**United States Department of Agriculture**

**Forest Service**

**Alaska Region**

**Chugach National Forest**

**August 2008**

# CHUGACH NATIONAL FOREST

**Off-highway vehicle trail on Hawkins Island, summer 2007**

# FY2007 Forest Plan Monitoring and Evaluation Report

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## EXECUTIVE SUMMARY

The Forest Plan and subsequent documents established 43 general monitoring questions for the Chugach National Forest. Included are three questions added after the Plan was published. One had been left out inadvertently and two were added as a result of appeal decisions. In fiscal year 2007 (FY2007), 3 of the 43 questions were monitored (air quality, summer off-highway vehicle use, and dusky Canada geese). Results of this monitoring are displayed in this report. The other questions were not monitored due to either monitoring protocols not being completed or approved, lack of funding, or monitoring schedules that did not require monitoring in FY2007.

## CERTIFICATION

I have reviewed the FY2007 Forest Plan Monitoring and Evaluation Report for the Chugach National Forest. Under laws and regulations in effect at the time the Forest Plan was revised (May 31, 2002) a forest plan is generally revised every 10 to 15 years, or whenever the Forest Supervisor determines that conditions or demands have changed. This is the fifth year implementing the Revised Land and Resource Management Plan. Based on the monitoring results in this document, I am satisfied that the revised Forest Plan is sufficient to guide management of the Forest and that there is no need to change the plan at this time.

This report is approved.

JOE L. MEADE
Forest Supervisor

Date

## INTRODUCTION

This is the annual monitoring and evaluation report for fiscal year 2007 (FY2007) for the Chugach National Forest Revised Land and Resource Management Plan (Forest Plan). The Forest Plan provides guidance for all resource management activities on the Chugach National Forest. It does this in part by establishing Forest-wide goals, objectives, and management direction. The monitoring and evaluation process is used to ensure that Forest Plan direction is being implemented, is effective, and is not causing effects that were not predicted in the Forest Plan's Final Environmental Impact Statement (FEIS). The evaluation process is also used to assess progress in achieving the desired conditions, goals, and objectives, and to verify that assumptions made in the Forest Plan and FEIS are valid.

The Forest's monitoring and evaluation strategy is located in Chapter 5 of the Forest Plan. The strategy outlines the basic elements of the monitoring program, establishes a Monitoring and Evaluation Interdisciplinary Team (MEIT), and defines 40 key monitoring questions. Three questions were added after the Forest Plan was published, resulting in 43 items to be monitored. The three additional questions included one left out inadvertently (monitoring of mountain goat, a management indicator species), and two added as a result of appeal decisions (air quality and summer off-highway vehicle use). All Forest Plan monitoring is directed toward answering these 43 general monitoring questions.

The MEIT developed protocols with specific monitoring details for many of the general questions. Some protocols that were previously completed are currently being revised. Until this effort is complete, monitoring efforts may be minimal or non-existent for many items. Protocols are documented in the Monitoring Guide and their revision occurs outside of the forest planning process in order to be responsive to the best available science. A copy of the most current Monitoring Guide can be obtained from the Supervisor's Office.

The Record of Decision (ROD) for the Forest Plan acknowledged a need for obtaining information about the effects of winter snow machine use on ungulates and bears. The Forest regards this as a study to address specific informational needs, not as Forest Plan monitoring; therefore, no information is presented in this document on this subject.

## MONITORING ITEMS

All Forest Plan monitoring questions are presented below with a summary of results for FY2007, including items for which no monitoring occurred. Reasons questions were not monitored in FY2007 include: (1) monitoring question being reviewed, (2) monitoring protocol in development, (3) lack of funding, and (4) monitoring schedules that did not require monitoring to take place in FY07. Please refer to the Chugach Forest Plan Monitoring and Evaluation Strategy in Chapter 5 of the Forest Plan for the ranking criteria and process.

The general monitoring questions are grouped by monitoring purpose or applicable resource category (e.g., soil resources), and are in the same order as presented in Chapter 5 of the Forest Plan. The three items that were added after the Plan was published are at the end in a category called "Additional Questions".

For each general monitoring question, the frequency (i.e., schedule) of data collection and evaluation are displayed as presented in Chapter 5 of the Forest Plan. The schedules represent expectations under maximum funding levels. In some cases, the collection and evaluation frequencies are different than what is documented in the Monitoring Guide. The schedules in the Monitoring Guide have not yet formally replaced the schedules established in the Forest Plan. A table displaying the status of monitoring by fiscal year begins on page 20.

Monitoring results are summarized only for items monitored in FY2007 and include (1) recommendations for remedial action, and (2) actions taken in FY2007 to respond to previous recommendations. The monitoring strategy specifically calls for these items to be included in the annual reports.

## Compliance with Revised Forest Plan

**Are projects being implemented consistent with the Forest Plan direction?**

- Frequency of Collection: Once every 5 years
- Frequency of Evaluation: Every 5th year
- Status in FY2007: Not monitored (protocol being developed)

## Integrated Effectiveness/Validation Monitoring

**Are management activities achieving their intended outcomes?**

- Frequency of Collection: Annual
- Frequency of Evaluation: Every 5th year
- Status in FY2007: Not monitored (monitoring question being reviewed)

**To what extent is ecosystem composition and structure changing and has forest management influenced these changes? How do these changes compare to the expected range?**

- Frequency of Collection: Annual
- Frequency of Evaluation: Every 5th year
- Status in FY2007: Not monitored (protocol being developed)

## Soil Resources

**What is the level of ground disturbing activity?**

- Frequency of Collection: Annual
- Frequency of Evaluation: Every 5th year
- Status in FY2007: Not monitored (protocol being developed)

## Water Resources

**What is the existing water quantity?**

- The MEIT assigned very low priority to this item because it is considered a research item rather than a monitoring question. The Forest Leadership Team agreed and decided that no monitoring would occur in FY2007.

**Are Best Management Practices (including wetland management) effective in meeting water quality standards?**

- Frequency of Collection: As scheduled
- Frequency of Evaluation: Every 5th year
- Status in FY2007: Not monitored (protocol completed, but not yet approved)

## Sensitive and Exotic Plant Species

**What is the abundance and distribution of sensitive plants in areas affected by management activities?**

- Frequency of Collection: Annual
- Frequency of Evaluation: Every 5th year
- Status in FY2007: Not monitored (protocol being developed)

**What is the distribution and abundance of exotic plants, particularly in areas affected by management activities?**

- Frequency of Collection: Annual
- Frequency of Evaluation: Annual
- Status in FY2007: Not monitored (protocol being developed)

## Management Indicator Species

**What are the population trends for Management Indicator Species (MIS) and their relationship to habitat? Are MIS truly reflective of all fish and wildlife species on the Forest?**

Note: The MEIT assigned low priority to this item because: (1) the first component is redundant with the general monitoring questions for specific MIS, and (2) the second component is more appropriate as a research item than a monitoring question. In FY2007, the Forest Leadership Team agreed and decided no monitoring would occur and recommended that this question will be dropped from Forest Plan and Monitoring Guide.

**Has the Revised Forest Plan direction prevented adverse interactions between bears and humans?**

- Frequency of Collection: Annual
- Frequency of Evaluation: Every 5th year
- Status in FY2007: Not monitored (protocol not completed)

**What are the population trends for brown bear and the relationship to habitat?**

- Frequency of Collection: Every 3rd year
- Frequency of Evaluation: Every 5th year
- Status in FY2007: Not monitored or evaluated[1]

**What are the population trends for dusky Canada geese and the relationship to habitat?**

- Frequency of Collection: Every third year by Forest Service, annual by other agencies
- Frequency of Evaluation: Every 3 years
- Status in FY2007: Monitored and evaluated

As the primary land manager for the Copper River Delta, the Forest Service is responsible for assessing habitat-related changes in the dusky Canada goose population. In 1993, the Forest Service began a cooperative project with Alaska Department of Fish and Game (ADF&G) and the U.S. Fish and Wildlife Service (USFWS) to estimate the number of dusky Canada geese, compare ground-based estimates with aerial survey estimates, and describe habitat use. The project relied on ground searches of random plots. These searches have been conducted concurrently with aerial surveys every three years since 1993.

In FY2007, the Forest Service conducted nest searches on 50 random plots throughout the western Copper River Delta and compared this data to data collected in 1998, 2001, and 2004. Based on data from previous years, the study area was divided into 4 strata: Medium, Low, Sparse, and New Marsh. A completely random design across all strata was used for searches in all 4 years. The same area was surveyed each year except that Egg Island was dropped from the search area in 2001 because of extremely low nest density. Details of the survey and results are described in the 2007 monitoring report, *Dusky Canada Goose Nest Density on the Copper River Delta, AK*, prepared by Jason Fode and Paul Meyers. A summary of that report follows.

In FY2007, crews randomly selected 50 9-ha (300x300-m) plots from a grid encompassing the entire breeding area. Plot boundaries were overlaid onto orthophotos in ArcMAP and plot corners were determined on the ground with hand held GPS units. Crews walked transects 5–15 meters apart through the entire plot and recorded data on all waterfowl nests, including species, location, number of eggs, and evidence of predation. For Canada geese, they candled at least 2 eggs from each nest to determine the approximate stage of incubation (Weller 1956). They

[1] Populations of these species are being monitored by other agencies. Chugach National Forest will use these data rather than duplicating monitoring efforts.

recorded 3 levels of habitat associated with goose nests: 1) Landform type on which the nest was located, 2) vegetation in a 1-$m^2$ centered on the nest, and 3) plant community in the 0.1–2 ha area surrounding the nest.

A higher proportion of low-density plots were searched in FY2007 than in previous years: 23 plots (46%) landed in low-density areas, 21 plots (42%) in sparse-density areas, 4 plots (8%) in medium density, and 2 plots (4%) in new marsh.

Crews found 32 nests, which was less than past years: 36 nests in 2004, 48 nests in 2001, and 70 nests in 1998. This difference was probably due to the higher proportion of low and sparse density plots searched. Nest density (nests/$km^2$) in Medium, Low, Sparse, and New Marsh was 19.4, 7.25, 5.29, and 0 respectively. Nest density did not differ among years in Medium (df = 3, $p$ = 0.40), low (df = 3, $p$ = 0.11), or Sparse (df = 3, $p$ = 0.57) density strata. The sample size was small for the New Marsh so it was not analyzed for difference among years.

The highest numbers of nests were located in shrub communities with over 41% shrub cover. Sweet gale, grass, and moss were the predominant vegetation types at the nest. Average shrub height at the nest was 100 cm with about 40% shrub cover. Nest sites were most commonly located in inter-levee basins, levees, and natural islands.

***Evaluation:*** Nest initiation normally peaks around the first week in May and then trails off (Bromley 1984). Nest searches and aerial surveys are designed to coincide with this peak. Most geese were just starting incubation by the time searches started, making nests easier to find.

Interestingly, the Medium density plots which produced extremely low nest numbers in 2004 rebounded in 2007 to its average density. However since the sample size was so small in both years (3 plots and 4 plots), no significant difference in density was detected. Because the sampling design is completely random, and the Medium density stratum comprises the smallest area on the delta, we may have trouble detecting changes in this stratum because it will usually have the lowest number of selected plots.

Data collected from this project are used in conjunction with aerial surveys to estimate the dusky Canada goose population. Ground data are used to estimate the number of birds missed in aerial surveys, and thereby improve aerial estimation. Conditions and timing of nest searching in FY2007 were excellent, and an accurate assessment of nesting activity was obtained.

***Recommendations of remedial action*:** None

***Actions taken in response to recommendations in previous reports:*** None

***Other Recommendations:*** It is still recommended to continue to conduct the nest searches to augment the aerial surveys for several reasons. Studies to appraise the status of the dusky nesting population began as early as 1952 (Nelson 1952, Olson 1954). In 1964, the ADF&G initiated nest surveys to document habitat use, nest density, and success (Shepherd 1965). They standardized methods and conducted annual nest surveys on high nest density areas from 1982 to 1992 (Campbell and Timm 1983, Campbell 1990, Campbell, Rosenberg, and Rothe 1992). These data provide long-term indices of nest density, fate, and type of depredation, but focus only on higher density areas. Nest surveys on random plots were needed to extrapolate these types of data to the entire breeding population. In addition, the Delta continues to undergo plant community succession accelerated by the 1964 Earthquake (Crow 1968, Potyondy et al. 1975, Kempka et al. 1994, Thilenius 1995, Boggs 2000), and areas of high nest density are likely to shift.

In 1979, ADF&G initiated fixed-wing aerial surveys over part of the Delta to provide an index to the distribution and numbers of nesting geese. Since 1983, this annual survey has been continued by the USFWS (Conant and Dau 1990, Butler and Eldridge 1991, Eldridge and Platte 1995). In 1986, the survey was refined, intensified, and expanded to include all known or suspected nesting habitats on the Delta (Butler and Eldridge 1991). In addition, fixed-winged surveys were compared to helicopter surveys. The results suggested that geese were being missed by either method, and in order to get a population estimate, a ground-based correction was needed. Due to the fact that vegetation is changing, this correction factor is repeated every three years.

After current protocols are revised and approved, the evaluation and recommendation presented here will be reviewed and reconsidered.

**What are the population trends for moose and the relationship to habitat?**

- Frequency of Collection: Annual
- Frequency of Evaluation: Annual
- Status in FY2007: Not monitored or evaluated[1]

**What are the population trends for black oystercatchers and the relationship to habitat *change*?** (The question was revised in 2006 from "What are the population trends for black oystercatchers and the relationship to habitat?")

- Frequency of Collection: 3 years of each 5 year period
- Frequency of Evaluation: Every 5th year
- Status in FY2007: Not monitored or evaluated in FY2007. This question was monitored and evaluation in FY2006 so was not scheduled for FY2007. (protocol being developed)

***Actions taken in response to recommendations in previous reports:*** None

***Other Recommendations:*** The MEIT reinterpreted general monitoring questions from the Revised Forest Plan when they were not clearly stated as a Forest Plan monitoring question. Based on the information presented for this question in Table 5-1 of the Forest Plan, MEIT rephrased it to "What are the population trends for black oystercatchers and the relationship to habitat *change*?" In 2006, FLT decided to revise monitoring question to reflect MEIT interpretation and the question now reflects that revision.

**What are the population trends for Dolly Varden char and the relationship to habitat?**

- Frequency of Collection: Annual
- Frequency of Evaluation: Every 5th year
- Status in FY2007: Not monitored or evaluated (protocol being developed)

**What are the population trends for Coho salmon and the relationship to habitat?**

- Frequency of Collection: Annual
- Frequency of Evaluation: Every 5th year
- Status in FY2007: Not monitored or evaluated[1] (protocol being developed)

## Species of Special Interest

**Is Forest management maintaining favorable conditions for sustaining gray wolves?**

- Frequency of Collection: Annual
- Frequency of Evaluation: Every 5th year
- Status in FY2007: Not monitored or evaluated (not funded)

**Is Forest management maintaining favorable conditions for sustaining Kenai wolverines?**

- Frequency of Collection: Annual

- Frequency of Evaluation: Every 5th year
- Status in FY2007: Not monitored or evaluated (not funded)

**Is Forest management maintaining favorable conditions for sustaining Townsend warblers?**

- Frequency of Collection: Every 5th year
- Frequency of Evaluation: Every 5th year
- Status in FY2007: Not monitored (not funded)

**Is Forest management maintaining favorable conditions for sustaining northern goshawks?**

- Frequency of Collection: Annual
- Frequency of Evaluation: Every 5th year
- Status in FY2007: Not monitored (not funded)

**Is Forest management maintaining favorable conditions for sustaining Sitka black-tailed deer?**

- Frequency of Collection: Annual
- Frequency of Evaluation: Every 5th year
- Status in FY2007: Not monitored (not funded)

**Is Forest management maintaining favorable conditions for sustaining the Montague Island marmot?**

- Frequency of Collection: 1 time
- Frequency of Evaluation: Every 5th year (if marmot are found to be present, adjustments will be made to the schedule)
- Status in FY2007: Not monitored or evaluated to date (not funded)

**Is Forest management maintaining favorable conditions for sustaining cutthroat trout?**

- Frequency of Collection: Annual
- Frequency of Evaluation: Every 5th year
- Status in FY2007: Not monitored (not funded)

## Sensitive Animal Species

**What are the population trends for trumpeter swans and the relationship to habitat change?** (The question was revised in FY2007 from "What are the status and trends of trumpeter swans?")

- Frequency of Collection: Annual
- Frequency of Evaluation: Every 5th year
- Status in FY2007: Not monitored or evaluated (not funded)

***Actions taken in response to recommendations in previous reports:***
None

***Other Recommendations:*** The MEIT reinterpreted general monitoring questions from the Revised Forest Plan when they were not clearly stated as a Forest Plan monitoring question. Based on the information presented for this question in Table 5-1 of the Forest Plan, MEIT rephrased it to "What are the population trends for trumpeter swans and the relationship to habitat *change*?" In FY2007, it was decided to revise the monitoring question to reflect the MEIT interpretation.

## Forest Products

**Are forestlands restocked?**

- Frequency of Collection: Annual sample of selected areas
- Frequency of Evaluation: Annual
- Status in FY2007: Not monitored or evaluated (protocol approved)

**Have conditions changed that would affect the suitability of timber production lands?**

- Frequency of Collection: Every 10 years
- Frequency of Evaluation: Every 10 years
- Status in FY2007: Not monitored or evaluated (protocol approved)

## Minerals

**Are mining plans of operations consistent with Revised Forest Plan direction?**

Note: In FY2007, this item was determined to be an inventory to be completed in 2008 and be dropped from the monitoring plan.

- Frequency of Collection: One time
- Frequency of Evaluation: At year 5
- Status in FY2007: Not monitored. Question proposed to be removed from monitoring strategy.

## Heritage Resources

**Are National Register eligible heritage resources being adequately maintained and protected?**

- Frequency of Collection: Annual
- Frequency of Evaluation: Annual
- Status in FY2007: Not monitored or evaluated (protocol being developed)

**What is the status and condition of heritage resources on the Forest?**

- Frequency of Collection: Annual
- Frequency of Evaluation: Annual
- Status in FY2007: Not monitored or evaluated (protocol being developed)

## Recreation Opportunities, Tourism, Access, and Facilities

**What are the characteristics of recreational visitors? What is their pattern of recreational use? What are their perceptions of opportunities and settings?**

- Frequency of Collection: Once every 5 years
- Frequency of Evaluation: Every 5th year
- Status in FY2007: Monitored in 2003 (not evaluated)

**Is the Revised Forest Plan direction for motorized and non-motorized access working?**

- Frequency of Collection: Annual
- Frequency of Evaluation: Every 5th year
- Status in FY2007: Not monitored or evaluated (protocol completed, but not approved)

**Are areas of the Forest being managed in accordance with the prescribed Recreation Opportunity Spectrum (ROS) class in Forest-wide standards and guidelines?**

- Frequency of Collection: Annual
- Frequency of Evaluation: 5 years
- Status in FY2007: Not monitored (not funded)

**What is the use of developed recreational facilities and how does it compare to capacity?**

- Frequency of Collection: Annual
- Frequency of Evaluation: Annual
- Status in FY2007: Not monitored (protocol completed, but not approved)

**What are the trends in commercial recreation services on the Forest and how does it compare to capacity?**

- Frequency of Collection: Annual
- Frequency of Evaluation: Every 5th year
- Status in FY2007: Not monitored (protocol completed, but not approved)

## Scenic Quality

**Are areas of the Forest being managed in accordance with the Scenery Integrity Objectives (SIO) in Forest-wide Standards and Guidelines?**

- Frequency of Collection: Annual sample of selected areas
- Frequency of Evaluation: Every 5th year
- Status in FY2007: Not monitored or evaluated (protocol being developed)

## Fire Protection and Fuels Management

**What is the pattern of abundance of different fuel types on the Kenai Peninsula?**

- Frequency of Collection: Once every 5 years
- Frequency of Evaluation: Every 5th year
- Status in FY2007: Not monitored or evaluated (protocol being developed)

## Wilderness

**Is the wilderness character of the Wilderness Study Area (WSA) and areas recommended for Wilderness being maintained?**

- Frequency of Collection: Annual sample of selected areas
- Frequency of Evaluation: Every 5th year
- Status in FY2007: Not monitored or evaluated (protocol being developed)

## Research Natural Areas

**Are proposed and established Research Natural Areas (RNA) being maintained in a state unmodified by human activity?**

- Frequency of Collection: Once in 10 years
- Frequency of Evaluation: Every 10th year
- Status in FY2007: Not monitored (protocol completed in FY2007, not approved)

## Community Effects

**What are the trends in local economies?**

- Frequency of Collection: Annual
- Frequency of Evaluation: Every 3rd year
- Status in FY2007: Not monitored, no evaluation to date (not funded)

**What are the effects of National Forest management on lands, resources and communities adjacent to the Forest?**

- Frequency of Collection: Once every 5 years
- Frequency of Evaluation: Every 5th year
- Status in FY2007: Not monitored or evaluated (not funded)

## Additional Questions

**What are the population trends for mountain goat and the relationship to habitat *change*?** (In FY2007 FLT decided to revise the question to include the word “change”.)

Note: This general question was added to comply with the 1982 planning regulations regarding MIS (36 CFR 219.19), and to meet the intent of the general MIS monitoring question on page 5-8 of the Forest Plan (also listed on page 5 of this report). The mountain goat is an MIS on Chugach

National Forest, and therefore, population and habitat trends are subject to monitoring.

- Frequency of Collection: Annual
- Frequency of Evaluation: Every 3rd year (not done yet)
- Status in FY2007: Not monitored or evaluated (protocol being developed)

***Evaluation:*** None in FY2007

***Recommendations of remedial action*:** None

***Actions taken in response to recommendations in previous reports**:* None

***Other Recommendations:*** The MEIT reinterpreted general monitoring questions from the Revised Forest Plan when they were not clearly stated as a Forest Plan monitoring question. Based on the information presented for this question in Table 5-1 of the Forest Plan, MEIT rephrased it to "What are the population trends for mountain goats and the relationship to habitat *change*?" In FY2007 FLT decided to change the monitoring question to reflect the MEIT interpretation.

**Are Forest management actions contributing to changes in air quality on the Forest?**

Note: This general question was added in response to the Revised Forest Plan appeal decision.

- Frequency of collection: Annual, in FY2007 revised to every 3-5 years.
- Frequency of evaluation: Annual, in FY2007 revised to every 3-5 years.
- Status in FY2007: Monitored and evaluated. Protocol was approved and the frequency of monitoring and evaluation was revised to every 3-5 years.

An air quality monitoring pilot study was conducted on the Chugach National Forest during the winter of 2006-2007 to address concerns that winter motorized uses on the Forest are impacting air quality. The purpose was to quantify the levels of air pollutants in areas with high levels of winter motorized use on the Chugach National Forest. The air quality monitoring protocol was developed as part of the Forest Plan Monitoring Guide, and the protocol was implemented from January 2007 to May 2007. Technical assistance was provided by the Alaska Department of Environmental Conservation. (MacFarlane 2007)

Forest Service personnel from the Supervisor's Office and the Glacier Ranger District measured carbon monoxide and fine particulate concentrations at Turnagain Pass on a total of 8 weekend days during the winter-motorized season of FY2007. The west side of Turnagain Pass

represents one of the most heavily used areas on the Chugach National Forest for winter motorized use. Weather and use parameters were also measured during these sample days. The data were analyzed in relation to use levels and weather conditions, and a report was produced. The complete *"Winter 2007 Air Quality Monitoring Report, Turnagain Pass, Alaska, Chugach National Forest"* prepared by Bill MacFarlane is available at the Forest Supervisor's Office in Anchorage Alaska.

***Evaluation:*** The data show that motorized use at Turnagain Pass resulted in increased levels of carbon monoxide and fine particulates at sites measured near the western parking lot. However, the carbon monoxide and fine particulate data collected on the 8 sample days indicated no violations of the Alaska State air quality standards. Under the present motorized use trends at Turnagain Pass, the likelihood of exceeding the standards as a result of winter motorized use is relatively low. However, as shown on one of the sample days, a moderate potential exists for exceeding the standards when high levels of motorized use occur on cold days with temperature inversions. (MacFarlane 2007)

***Recommendations of remedial action for this monitoring item*:** None

***Actions taken in response to recommendations in previous reports:*** None

***Other Recommendations:*** This study was limited in its temporal and spatial scope, but provides an adequate look at the potential that these uses are violating State air quality standards. It is recommended that this type of sampling is repeated every 3 to 5 years to determine future trends and whether violations of air quality standards are occurring. (MacFarlane 2007)

Fine particulates should be measured, as they are the largest concern for violations of the State standards from winter motorized use. From a technical standpoint, the "EBAM" sampler with a battery system performed well for this type of sampling. Carbon monoxide may also be measured. However, the "PACIII" samplers did not perform well in this environment. If carbon monoxide is measured, alternate sampling equipment may need to be acquired and tested. Chugach National Forest personnel should work with the Alaska Department of Environmental Conservation to conduct this sampling. Sampling should be conducted in high-use areas such as Turnagain Pass, the Lost Lake trailhead, or the Placer River parking areas. Because of the remote nature of these sites and the low potential for exceeding the State air quality standards at this time, it is not feasible to install permanent air quality monitoring equipment. Sampling should focus on cold days with temperature inversions and high levels of use in

order to measure the maximum levels of air pollutants that might occur under these conditions. (MacFarlane 2007)

**What is the effect of summer OHV use on soils and/or vegetation where OHV use is allowed?**

Note: This general question was added in response to the Revised Forest Plan Appeal Decision.

- Frequency of collection: Not defined
- Frequency of evaluation: Not defined
- Status in FY2007: Monitored on Cordova Ranger District (protocol not complete)

In FY2007, the Cordova Ranger District continued to monitor off-highway vehicle (OHV) use on portions of Hawkins and Hinchinbrook Island based on recommendations in the 2006 monitoring report (Hodges 2006; Meade 2007). Following is a summary of the FY2007 report.

The areas monitored are open to OHV use by rural Alaska residents for subsistence purposes (generally for deer hunting from Aug.1 – Dec. 31) in both summer and winter. Areas can be closed if natural resources are significantly impacted by OHV use. For non-subsistence uses, the following restrictions apply: 1) the Anderson Bay area is open to summer OHV use on designated routes and in all areas for winter use - no routes have been designated at this time, and 2) the Canoe Pass area is closed to motorized use.

Approximately 10 miles of OHV trail systems were surveyed in FY2007. Trails surveyed were located in Anderson Bay on Hinchinbrook Island and in the Canoe Pass area on Hawkins Island. Trail data, maps, and photos for each system are presented in the FY2007 report prepared by Meade.

***Evaluation:*** Generally, the trails had relatively light damage, with most of the disturbances in the Level 0 and Level 1 categories (refer to Meade for detailed descriptions of each level). At these levels the soil is not exposed, and the disturbance to the vegetation might be expected to heal within a year or so. Other areas were more heavily impacted by the concentration of use in small areas or vehicle traffic in more sensitive parts of wetland areas. These trails generally are located in wetland areas running along the edges of meadows, skirting thicker forested areas.

The effect on streams is limited because most of the stream crossings are on small Class 4 streams that have little flow and are incapable of transporting sediment. The damage to these streams is limited to the banks and vegetation at the trail crossing site. Only a few fish-bearing streams have been affected.

Anderson Bay, Hinchinbrook Island

The two trails surveyed in the Anderson Bay area were the Anderson Creek and Eagle Creek trails. In FY2007 crews walked the trails identified in 2006 and focused on the impacted areas noted in the 2006 report. There was no recent use on either of these trails at the time of the survey on August 29, 2007.

Crews observed very few impacts from OHV use on the 1.6 miles of the Anderson Creek Trail. The trail was intermittent indicating that vegetation had recovered from past use. Impacts were limited to a section less than 0.25 mile long near the beginning of the route above the estuary. The impacts consisted of relatively minor tracks in the vegetation in the meadows and ruts no more than 3 inches deep. These impacts were similar to those reported in 2006. This area may take longer to recover simply because of the moisture levels in the soils.

Little OHV disturbance on the 2.2 miles of the Eagle Creek Trail was observed. In 2006 it was reported that about half of the trail had Level 2 disturbances consisting of vegetation loss and minor ruts. The rest were Level 3 disturbances with more soil destruction and erosion and ruts up to 3.5 inches deep. In FY2007 it was difficult for crews to follow the trail, indicating no recent use and that the vegetation was recovering. A short section of trail on the slope of a small hill still showed some bare soil in the areas reported to have Level 3 disturbances in 2006.

Canoe Pass, Hawkins Island

The 3 trails in the Canoe Pass area of Hawkins Island surveyed on August 28, 2007 were the Canoe Pass Main Trail, the Canoe Pass Half-Mile-One Trail, and the Canoe Pass Half-Mile-Two Trail. Recent OHV use was evident on the Main and Half-Mile-Two Trails.

The Canoe Pass Main Trail is approximately 4.0 miles long, and although it has the most disturbances from OHV use of all the trails surveyed, the damage was relatively limited. The more heavily damaged areas where the soil structure was destroyed (generally deeper ruts and mud holes) comprised 11% of the trail in 2006. The depths of the ruts ranged from 4-12 inches deep. In FY2007 the disturbance from recent use was isolated to the same locations noted in 2006 and indicates problem areas where rehabilitation may need to take place.

The Canoe Pass Half-Mile-One Trail consists of two paths crossing a muskeg wetland before joining the Half-Mile-Two Trail. The 2.1 miles of trail appear to be lightly used, and the trailhead may simply be an alternate landing area for boats carrying the OHVs when the tide is too low to access the trailhead of Half-Mile-Two Trail. In FY2007 no recent use on the trail was observed.

The 2.2 miles of the Canoe Pass Half-Mile-Two-Trail are relatively less impacted than other trails, but some disturbances were recorded. According to the 2006 survey, 8.4% of the trail had Level 3 or 4 disturbances with soil erosion. The ruts are not particularly deep compared to sites on the Canoe Pass Main Trail, although one Level 3b site had ruts nearly 7 inches deep. The stream crossing generally have high levels of bank and channel damage, but 10 of 12 crossings are at Class 4 streams, so the erosion potential and effects to fish habitat are minimal. Juvenile coho salmon and Dolly Varden were trapped in one Class 3 stream and one Class 1 stream (crossing 8) in 2006.

At the time of the survey in August FY2007 recent activity was noted on this trail and disturbances were in the same areas and at the same levels as noted in the 2006 survey.

***Recommendations for remedial action for this monitoring item*:** Since the Canoe Pass trails are relatively close to Cordova, several private cabins are in the area, and the Canoe Pass inlet provides a sheltered anchorage for boats, these trails probably receive relatively high OHV use. Although large sections of these trails are undamaged, disturbances in some sections of the trail may have become worse since the 2002 surveys. In FY2007, recent use was evident on both of these trails.

The field notes speculated that some areas may have revegetated since use during the previous year, but some sections have not yet recovered from the damage. Trail damage appears to be worse where the OHV traffic is funneled toward small gaps in the forested stringers. It is possible that these sites and perhaps some of the stream crossings are the only practical routes in the area, so the continued heavy use does not allow recovery.

OHV users on the Canoe Pass trails have tried to minimize damage by placing logs, culverts, boards, or other materials at most of the stream crossings and on some of the steeper slopes. These efforts have probably helped, but haven't been entirely successful. If continued monitoring shows that damage is increasing, specific stringer or stream crossing sites may need to be closed, alternate routes created, damaged areas restored, or hardened paths created. Placing log stringers or some other material through wetter areas and reseeding bare soil is recommended. Some of the crossings at fish-bearing or Class 3 streams may need immediate restoration work to prevent damage to fish habitat.

***Actions taken in response to recommendations in previous reports:*** One of the questions to be addressed with this monitoring is the current status of the effects of OHV use in the Anderson Bay area. It was a big

concern since the area had heavy OHV use that caused resource damage in the past. The low amounts of resource damage observed in the 2006 and FY2007 monitoring efforts indicate little or no OHV use is occurring in this area now. It appears that some of the damaged areas noted in 2002 may have recovered naturally.

***Other Recommendations:*** The 2006 surveys provided a good database on the location and extent of soil and vegetation damage caused by OHV use. No invasive plant species were found during the surveys in 2006 or FY2007. Invasive plants are often a concern associated with OHV use because seeds or plant parts often stick in the mud on the tires and are transported to new sites.

The main knowledge gap is what the current use is and to what degree the damage is accruing over time. It is possible that the use at Anderson Bay is low enough that the disturbed trail sections can recover naturally. In this case it may not be necessary to restore Level 3 disturbances until we know that continuing use or other factors will not permit natural recovery. At stream crossing sites and areas where damage is increasing, a response may be necessary.

Little information exists on how fast the vegetation recovers from OHV damage and the implications of relocating trails. If recovery times are reasonably short, trails could be moved to other routes while damaged areas are “rested” and allowed to revegetate. The trails could be switched back before the alternate route is severely damaged. It would appear that the rates of damage and recovery are dependent on the site specific conditions – basically how wet the soil is and how steep the slope. Relocating the trails would require some effort to find new routes where damage is least likely to occur.

In areas where it is not possible to relocate a trail, trail hardening or structures may be needed. It may be possible to use local native materials, such as logs, to make bridges, corduroy paths, or other structures. For extensively damaged areas, geotextile fabric overlain with gravel, Geoblock®, or other materials may need to be used. The cost of planning, construction, and materials could be substantial if a hardened trail is needed to cover long stretches of wetlands.

Examples of mitigation include limiting OHV use when the ground is not frozen, avoiding use in the wetter areas, or agreeing to end trails at designated sites in the back country and to continue hunting on foot beyond that point.

After current protocols are revised and approved, the evaluation and recommendation presented here will be reviewed and reconsidered.

## STATUS OF FOREST PLAN MONITORING BY FISCAL YEAR

**Status of Forest Plan monitoring; frequency of data collection and evaluation.**
No = not monitored; Yes= monitored; OA = monitored by other agencies; P-Dev = protocol being developed; N/A = not applicable. Cells are highlighted in FY evaluation should occur.

| # | Monitoring Question (How often data collected) | How often evaluated | FY03 | FY04 | FY05 | FY06 | FY07 |
|---|---|---|---|---|---|---|---|
| **Compliance with Revised Forest Plan Direction** | | | | | | | |
| 1 | Are projects being implemented consistent with the Forest Plan direction? **(5 years)** | Every 5 yrs | N/A | N/A | N/A | No P-Dev | No P-Dev |
| **Integrated Effectiveness/Validation Monitoring** | | | | | | | |
| 2 | Are management activities achieving their intended outcomes? **(Annual)** | Every 5 yrs | No – P-Dev | No – P-Dev | No P-Dev | No P-Dev | No – Protocol on hold in 07 |
| 3 | To what extent is ecosystem composition and structure changing and has forest management influenced these changes? How do these changes compare to the expected range? **(Annual)** | Every 5 years | Yes – Report | Yes - Report | No | No P-Dev | No P-Dev |
| **Soil Resources** | | | | | | | |
| 4 | What is the level of ground disturbing activity? **(Annual)** | Every 5 years | Yes Report | No | No | No P-Dev | No P-Dev |
| **Water Resources** | | | | | | | |
| 5 | What is the existing water quantity? **(As scheduled)** *In 07, FLT decided this was research, not FP monitoring* | Every 5 years | Yes Report | No | No | No P-Dev | None will occur |
| 6 | Are Best Management Practices (including wetland management) effective in meeting water quality standards? **(As scheduled)** | Every 5 years | No | No | No | No P-Dev | No P-Dev |
| **Sensitive and Exotic Plant Species** | | | | | | | |
| 7 | What is the abundance and distribution of sensitive plants in areas affected by management activities? **(Annual)** *As of 2007, done on a project- by-project basis, (TE&S surveys) no forest-wide report or evaluation.* | Every 5 years | No | No | No | No P-Dev | No P-Dev |

**Status of Forest Plan monitoring; frequency of data collection and evaluation.**
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| # | Monitoring Question (How often data collected) | How often evaluated | FY03 | FY04 | FY05 | FY06 | FY07 |
|---|---|---|---|---|---|---|---|
| 8 | What is the distribution and abundance of exotic plants, particularly in areas affected by management activities? **(Annual)** *As of 2007, done on a project- by-project basis, (TE&S surveys) no forest-wide report or evaluation.* | Annual | No | No | No | No<br>P-Dev | No<br>P-Dev |
| **Management Indicator Species** | | | | | | | |
| 9 | What are the population trends for Management Indicator Species (MIS) and their relationship to habitat? Are MIS truly reflective of all fish and wildlife species on the Forest? **(not shown)** **In FY06, FLT decided question is redundant with specific MIS monitoring questions*. | Not shown | No | No | No | No – not funded | Dropped |
| 10 | Has the Revised Forest Plan direction prevented adverse interactions between bears and humans? **(Annual)** | Every 5 years | | | | No<br>P - Dev | No<br>P-Dev |
| 11 | What are the population trends for brown bear and the relationship to habitat? **(Every 3rd year)** | Every 3 years | N/A | No | Report | Status Report; No evaluation; Monitored by OA | No - OA |
| 12 | What are the population trends for dusky Canada geese and the relationship to habitat change? **(Every 3rd year)** | Every 3 years | | Report | No | No – OA, no FS funding | Yes<br>(OA + FS) |
| 13 | What are the population trends for moose and the relationship to habitat? **(Annual)** | Annual | | | 2 Survey Reports | No - OA | No - OA |
| 14 | What are the population trends for black oystercatchers and the relationship to habitat change? **(3 yrs in each 5 yrs)** | Every 5 years | Yes - Survey & Report | Yes - Report | Yes - Report | Yes, *report did not address Forest Plan question.* | No<br>P- Dev |
| 15 | What are the population trends for Dolly Varden char and the relationship to habitat? **(Annual)** | Every 5 years | Yes - Report | Yes - Report | | No<br>P- Dev | No<br>P- Dev |

**Status of Forest Plan monitoring; frequency of data collection and evaluation.**

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| # | Monitoring Question (How often data collected) | How often evaluated | FY03 | FY04 | FY05 | FY06 | FY07 |
|---|---|---|---|---|---|---|---|
| 16 | What are the population trends for coho salmon and the relationship to habitat? **(Annual)** | Every 5 years | No | Yes Report | No | No P- Dev | No P- Dev |
| **Species of Special Interest** | | | | | | | |
| 17 | Is Forest management maintaining favorable conditions for sustaining gray wolves? **(Annual)** | Every 5 years | No | No | No | No - Not funded | No - not funded |
| 18 | Is Forest management maintaining favorable conditions for sustaining Kenai wolverines? **(Annual)** | Every 5 years | No | Report | No | No - Not funded | No - not funded |
| 19 | Is Forest management maintaining favorable conditions for sustaining Townsend warblers? **(Every 5 years)** | Every 5 years | N/A | N/A | N/A | No - Not funded | No - not funded |
| 20 | Is forest management maintaining favorable conditions for sustaining northern goshawks? **(Annual)** | Every 5 years | No | No | No | No - Not funded | No - not funded |
| 21 | Is Forest management maintaining favorable conditions for sustaining Sitka black-tailed deer? **(Annual)** | Every 5 years | No | No | No | No- Not funded | No – not funded |
| 22 | Is forest management maintaining favorable conditions for sustaining the Montague Island marmot? **(1 time)** | Every 5 years | No | No | No | No - Not funded | No – not funded |
| 23 | Is Forest management maintaining favorable conditions for sustaining cutthroat trout? **(Annual)** | Every 5 years | 2 Reports | Report | No | No - Not funded | No - not funded |
| **Sensitive Animal Species** | | | | | | | |
| 24 | What are the population trends for trumpeter swans and the relationship to habitat change? **(Annual)** | Every 5 years` | Yes - Report | Yes - Report | Yes - Report | Yes on Kenai | No – not funded |
| **Forest Products** | | | | | | | |
| 25 | Are harvested forestlands restocked? **(annual of selected areas)** | Every 5 years | No | No | No | No P-Dev | No Protocol approved |

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|---|---|---|---|---|---|---|---|
| **#** | **Monitoring Question (How often data collected)** | **How often evaluated** | **FY03** | **FY04** | **FY05** | **FY06** | **FY07** |
| 26 | Have conditions changed that would affect the suitability of timber production lands? **(every 10 years)** | Every 10 years | No | No | No | No P-Dev | No Protocol approved. |
| **Minerals** | | | | | | | |
| 27 | Are mining plans of operations consistent with Revised Forest Plan direction? **(once)** *In FY2007 determined to be an inventory to occur in FY08.* | Every 5 years | No | No | No | No P-Dev | No - inventory so no protocol needed. |
| **Heritage Resources** | | | | | | | |
| 28 | Are National Register eligible heritage resources being adequately maintained and protected? **(Annual)** | Annual | No | No | No | No P-Dev | No P-Dev |
| 29 | What is the status and condition of heritage resources on the Forest? **(Annual)** | Annual | No | No | No | No P-Dev | No P-Dev |
| **Recreation Opportunities, Tourism, Access, and Facilities** | | | | | | | |
| 30 | What are the characteristics of recreational visitors? What is their pattern of recreational use? What are their perceptions of opportunities and settings? **(Once every 5 years)** | Every 5 years | Yes - Survey & Report | No | Report | No | No |
| 31 | Is the Revised Forest Plan direction for motorized and nonmotorized access working? **(Annual)** | Every 5 years | No | No | No | No P-Dev | No Protocol needs FLT approval |
| 32 | Are areas of the Forest being managed in accordance with the prescribed Recreation Opportunity Spectrum (ROS) class in Forest-wide standards and guidelines? **(Annual)** | Every 5 years | No | No | No | No – Not funded | No – not funded |
| 33 | What is the use of developed recreational facilities and how does it compare to capacity? **(Annual)** | Annual | No | No | No | No P-Dev | No Protocol needs FLT approval |

**Status of Forest Plan monitoring; frequency of data collection and evaluation.**
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| # | Monitoring Question (How often data collected) | How often evaluated | FY03 | FY04 | FY05 | FY06 | FY07 |
|---|---|---|---|---|---|---|---|
| 34 | What are the trends in commercial recreation services on the Forest and how does it compare to capacity? **(Annual)** | Annual | No | No | No | No P-Dev | No Protocol needs FLT approval |
| **Scenic Quality** | | | | | | | |
| 35 | Are areas of the Forest being managed in accordance with the Scenery Integrity Objectives in Forest-wide standards and guidelines? (**annual sample of selected areas)** | Every 5 years | No | No | No | No P-Dev | No P-Dev |
| **Fire Protection and Fuels Management** | | | | | | | |
| 36 | What is the pattern of abundance of different fuel types on the Kenai Peninsula? **(once every 5 years)** | Every 5 years | N/A | N/A | N/A | No P-Dev | No P-Dev |
| **Wilderness** | | | | | | | |
| 37 | Is the wilderness character of the Wilderness Study Area (WSA) and areas recommended for Wilderness being maintained? **(Annual sample for selected areas**) | Every 5 years | No | No | No | No P-Dev | No P-Dev |
| **Research Natural Areas** | | | | | | | |
| 38 | Are proposed and established Research Natural Areas (RNA) being maintained in a state unmodified by human activity? **(Once every 10 years)** | Every 10 years | N/A | N/A | N/A | No P-Dev | No P-Dev |
| **Community Effects** | | | | | | | |
| 39 | What are the trends in local economies? **(annual)** | Every 3 years | No | No | No | No – not funded | No – not funded |
| 40 | What are the effects of National Forest management on lands, resources and communities adjacent to the Forest? **(Once every 5 years)** | Every 5 years | N/A | N/A | N/A | No – N/A | No – not funded |

| **Status of Forest Plan monitoring; frequency of data collection and evaluation.** No = not monitored; Yes= monitored; OA = monitored by other agencies; P-Dev = protocol being developed; N/A = not applicable. Cells are highlighted in FY evaluation should occur. | | | | | | | |
|---|---|---|---|---|---|---|---|
| **#** | **Monitoring Question (How often data collected)** | **How often evaluated** | **FY03** | **FY04** | **FY05** | **FY06** | **FY07** |
| **Question added through Record of Decision** | | | | | | | |
| 41 | What are the population trends for mountain goat and the relationship to habitat change?**(Annual)** | Every 3 years | Yes - CRD | Yes - CRD | Yes – CRD - not evaluated | Yes – CRD P - Dev | No P-Dev |
| **Appeal Decision generated questions** | | | | | | | |
| 42 | Air Quality - Are Forest management actions contributing to changes in air quality on the Forest? **(annual – in FY2007 changed to every 3-5 years)** | Annual (in FY2007, changed to every 3-5 years) | No | No | No | No P- Dev | Yes |
| 43 | OHV Impacts - What is the effect of summer OHV use on soils and/or vegetation where OHV use is allowed? **(not defined)** | Not Defined | No | No | No | Yes – on CRD | Yes – on CRD P-Dev |

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