitka were added in subsequent years.

Three Forest projects were approved for funding in 2006; two were stock status and trends projects and the third was a harvest monitoring/traditional knowledge project. The projects met the technical requirements but there were insufficient funds to fund all three.

Kutlaku Lake Stock Assessment was fully funded. The other two projects will be implemented during 2007.

Guidelines to evaluate future studies were developed in 2006 as a Strategic Plan for the Subsistence Fisheries Resource Monitoring Program. Within the 5-year planning horizon for this document, the need for continuation of assessments will be evaluated. An important consideration for continued assessments of strategically important stocks is whether the research objectives promote continuation of subsistence uses. Several projects now have 3 or more years of data. Part of the strategic planning process is assessing the need for additional data with existing systems or initiating new monitoring plans for systems with limited or nonexistent data.

During 2006, the second year of funding was provided for the first year of the field studies phase to estimate the abundance of deer on Prince of Wales and surrounding islands (Game Management Unit 2). This study is designed to evaluate the benefits and efficiency of conducting deer population assessments using genetic technology. The study is a cooperative project between the Alaska Department of Fish and Game, the University of Alaska and the Hydaburg Cooperative Association.

Timber Management Question 1: Are timber harvest activities adhering to applicable timber management Standards and Guidelines?

There were 3735 acres fully or partially harvested during FY 2006. Of the 3735 acres, 2863 acres were sold under the 1979 TLMP (category 1 and 2 timber sales). 866 acres resulted in the creation of an opening. Of the 866 acres of openings, 305 acres were sold under the 1979 TLMP (category 1 and 2 timber sales). The remaining acres were harvested under category 3 and 4 sales. The 100-acre size limitation applies to all harvest units that create an opening. No openings exceeded 100 acres in size.

Of the total 2006 harvest, there were 2 units that may have been harvested within the 100 ft. TTRA stream buffer. These units are on the Hoonah and Thorne Bay Ranger Districts. The GIS covers indicate an overlap between the harvest and the stream buffers. We expect this is due to poor vertical integration between the streams and harvest GIS map covers and not an actual incursion into the buffer by the harvest unit. However, these units will be field verified during fiscal year 2007. The status will be reported in the 2007 Monitoring and Evaluation Report, timber question 1. One of the units was harvested under category 3 timber sales and the other under category 4.

We reported last year that four units on the Thorne Bay Ranger District were to be field verified for possible harvest in TTRA buffers. Thorne Bay staff did not field verify these units during 2006 and are subsequently scheduled for 2007. We will report on these four units in next years (2007) report, Timber Management question 1.

Timber Management Question 2: Are harvested forested lands restocked within five years following harvest?

The results show that 100 percent of forestlands harvested in 2001 were adequately restocked within five years.

Timber Management Question 3: Is the Allowable Sale Quantity (ASQ) consistent with resource information and programmed harvest?

The Allowable Sale Quantity for the Tongass is 267 MMBF. In FY 2006, 24 MMBF was offered. The sold volume for FY 2006 was 85 MMBF and the 43 MMBF was harvested.

No action is necessary at this time. Recommendations follow to continue to monitor.

Timber Management Question 4: Are the Non-Interchangeable Components (NIC) of the allowable sale quantity (ASQ) consistent with actual harvest?

It is uncertain at this time that the non-interchangeable components of the allowable sale quantity are inconsistent with actual harvest. The uncertainty is due in part to the limited number of years of data and the poor market conditions and high fuel costs of FY 2006.

No action is necessary at this time. Recommendations follow to continue to monitor the trend of harvest from NIC II lands.

Timber Management Question 5: Is the proportional mix of volume in NIC I and NIC II accurate, as estimated in the Forest Plan?

The non-interchangeable components (NIC I and NIC II) of the timber cutting areas harvested during FY 2006 were compared to the Forest Plan Operability GIS layer for each NIC category. The information indicates that the accuracy of comparison of planned harvest (projected in the Forest Plan) to that implemented on the ground by logging system is variable.

No action is necessary at this time; continue to monitor the proportional mix of harvest from NIC II category lands.

Timber Management Question 6: Should maximum size limits for harvested areas be continued?

In fiscal year 2006, there were no units over 100 acres in size. Trends in harvest opening size have been toward smaller openings and less reliance on the even-aged silvicultural system. The 27 openings averaged 32 acres, and ranged in size from 5 acre to 96 acres. Forest Plan standards

and guidelines for scenery and sensitive species such as Northern goshawk and American marten, and soil and water BMPs emphasize smaller sizes. Also, emphasis on leaving old-growth structure in harvest areas is resulting in smaller harvest openings. Of the 866 acres managed via the even-aged system, 43 percent retained a portion of the original stand structure, while the remaining 57 percent received a traditional clearcut.

In addition to the harvests discussed above, 12 stands were harvested using uneven-aged management totaling 2,578 acres. There were 5 stands harvested using two-aged systems for a total of 276 acres. There were 2 stands salvaged or sanitation harvested for a total of 15 acres.

Transportation Question 1: Are the Standards and Guidelines used for forest development roads and log transfer facilities effective in limiting the environmental effects to anticipated levels?

National Forest System Roads

The monitoring results indicated that removing structures then constructing mounds with the excavated material can be effective roadway features when used to block access to motorized traffic on both system roads and unauthorized roads. The strategy can be effective if placed in locations that provide no alternative to go around the closure. During previous years of monitoring road closures, removed structures have been circumvented by off highway vehicles to some degree. However, carefully choosing the location of the device in relation to the local terrain can eliminate motorized traffic.

Log Transfer Facilities (LTF)

Two general types of monitoring occur: upland and marine. The upland monitoring is summarized into assessments developed by Forest Service timber sale administrators, and is recorded under the general categories of "Fuel Control," "Runoff Control," and "Bark and Debris." These assessments were made for all the active sites. Contracted divers perform underwater bark debris surveys to accomplish marine monitoring.

Bark monitoring dives were conducted at 1 LTF in 2006, Yakutat Bay 6 with Zone of Deposit of 0.20 acres.

Oil Sheen Monitoring

In 2006, all active log transfer facilities were operated in accordance with their permits. The cases where fuel/hydraulic fluid spills were a problem were handled as specified in the Spill Prevention Control and Counter Measure Plan (SPCC) anticipated in their operating plans.

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

The Tongass National Forest has fulfilled the intent of the Standards and Guidelines during fiscal year 2006 in avoiding wetlands where practicable. Forested wetlands were most affected by disturbance from road construction. Prescriptions for unit harvest and road construction are developed and implemented to minimize impact to wetlands. Timber harvest is not a restricted activity on forested wetlands, according to the Forest Plan.

Best Management Practices for Wetland Protection Measures noted 48.86 acres identified through the 100 percent implementation monitoring effort and the IDT percent quality control monitoring reviewed 16.86 acres of wetland. Results of the monitoring of units and roads in FY 2006 concluded that the BMPs were implemented. During this monitoring no corrective actions

were noted relating to deletion of some part of the units that contributed to protect wetlands. Some portions of units were deleted and roads were relocated due to other concerns that provided additional protection to wetlands. No departure of full BMP implementation associated with wetlands resources was noted.

Wetlands 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.

Wild and Scenic River Question 1: Are Wild, Scenic, and Recreational River Standards and Guidelines being implemented?

The standards and guidelines are being implemented for the free flowing conditions and outstandingly remarkable values for eligible rivers on the Tongass National Forest.

Wild and Scenic River Question 2: Are Wild, Scenic, and Recreational River standards effective in maintaining or enhancing the free flowing conditions and outstandingly remarkable values at the classification level for which the river was found suitable for designation as part of the National Wild and Scenic River System?

Data was collected by the Petersburg High School at the LeConte Glacier. The survey information is shared nationally and internationally with groups interested in glaciology and global warming. This information has been collected and shared since the early 1980's. Use of a helicopter within the Stikine-LeConte Wilderness was approved by the Regional Forester.

Other data collected for rivers were in concert with either the administration of outfitter/guide permits or as a part of plant inventories for invasive and sensitive plants.

With the exception of the proposed timber sale near the Thorne River, there have been no additional evaluations of impacts to recommended Wild and Scenic Rivers on the forest to evaluate the effectiveness of the standards and guidelines.

Monitoring completed on the Tongass showed that the Standards and Guidelines are being implemented and are effective in maintaining the free flowing conditions and outstanding remarkable values for eligible rivers.

Wilderness Area Question 1: Are Standards and Guidelines for the management of Wilderness being implemented?

In general, the Standards and Guidelines for the management of Wilderness are being implemented. The geographic distribution and expanse of the 19 Wilderness units totaling 5.7 million acres, make monitoring of the implementation of Standards and Guidelines difficult.

Wilderness Area Question 2: Are Standards and Guidelines for the management of Wilderness effective in maintaining the Wilderness resource?

Standards and guidelines for Wilderness are necessary and effective in maintaining the Wilderness resource. Monitoring of Wilderness Standards and Guidelines is supported through repeated observation and documentation using standard protocols and scientific methods. Application of monitoring protocols and further refinement of the Wilderness Standards will continue in an attempt to help reach the Forest Service 10 Year Wilderness Stewardship Challenge of having all wildernesses eventually managed to standard. Additional focus will be placed on monitoring levels of use and quantifying the monitoring data. Further development of the Wilderness standards and guidelines would be useful. Specific clarification of these standards and guidelines as well as protocols needs to be developed.

Wildlife Question 1: Are population trends for Management Indicator Species (MIS) and their relationship to habitat changes consistent with expectations?

Yes. Timber harvest and road construction on the Tongass has been consistently much less than expected in the 1997 Tongass Land and Resource Management Plan (Forest Plan). Therefore, actual management effects on MIS populations have been less than projected in the Plan.

Thinning projects on the Tongass offset the effects of the stem exclusion stage in providing more light to the forest understory and improving growing conditions for herbaceous and woody species that wildlife depends on for forage. Restoring second growth, through silvicultural thinning, benefits wildlife by increasing the forage base for browse dependent species and increasing the health of the residual stand. It also reduces the standing stock to a level that encourages better growing conditions through increased light and reduced competition for light, growing space and nutrients within the treated stand. In 2006, approximately 4,800 acres were pre-commercially thinned on the Tongass.

Wildlife Question 2: Are the population levels and associated distribution of mammalian endemic species on islands and portions of the mainland consistent with the estimates of the Forest Plan?

Although researchers have made headway in documenting endemic species, they have only field surveyed a small portion of Southeast Alaska in the last decade. As a conservation measure, Forest Plan Standards and Guidelines exclude timber harvesting on islands smaller than 1,000 acres.

The Pacific Northwest Research Station has recently completed a long-term study of the evolutionary diversity and ecology of endemic mammals in Southeast Alaska. The study focused primarily on the northern flying squirrel (*Glaucomys sabrinus*) and the southern red-backed vole (*Myodes gapperi*).

At the time that the study began, it was generally believed that these species were closely associated with old-growth forests in Southeast Alaska. However, it was found that abundant, non-commercial forests contribute to breeding populations of northern flying squirrels in Southeast Alaska. Red-backed voles may also exist in managed young-growth stands that

originated from clearcut logging of old-growth forests, but young growth stands are likely less productive relative to this species.

Costs and Outputs Question 1: What outputs were produced in the previous year (2006)?

This output information was obtained from the final Fiscal Year (FY) 2006 Performance Accomplishment Report submitted to the Regional Office. Additional information came from the Annual Reforestation and Timber Stand Improvement Report or Timber Information Management (TIM) System; Forest Accomplishment Tracking System (FACTS), the Annual Roads Accomplishment Report, and the INFRA database. This output report generally follows the order of the Performance Accomplishment Report. The output tables in some of the previous years followed a different order.

Outputs for FY 2006 by Resource

RESOURCE	FY 2006
ROAD MAINTENANCE OR CONSTRUCTION	
Miles of road constructed	21.7 miles
Road improvements	14.8 miles
Road improvements deferred maintenance	13.0 miles
Miles of road decommissioned	2.9 miles
Total miles of high clearance road maintained at objective maintenance level (Level 1 & 2)	1385.0 miles
Miles of high clearance roads maintained	715 miles
Total miles of passenger car roads maintained at objective maintenance level (Level 3, 4, & 5)	602.8 miles
Miles of passenger car roads maintained	610.0 miles
LAND MANAGEMENT PLANNING	
Land Management Plan (LMP) amendments underway	1 amendments
INVENTORY	
Above project integrated inventories	4,962,520 acres
Conduct watershed assessments	5 assessments
GIS resource mapping (Tongass includes 12 geographic tile units and the updates are completed by resource category)	238 tile units in 26 resource categories
MONITORING	
Land Management Plan (LMP) monitoring and evaluation reports completed	1 report
National visitor use monitoring	0 survey days

RESOURCE	FY 2006
RECREATION MANAGEMENT	
Recreation special use authorizations administered to standard	173 permits
PAOT days administered to standard	609,000 PAOTS
Recreation interpretation & education products provided to standard	139 products
Wilderness areas managed to minimum stewardship level	0 areas
Recreation days managed to standard (General forest areas)	19,300 days
HERITAGE MANAGEMENT	
Heritage resources managed to standard	56 sites
WILDLIFE HABITAT MANAGEMENT	
Terrestrial wildlife habitat restored or enhanced	619 acres
Provide wildlife interpretation and education	20 events
FISH HABITAT MANAGEMENT	
Lakes restored or enhanced	4531 acres
Streams restored or enhanced	88 miles
Provide fish interpretation and education	7 events
FOREST MANAGEMENT	
Timber management (NEPA) documents	8 signed documents
Establish forest vegetation	0 acres
Improve forest vegetation	4714 acres
Natural regeneration w/o site preparation	640 acres
Fertilizing established stands	0 acres
Certification of tree planting	154 acres
Special products permits administered	325 permits
Timber volume offered	23.66 MMBF
Timber volume sold	23.66 MMBF
Timber volume harvested	43.16 MMBF
VEGETATION AND WATERSHED MANAGEMENT	
Noxious weed treatment	30.9 acres
WATERSHED IMPROVEMENT	
Soil & Water resource improved	648 acres

RESOURCE	FY 2006
MINERALS AND GEOLOGY	
Mineral plans of operations administered	11 operations
Mineral plans of operations processed	38 operations
Geologic resources and hazard assessments completed	100 assessments
LAND OWNERSHIP MANAGEMENT	
Cases resolved through litigation or processed through administrative procedure	14 cases
Authorizations administered to standard	155 authorizations
Land use proposals and applications processed	32 applications
Boundary lines maintained	27 miles
Acres acquired or conveyed	593.63 acres
Rights-of-way acquired	3 number
Number of energy facility applications processed within prescribed timeframes	0 application
Hydropower projects	14 project
TRAIL MAINTENANCE OR CONSTRUCTION	
Miles of trail maintained standard	203 miles
Miles of trail improved to standard	6 miles
FACILITIES MAINTENANCE OR CONSTRUCTION	
Number of facilities maintained to standard	491 facilities
LAND ACQUISITION	
Acres acquired	208.1 acres

Costs and Outputs Question 2: Are the costs associated with carrying out the planned management prescriptions (including those of producing outputs) consistent with those costs estimated in the Forest Plan?

The annual costs estimated in the 1997 Forest Plan were only guidelines. Since the plan was made, the budget line items (BLIs) have been changed and rearranged enough that a direct item by item comparison would be very difficult at best. The first decade the Forest Plan annual total estimated budget may be more valid to compare. The Forest Plan estimated budget was \$68,925,000 per year. The allocated FY 2006 budget was \$54,289,620 (not counting KV and Salvage Sale). In FY 2006, a certain amount of the allocated budget was held in the Washington Office in overhead “pools”. That means that the actual allocated budget was higher than \$54,289,620. These pools did not exist in the Forest Plan projected yearly budget.

The annual costs for KV and Salvage Sale funds estimated in the 1997 Forest Plan were \$2,660,000 per year. The allocated KV and Salvage Sale budget authority for FY 2006 was \$784,000. The lower levels of timber harvest experienced on the Tongass in recent years are reflected in the declining KV program collections and expenditure levels.

Photo: Radio-collared Moose near Yakutat



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