



# Fiscal Year 2014 Tongass National Forest



Photo: Rainbow over Misty Fiords

## Annual Monitoring and Evaluation Report Summary

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## Monitoring Overview

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The 2014 Annual Monitoring and Evaluation Report summarizes specific monitoring completed during fiscal year (FY) 2014 in accordance with the Tongass Land and Resource Management Plan (Forest Plan). Chapter 6 of the Forest Plan specifies an annual written summary of forest-wide monitoring programs.

Some monitoring protocols and questions were updated to better define and focus monitoring work during the completion of the 2008 Forest Plan Amendment. This report serves as the annual written summary of forest-wide monitoring program. A five year summary of Forest Plan monitoring was completed in 2012. Changes relative to recommendations in the five year evaluation and a transition to comply with the 2012 Planning rule is ongoing.

Monitoring work is currently underway for most of the questions in this report. Monitoring is completed through years of data collection and evaluation.

A full reference report for each question is available by hyperlinks in this report.

If you have questions or comments about this report, please contact Cathy Tighe at the Ketchikan Forest Supervisor's Office, 907-228-6274.

## Monitoring and Evaluation Program

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Monitoring and evaluation are quality control processes for implementing the Tongass Forest Plan. They provide the public, the Forest Service, and other agencies with information on the progress and results of plan implementation. Monitoring and evaluation comprise an essential feedback mechanism within an adaptive management framework to keep the Plan dynamic and responsive to changing conditions. The evaluation process also provides feedback that can trigger corrective action, adjustment of plans and budgets, or both, to facilitate action on the ground.

The Forest Supervisor is responsible for coordinating the preparation of the annual monitoring and evaluation report. This report summarizes the monitoring activities and results from FY2014. It addresses and evaluates each of the questions listed in the monitoring plan.

Generally, the annual report focuses on the information gathered during the year and identification of issues requiring immediate attention. A more comprehensive evaluation process takes place every fifth year. The evaluation includes recommendations for remedial action – if necessary – to make management activities and their effects, consistent with the Forest Plan.

# Physical and Biological Environment

## 1. Air Quality

### Is air quality being maintained?

The City of Juneau, Mendenhall Valley area is in maintenance status for PM 10 and PM 2.5 National Ambient Air Quality Standards. The wilderness lichen plots (S. Etolin, Coronation, and Kootznoowoo) that were visited in 2014 assisted in achieving a higher score for the air element in the Chief's 10-Year Wilderness Stewardship Challenge. The 2014 lichen analysis results will be presented in 2015. The consistent monitoring every ten years allows wilderness managers to gather trend data and to be aware of the environmental conditions that represent the wilderness character for air quality. The plots that contain contaminants elevated above threshold will be monitored in 8 to 10 years to determine the trend in concentrations and any effects to the lichen community at those sites.



Collecting lichen tissue for contaminant analysis in South Etolin Wilderness. Photo by Karen Dillman



Lake in S. Etolin Wilderness near where permanent air quality lichen monitoring plots reside.

Photo by Karen Dillman

[Link to Reference Report](#)

## 2. Climate Change

### What are the long-term changes to the permanent snowpack and how does it affect the physical and biological environment?

The Tongass developed a Climate Change Team that is working with EcoAdapt to develop limited climate vulnerability assessments focuses on snow, ice, and water. Glacier and snowpack changes can indicate climate trends that are relevant to national forest management. Changes in glaciers and snowpack alter stream flow, water quality, and habitats important to fish, wildlife, and communities.

This report summarizes new information and ongoing efforts related to climate change, snowpack changes (glaciers, permanent and seasonal snowpack), and streamflow.

Climate change vulnerability assessments and multi-stakeholder collaborations are in progress. These can focus on at risk resources managed by the Tongass.

Monitoring recommendations include maintaining current snow courses and stream gauges and establishing additional monitoring sites in salmon producing watersheds in the southern and outer coastal areas of the Tongass.

[Link to Reference Report](#)

## 3. Biodiversity – Restocked Harvested Forest Lands

### Are harvested forest lands restocked within 5 years after harvest?

The 2008 Forest Plan requires that all harvested stands be restocked within 5 years of timber harvest. All harvested lands were examined following treatment. Typically, natural regeneration occurs on 100 percent of harvested stands. If natural restocking does not occur, artificial regeneration is required, but this has not occurred in the past several decades on the Tongass.

All stands harvested in FY2009 were certified as restocked in FY2014 or an earlier fiscal year. All lands harvested prior to FY2009 have also been certified as re-stocked.



Young Alaska yellow-cedar tree. Photo by Sheila Spores



Fully stocked unit. Photo by Sheila Spores

[Link to Reference Report](#)

## 4. Biodiversity – Young-Growth Habitat

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### Following young-growth treatments, is the change in understory vegetation providing improved habitat for key old-growth associated species?

#### Young-Growth Studies

The Tongass has been working to improve the value of young-growth stands for wildlife and to improve their value for future harvest. This is accomplished using a wide variety of precommercial thinning, and sometimes pruning treatments, under the guidance of the Tongass Young-Growth Management Strategy (USDA 2015). Some of the objectives of this strategy include greater integration in meeting multiple resource needs in managing young-growth and continuing to increase our knowledge of young-growth management treatments through programs such as the Tongass-Wide Young-Growth Studies (TWYGS).

Based on the Forest Service Activity Tracking System (FACTS) database, 5,814 acres of young-growth forest on the Tongass was precommercial thinned in FY2014. Of this, 303 acres were thinned for wildlife habitat. Five acres of openings were also created for wildlife. No slash treatments were done in FY2014. Over the last ten years (2005 – 2014), a total of 57,798 acres have been precommercial thinned on the Tongass, including 4,085 acres with a wildlife emphasis. In that same time period, 680 acres of openings were created for wildlife and 392 acres of slash were treated.

Results of TWYGS from the first 4 to 8 years post-treatment indicate that several thinning prescriptions enhance the value of young-growth stands for deer. However, a long-term understory response to these treatments is still necessary to have an informed thinning program

for wildlife. Thus, continued monitoring is essential.

Initial results suggest that thinning in older young-growth stands provides a delayed understory response.

With the anticipated transition to second growth harvest on the Tongass, our understanding of the understory response to commercial thinning is important. The Prince of Wales Commercial Thinning Study will provide a scientifically credible, replicated, long-term experiment to inform the Tongass transition to harvesting young-growth, including its effects on the value of the understory for deer.

#### Small Mammal Response to Young-Growth Treatments

The availability of small mammals as prey can influence the abundance and distribution of northern goshawk (Salafsky et al. 2005) and marten (Thompson and Colgan 1987; Weckworth and Hawley 1962; Flynn and Schumacher 2009). Small mammals have been shown to respond to forest succession following timber harvest in other parts of the Pacific Northwest with a short-term increase in abundance during the early stages of succession, but declines as the canopy closes (Carey and Wilson 2001; Sullivan and Sullivan 2001; Sullivan et al. 2001; Wilson and Carey 2000; and Yahner et al. 1992). The small mammal response to young-growth study should inform us of the features of the understory in young-growth that small mammal prey need. This information may inform future habitat monitoring in young-growth, should some of these vegetation features not currently be measured in the TWYGS.

[Link to Reference Report](#)

## 5. Biodiversity – Other Habitat Components

### Are young-growth treatments improving other key habitat components for old-growth associated species?

This monitoring question includes assessment of understory species composition to determine if the change in understory vegetation following young-growth treatments provided improved habitat for key old-growth associated species, and if young-growth treatments improved other key habitat components for old-growth associated species. These objectives provided the basis for developing a habitat monitoring protocol for implementation following silvicultural treatments in young-growth forests on the Tongass.

A suggested habitat monitoring protocol has been proposed for addressing this question, but has not been tested or applied in the field, Suring 2011. Preliminary work to develop Graphical Interface tools to establish baseline values for the landscape attributes was planned in FY 2014 but personnel constraints have delayed that work until FY2016. According to the protocol, there will be reports at the start and end of the five year reporting.

#### Terrestrial Fungi in Young-Growth Stands

The protocol is currently being developed to answer this biodiversity question; thus, the evaluation criteria are not yet complete.

Efforts in FY2014 include a contract to continue fungal surveys on Prince of Wales (POW) Island in selected young-growth and old-growth forests. The selected sites contain similar soil type so that comparisons can be made on a broad scale as to the functional groups found in

the young-growth and old-growth stands. This will identify the possibility of fungi being used to determine if old-growth forest associated species are present in young-growth stands.

The goals of the 2014 fungi project on POW are to provide a species list and frequencies of each species found on each unit. Analysis Of Variance tests use frequency data to test the hypotheses of different species composition in old-growth versus young-growth units.

Monitoring will be used to detect patterns and relationships in the species distribution data.

Using macro-fungi to answer this biodiversity question proposes to improve soil productivity interpretations through a better understanding of fungal occurrence in different soil types, vegetation, and successional stages across the Forest. Understanding the factors influencing fungal occurrence will inform soil restoration efforts and young-growth productivity dynamics.



Mycologist surveying at Stoney Creek.  
Photo by Karen Dillman

[Link to Reference Report](#)

## 6. Insects and Disease

### Are destructive insects and disease organisms increasing to potentially damaging levels following management activities?

Management activities do not appear to be exacerbating insect and disease problems on the Tongass. Hemlock dwarf mistletoe and many stem decay pathogens are less frequent after treatment. Yellow-cedar decline in young-growth, hemlock canker, and shoot diseases are issues to watch for in young, managed stands. Stem decays may become prevalent in managed stands as they age due to bole wounding caused by partial harvest or commercial thinning. It is possible to promote or maintain stem decays and mistletoe in stands managed for non-timber objectives in order to enhance habitat, ecological processes, and other old-growth characteristics.

Yellow-cedar decline is a leading example of the impacts of changing climate on a tree species. Management can favor yellow-cedar on sites with deeper soils or sufficient snowpack to meet conservation goals. Prospects for the salvage of dead yellow-cedar are promising in some areas with concentrated

yellow-cedar snags, road access, and land-use designations that permit harvest or salvage. The completed draft yellow-cedar strategy provides guidance yellow-cedar management in Alaska.

The Early Detection Rapid Response program monitors several invasive insects that threaten Alaskan Forests.

Although insect and diseases are not currently causing significant problems in managed stands, we must remain vigilant. The monitoring work conducted annually by the State and Private Forestry branch of the Forest Service, Forest Health Protection group, and Tongass National Forest Silvicultural staff is sufficient to assess threats and impacts from insects and disease.

#### Inchworm. Photo by Sheila Spores



[Link to Reference Report](#)

## 7. Invasive Species – Status and Trends

### What are the status and trends of areas infested by aquatic and terrestrial invasive species relative to the desired condition?

In 2014, no monitoring for invasive animal species was conducted on the Tongass. No occurrences of Atlantic salmon were detected in the waters of the Tongass by ADF&G or the Forest Service. According to ADF&G, European green crab have not yet been detected in Southeast Alaska waters, but monitoring

efforts in 2014 were limited to areas around the cities of Ketchikan, Sitka, and Juneau. ADF&G reports that invasive marine tunicates have been detected in marine harbors in Ketchikan and Sitka.

Seven high-risk invasive plant sites were visited across the Forest in 2014, with infestations covering a total of 2.72 acres. High-priority invasive plant species recorded include brittlestem hempnettle (*Galeopsis tetrahit*), field mustard (*Brassica rapa*), oxeye daisy (*Leucanthemum vulgare*), reed canarygrass (*Phalaris arundinacea*), white clover (*Melilotus*

*alba*), black bindweed (*Polygonum convolvulus*), orange hawkweed (*Hieracium aurantiacum*), and field sowthistle (*Sonchus arvensis*). All seven sites had one or more infestations of invasive plant species that are a high priority for control on the Tongass National Forest.

The high-risk sites visited in 2014 will be revisited at least once during the five-year monitoring cycle, and the new data collected will be compared to the initial monitoring data to determine if infestations have spread or have been reduced or eliminated, or if new infestations have become established.



**Black bindweed (*Polygonum convolvulus*), an invasive plant. Photo by Rick Turn**

[Link to Reference Report](#)

## 8. Invasive Species – Prevention and Control

**How effective were our management activities, including those done through partnerships, in preventing or controlling targeted invasive species?**

Prevention measures for invasive plants implemented in FY2014 were based on project and site-specific circumstances including overall risk of spread, degree of invasiveness of the non-native plants in the project area, and the likelihood of successfully preventing further spread.

A total of 60.6 acres of invasive plant treatments were completed in 2014, compared to 67.1 acres in 2013, 122.8 acres in 2012, 144.7 acres in FY 2011, and 222.5 acres in FY 2010.

Invasive plant prevention measures were implemented on the Ketchikan-Misty Fiords Ranger District in FY 2014 as part of projects



**Clipped Scotch thistle seed heads for disposal. Photo: USDA Forest Service**

and other activities. Weeds were monitored and removed in the Hyder area, including nearby quarries associated with mineral materials special-use permits. Monitoring invasive plant infestations at Quartz Hill was implemented during road inspections. A previously documented infestation of oxeye daisy was not relocated.



Tarp over orange hawkweed along the roadside on Zarembo Island, Wrangell Ranger District Photo: USDA Forest Service

The Petersburg and Wrangell Ranger Districts recently completed the first district-level invasive plant treatment environmental assessment (EA) on the Forest. This analysis covered all treatment options (manual, chemical, and mechanical) for high priority invasive species and sites within both ranger districts, including wilderness areas. Under this district weed EA, 2.6 acres of infestations were treated using herbicide.

Partnerships and educational activities are helpful in prevention and control efforts for invasive plants, both on National Forest System lands and lands outside agency jurisdiction. Invasive plant education/partnership activities were conducted on five ranger districts in 2014.

[Link to Reference Report](#)

## 9. Biodiversity Ecosystem – Old-Growth Associated Species and Subspecies

**Is the old-growth habitat protected under the Forest Plan being maintained to support viable and well distributed populations of old-growth associated species and subspecies?**

A non-significant Forest Plan Amendment was included in the Big Thorne Project Record of Decision for modification of the small old-growth reserves (OGRs) in the following VCUs: 5790, 5800, 5810, 5820, 5830, 5850, and 5950. The net result of these changes to the spatial distribution, size, and composition of the Old-Growth Habitat Land Use Designation (LUD) in these seven VCUs is an increase of 645 acres being added to the OGR system as well as an increase of 107 acres of POG. Road miles and

young-growth acres within the boundaries of the OGRs were reduced. The amount of POG, including large-tree and low elevation POG, interior forest acres, goshawk and marbled murrelet nesting habitat, and deer and marten winter habitat was reduced in some OGRs. The changes that occurred as a result of the Big Thorne ROD continue to meet the minimum Forest Plan acreage requirements, meet Old-Growth Habitat goals and objectives outlined in the Forest Plan, and are consistent with direction in Appendix K of the Forest Plan. Overall acreage of the reserve system has been increased by 645 acres, a very minor portion of the overall Tongass-wide conservation strategy acreage (change of less than one tenth of one percent of the Tongass National Forest).

[Link to Reference Report](#)

## 10. Biodiversity Ecosystem – Change in Old-Growth by Biogeographic Province

**Are the effects of biodiversity shown through the cumulative change in old-growth by biogeographic province consistent with the estimates of the Forest Plan (change could include effects of timber harvest, land exchanges or conveyance, windthrow, insect and disease, climatic change, etc.)?**

In FY2014, there were no changes in land use designations due to land exchange or conveyance since signing of the 2008 Forest Plan.

During FY2014, 2,488 acres of productive old-growth, 1,221 acres of high productive old-growth, and 99 acres of large tree stands were harvested across five biogeographic provinces. The finalization of the Sealaska land exchange in March 2015, was after the period covered by this monitoring report. This will be included in the FY15 monitoring report.

The effects of biodiversity shown through the cumulative change in old-growth by biogeographic province are consistent with the estimates of the Forest Plan. There have been no substantial changes in the last year as a result of land exchanges or conveyance, windthrow, insect and disease, climate or other changes that would result in a significant change in biodiversity.

### Lichen Monitoring

Epiphytic lichen communities are highly sensitive to changes in environmental pollution and climate, making them excellent candidates for long-term monitoring of ecosystem integrity (Root et al. 2014; 2015, Gauslaa 2014, Jovan 2008, Geiser & Neitlich 2007). They lack roots to store water and their physiology is completely dependent on humidity and rainfall occurring at times when temperatures favor photosynthesis (Palmqvist et al. 2008). They are intricately tied to many ecosystem processes

such as wildlife food, habitat, and nesting material, nutrient cycling and enhancing biodiversity.

Currently, this monitoring question is being answered by evaluating the effects on biodiversity as a result of cumulative change in old-growth habitat by assessing changes in the amount of potential old-growth habitat across the Tongass in relation to annual changes in timber harvest (Biodiversity Evaluation Criteria, USDA 2008b, pages 6-8). In 2014 and 2015, further refinements to help answer this question will be developed by modeling the existing lichen community data from old-growth habitats to identify climate zones

and indicator species to climate. The model can be used in the future to score monitoring plots based on species' presences and their climatic tolerances. Biodiversity of lichen communities in old-growth forests may be influenced by climate and therefore climate change.



**Old man's beard lichen (*Usnea longissima*) and others of similar morphology. Photo by Karen Dillman**

[Link to Reference Report](#)

## 11. Biodiversity Ecosystem – Old-Growth Matrix

### Is old-growth structure retained in the matrix adequate and is it representative of old-growth types across VCUs and across the Forest?

The 2008 Forest Plan replaced the goshawk and marten standards and guidelines with a legacy standard and guideline that requires legacy forest structure be maintained in specific value comparison units (USDA Forest Service 2008b, page 4-90). The intent of this standard and guideline is to maintain the matrix as a functional part of the conservation strategy for wildlife while providing flexibility to address on-the-ground issues while implementing timber sales. The standard and guideline is applied to harvest units located in value comparison units (VCUs) that may be at risk of losing their effective contribution to the conservation strategy due to past timber harvest. Therefore, it is intended to maintain the effective contribution of these at risk value comparison units by retaining sufficient legacy forest structure in harvest units (USDA Forest Service 2008b, page 4-90).



View of tree understory canopy from the ground in an old-growth stand,  
Photo: USDA Forest Service

The legacy standard and guideline was applicable to only one acre of the 2,707 acres of timber harvest completed in FY2014 for the following reasons, as listed in the 2008 Forest Plan and record of decision:

- The units harvested occurred in VCUs that were not listed as retention of legacy structure required because less than 33 percent of productive old-growth habitat was harvested (IBID);
- The units harvested were less than 20 acres in size (IBID); or
- The timber sale was under contract before the effective date of the 2008 Forest Plan (ROD Category 1, USDA 2008a, page 68-69).

Harvesting in FY2014 occurred in one VCU listed in the legacy standard and guideline. Legacy was not retained in the Power Lake timber sale in VCU 5860 (Thorne Bay Ranger District) because the harvest unit was less than 20 acres and the sale was listed as a Category 1 sale in the 2008 Forest Plan ROD. Harvest was just over one acre; one acre of legacy was also retained.

[Link to Reference Report](#)

## 12. Biodiversity Ecosystem – Rare Plants

### What are the cumulative effects of changes to habitats that sustain rare plants?

#### Prince of Wales Island Rare Plant Population Monitoring

Results indicate no significant change in lesser round-leaved orchid population density from 2013 to 2014. Monitoring data had indicated a significant annual decrease in density for the two previous years. This previous downward trend might have been related to periodic dormancy. Individuals of this species can become dormant for one or more years, and then continue growth. Although results suggest the decline in population density has stopped, continued monitoring is needed to see long-term population trends.

Monitoring data for whiteflower rein orchid populations did not show a significant change from 2013 to 2014.

For the two populations of large yellow lady's slipper, monitoring shows a 25 percent decrease in total individuals. This is in contrast to the 20 percent increase recorded between 2012 and 2013. This may be due to natural periodic dormancy of individuals.

#### Kruzof Island Dune Tansy Population Monitoring

Although newly erected barriers are helping to keep ORV traffic away from the dune tansy population and habitat, stream and beach

erosion continue to impact meadow habitat, threatening loss of individual plants. Continued stream and beach erosion of habitat is likely unavoidable and could eventually destroy the existing population. Salvage and transplanting threatened plants to adjacent suitable habitat is a strategy to prevent extirpation of this species on the Tongass.



**Large yellow lady's slipper. Photo by Kristen Lease**

Due to its relative common occurrence elsewhere in Alaska and globally, dune tansy was removed from the Alaska Natural Heritage Program rare plant tracking list in 2012. Consultation amongst professionals concluded that as the only known location of this plant in the region, it makes a significant contribution to the biodiversity of the Tongass.

[Link to Reference Report](#)

## 13. Streams and Fish Habitat – Management Indicator Species

**Are the trends in abundance of the fish management indicator species (Dolly Varden char, cutthroat trout, coho salmon, and pink salmon) related to changes in habitat associated with forest management, climate change or other factors?**

### Resident Dolly Varden Char and Cutthroat Trout Monitoring

A thorough statistical analysis of an 11-year resident fish dataset is complete and a manuscript is expected to be finalized and peer reviewed by winter 2015. The manuscript focus is landscape drivers of resident Dolly Varden char and Cutthroat trout presence, abundance, and size across the Tongass. We expect results of this analysis to provide insight on future resident fish monitoring efforts.

Because of the short duration of monitoring efforts under the newly revised protocol, no detailed analysis of results is practical at this time. Sampling efforts will continue.



Coho salmon fry, Photo: USDA Forest Service

### Coho Salmon Abundance Monitoring

Coho salmon occur in nearly 4,000 streams in Southeast Alaska. Annual wild commercial harvest of coho salmon in Southeast Alaska is reported by the Alaska Department of Fish and Game. The 2014 wild coho salmon harvest was 2.45 million fish, down from the 2013 catch of 2.57 million fish. Regardless of the 2014 wild coho salmon harvest decline from the previous year, it still ranked the 5th highest harvest since statehood (Skannes et al. 2015).

The 2014 average dressed weight of troll-caught coho salmon (6.4 lbs) was higher than 2013, just slightly above the 10-year average weight of 6.2 lbs., and 0.5 lb. heavier than the 5-year average (Skannes et al. 2015).

### Pink Salmon Abundance Monitoring

There are more than 2,500 pink salmon spawning streams in Southeast Alaska (Piston and Heintz 2011). Annual commercial harvest of pink salmon in is reported by the Alaska Department of Fish and Game. Commercial harvest is in part a good indicator of annual abundance and potential trends for pink salmon. According to ADF&G data, the total 2014 estimated Southeast Alaska (not including Yakutat area) pink salmon harvest of 37.2 million fish was below the recent 10-year average (2004-2013) of 41.5 million fish and above the long-term average harvests, ranking the 21st largest harvest since 1962 (Conrad and Gray 2014). The even-year low returns pattern has perpetuated since 2006 and continued in 2014, and was especially evident in Northern Southeast inside waters.

There were no pink salmon or pink salmon habitat monitoring efforts conducted during 2014. The forest discontinued attempts at framing a monitoring protocol for this species in 2010. A recommendation has been made to drop this species from the management indicator list because of the extreme difficulty in being able

to detect meaningful level of change as a result of Forest management practices.

The Tongass continues to work with ADF&G to review the annual pink salmon commercial harvest and escapement index data for general trend information.

[Link to Reference Report](#)

## 14. Streams and Fish Habitat – Aquatic Habitat Condition (Fish Passage)

### Is the natural range and frequency of aquatic habitat conditions maintained?

#### Fish Passage at Road Crossings

Upstream migration is essential for many fish species. Anadromous fish (fish that migrate from the ocean to freshwater to spawn) require access to spawning habitat. Juvenile anadromous fish migrate during their freshwater life stage, seeking seasonal habitats. Resident fish (fish that spend their entire life in freshwater) also may migrate seasonally in response to food, shelter and spawning needs. Providing for fish passage at stream and road intersections to ensure fish migration is important when constructing or reconstructing forest roads. Improperly located, installed or maintained stream crossing structures can restrict migrations, adversely affecting fish populations. These structures can present a variety of potential obstacles to fish migration. The most common obstacles are excessive vertical barriers, debris blockages, and extreme water velocities that can inhibit fish passage, especially smaller or juvenile fish.

As part of a multi-year monitoring project, 40 culverts on fish streams were monitored in FY 2014 to assess their ability to provide fish passage. These culverts were chosen from 246 culverts installed, reinstalled or retrofitted in fish streams from 1998 through 2014. The culverts monitored in 2014 are located on Chichagof, Wrangell, Zarembo and Prince of Wales Islands. From 2009 through 2013, 138 fish stream culverts were monitored on Kupreanof, Kuiu, Wrangell, Mitkof, Zarembo,

Revillagiedo and Prince of Wales Islands. Nine culverts installed in 2012 and 2013, using a Minimally Engineered Aquatic Organism Passage (MEAOP) design, are monitored annually including FY 2014.

The monitored fish stream crossings, constitute approximately 67 percent (164) of the culverts (excluding bottom-less culverts) recently installed, reinstalled or retrofitted on the Tongass.

Eighty-six percent of the culverts monitored are Green or Yellow and have met the acceptable passage criteria established in the Juvenile Salmon Passage Matrix. They are consistent with State of Alaska juvenile fish passage standards and are assumed to provide unimpeded juvenile and adult fish passage.



**Culvert Inlet, Road 3015250, Milepost 0.030 (Thorne Bay), Photo: USDA Forest Service**

Five percent of the culverts are Gray and require more comprehensive analysis to determine passage status. The remaining 9 percent are Red and are assumed not to provide adequate passage at all desired stream flows. The majority (68 percent) of the 164 stream crossings monitored were installed between 2000 and 2005.



**Culvert bedload, Road 3015250, Milepost 0.030 (Thorne Bay), Photo: USDA Forest Service**

The 15 crossings determined not to be consistent with juvenile passage standards can be generally attributed to different reasons:

1. Three of the 15 Red culverts were known fish stream crossings requiring passage considerations but were installed without fish passage design due to project personnel being unaware of aquatic passage objective.
2. Four of the Red crossings were installed without passage considerations because they were not identified as crossings requiring fish passage until after construction was completed.
3. Two of the culverts not meeting juvenile passage standards are MEAOP designed culverts and have not accumulated enough bedload within them to provide adequate roughness and moderate water velocity. These culverts will potentially continue to accumulate bedload.
4. Two of the Red culverts are stream simulated designed culverts that have had sections completely scoured free of bedload.
5. One culvert is not providing adequate passage because it is blocked by woody debris.
6. Three are Red due to inadequate fish passage design consideration.

[Link to Reference Report](#)

## 15. Streams and Fish Habitat – Riparian Vegetation

### Is riparian vegetation maintained or restored to a condition that supports key riparian functions?

Windthrow is a natural and important phenomenon of Southeast Alaska. It recycles forest stands while maintaining and renewing the forest ecosystem. Timber harvest has the potential to increase the rate of windthrow in adjacent stands, including riparian management areas (RMAs), beyond that found within the natural range of variability. Monitoring the incidence of windthrow in riparian management areas and comparing that to windthrow found in control riparian areas assesses whether the

buffers are retained within the natural range of variability.

The incidence and characteristics of windthrow is monitored in riparian buffers of Class I, II and III streams on the Tongass National Forest that are associated with timber sales consistent with the Forest Plan. Windthrow is monitored in both RMAs and within adjacent areas where trees are retained to provide a zone of reasonable assurance of windfirmness (RAW).

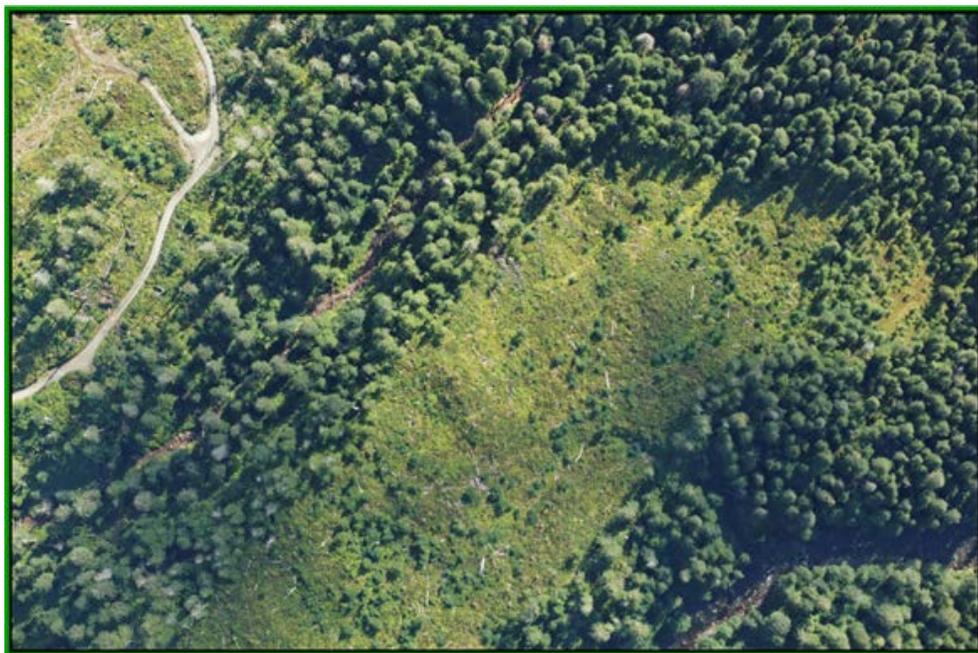
The amount of windthrow is measured as the number of windthrown trees compared to the total number of originally standing trees in the buffer. The number of trees felled due to windthrow is documented and measured using low-altitude digital still aerial photographs.

The year 2014 was the fifteenth consecutive year that windthrow within stream buffers was monitored. The monitored stream buffers are generally located within the southern half of the Forest, where recent timber harvest has occurred. There are 260 monitored stream buffers. They are located on five ranger districts and are associated with 36 timber sales and 142 units that were harvested from 2000 through 2007. This monitoring contains the majority of RMAs associated with harvest activity on the Tongass, during this period. Buffers are monitored annually for the first five years after harvest and then again 10 and 15 years after harvest. During 2014, buffers associated with units harvested in 2004 were resampled.

To date, not all acquired imagery has been analyzed. Analysis has not been completed on imagery collected from 2010 to 2014 for harvest units from 2003 to 2007. This represents 273 data points of the approximately 1,750 collected.

Based on the monitoring results, timber harvest has likely increased the rate of windthrow in the monitored areas beyond that found within the natural range of variability. However, the data

suggests that a large majority of the monitored buffers have remained mostly in natural conditions. No windthrow has been detected in 44 percent of the monitored areas and the average amount of cumulative windthrow is 6.8 percent. The cumulative windthrow mortality in the buffers is highly variable and ranges from zero to 85 percent.



**Low altitude digital aerial image of harvest unit and associated stream buffers, Photo: USDA Forest Service**

[Link to Reference Report](#)

## 16. Wildlife Terrestrial Habitat – Management Indicator Species

**Are population and habitat trends for Management Indicator Species (MIS) consistent with expectations?**

**Are these trends due to changes in habitat conditions or other factors?**

**If they are tied to habitat conditions, is there a direct relationship with forest management, climate change or other factors?**

**Terrestrial MIS include red squirrel, black bear, brown bear, marten, river otter, Sitka black-tailed deer, mountain goat, gray wolf, Vancouver Canada goose, bald eagle, red-breasted sapsucker, hairy woodpecker, & brown creeper.**

The 1982 regulations to implement the National Forest Management Act require that management indicator species (MIS) be identified as part of each forest plan. MIS serve multiple functions in forest planning: (1) establish explicit forest plan objectives for fish and wildlife habitat, (2) facilitate analysis of forest plan alternatives, and (3) provide a means to monitor the effect of forest plan implementation. Much of the direction for MIS is outlined in CFR 219.19, together with direction for ecosystem diversity and species diversity. As such, MIS represents one part of biodiversity and species management.

The 13 MIS identified for the Tongass are primarily associated with the spruce and

hemlock forests of Southeast Alaska that represent 98 percent of the productive old-growth forests (POG) of the Tongass. POG provides important habitat for many MIS. However, some species use a variety of different habitats but rely on prey species associated with old-growth (e.g., wolves).

Population and habitat trends of MIS are not included in this report. These analyses are completed every 5 years (see the 2012 Annual and 5 Year Monitoring and Evaluation Report for the most recent analyses of population and habitat trends).



**Black bear and bald eagle at Anan Creek, Wrangell Ranger District, Photo: Anan personnel**

Although trend information is not included here, monitoring did occur in FY2014.

The ADF&G completed sealing records on furbearers taken by any means and for any purpose. They also conducted hunter/trapper questionnaires.

Estimating Sitka black-tailed deer populations in Southeast Alaska is difficult because much of the landscape is densely vegetated; therefore, estimation techniques based on seeing the animals do not work well. For this reason, ADF&G and the Tongass use fecal pellet counts as an index for deer population abundance. The

assumption is that changes in the density of pellet groups reflect changes in the population. ADF&G is developing techniques for estimating mountain goat populations. They have been fitting mountain goats with radio collars in Southeast Alaska since 2005. A total of 354 goats were marked across four study sites.



**Sitka black-tailed deer, Photo: USDA Forest Service**

ADF&G and the Tongass have initiated a study on central Prince of Wales Island to develop a means for evaluating wolf abundance, appropriate management levels, and sustainability. This project duplicates the study undertaken during the 1990s, with the capture, radio-collaring, and monitoring of a sample of wolves. In addition to the radio-collaring effort,

wolf hair is being collected using noninvasive techniques (e.g., hair snares) to estimate numbers using mark-recapture methodologies. The U.S. Geological Survey (USGS) conducted the Alaska Landbird Monitoring Survey (ALMS) and Breeding Bird Survey (BBS). ALMS is administered by the USGS in Anchorage and is designed to monitor long-term trends in breeding populations of landbirds (and other bird species) within all ecoregions of Alaska. BBS is administered by the USGS Patuxent Wildlife Research Center in Maryland. The BBS is designed to provide a continent-wide perspective of population change in breeding birds.

The United States Fish and Wildlife Service (USFWS) has been conducting aerial surveys of bald eagles in Southeast Alaska since 1967. They also census waterfowl. These surveys generally take 5 years to complete. All saltwater shorelines are surveyed once in summer and in winter. One-fifth of the total saltwater shoreline is surveyed per year.

The University of New Mexico, in partnership with the Museum of Southwestern Biology, and in cooperation with the Forest Service and various Alaska agencies, completed field work on the Investigations of Southeast Landscapes including Endemic Species (ISLES) project in 2013 and turned in a final report during FY2014 (Cook et al. 2013).

[Link to Reference Report](#)

## 17. Wildlife Terrestrial Habitat – Federally Listed Threatened or Endangered & Region Sensitive Species

### Is current management providing for sufficient habitat of federally listed threatened or endangered species (TES) and Alaska region sensitive species?

No projects proposed in FY2014 on the Tongass are likely to have an adverse effect to threatened or endangered species. Most of the FY2014 projects are expected to have no effect on threatened and endangered wildlife or their habitat. Projects include special use permit renewals, trail maintenance, boat launch improvements, small timber sales, precommercial thinning, and fishpass and communication site maintenance.

Only one proposed project may affect listed species or their habitat but the effects are expected to be insignificant or discountable. Vessel traffic and Marine Access Facility activity associated with the action alternatives of the Saddle Lakes Timber Sale, located near Ketchikan on Revillagigedo Island, could have short-term minor effects to humpback whales. Forest Service operations, including those of permit holders and contractors, are required to follow the Marine Mammal Protection Act, reducing anticipated effects. Saddle Lakes Timber Sale is the largest project analyzed in FY2014 on the Tongass.

No proposed projects are likely to cause a loss of viability of Alaska Region sensitive species. The majority of “may adversely impact individuals, but not likely to result in a loss of viability in the planning area, nor cause a trend toward Federal listing” determinations were for

the Queen Charlotte goshawk. These projects included timber sales, precommercial thinning, trail work, and fishpass and communication site maintenance. No other projects are expected to have impacts on goshawks.

#### Northern Goshawk Nest Surveys

In FY2014, 25 goshawk call station surveys were conducted across three districts. No responses to calls were detected. No new active goshawk

nests were found. One historic nest location was surveyed and found the nest in usable condition. In addition, an area about 0.6 acre surrounding a potential drill site at the Hecla/Greens Creek Mine had a tree-by-



tree inspection for nests and nesting activity using binoculars; no nests or nesting activity was observed.

**Nesting goshawk**, Photo: USDA Forest Service

[Link to Reference Report](#)

## 18. Wildlife Terrestrial Habitat – Geographic Distribution

### What is the geographic distribution and habitat relationships of mammalian endemic species on the Tongass?

#### ISLES

The University of New Mexico and the Tongass collaborated to inventory mammals and their distribution on the Tongass through the ISLES (Island Surveys to Locate Endemic Species) project between 2009 and 2013. This work was a continuation of mammal inventory work started in 1991. The final report on their research was received in FY2014.

From 2010 through 2012, the University of Wyoming identified understory vegetation important to small mammal (including endemic species) diversity and abundance in young-growth forests on Prince of Wales Island. A final report was received in FY2014.

#### *Small Mammal and Carnivore Response to Tongass Young-growth Treatments*

This study assesses vegetation and structure of young-growth that influence small mammal abundance. This is relevant to marten, which rely on small mammals as prey. Study objectives include determining:

- Which Tongass-wide Young-growth Study treatments enhance the abundance of small mammals,
- The habitat variables the populations respond to, and
- The response of marten and ermine to small mammal abundance.

Four habitat types were studied: young-growth (control group), thinned young-growth, old-growth, and clearcut. Mark-recapture methods were used to estimate small mammal and marten abundance. Small mammals were live trapped and marten and ermine were trapped using hair-snares. DNA was extracted from the hair samples and used to identify individuals. Trapped small mammals studied and marked with a passive integrated transponder tag for permanent identification. Blood samples were taken from small mammals and, in combination with plant samples, stable isotope analyses was used to identify small mammal diets. Small mammal feces were collected for diet analyses. Vegetation was sampled to assess food availability (Flaherty and Ben-David 2012). Mice and shrew densities varied across the years and exhibited no relation to forest treatments. Ermine captures were correlated with the density of Keen's mice in the same year. Marten captures were correlated with the density of mice the previous year.

[Link to Reference Report](#)

## 19. Soil and Water – Soil Productivity

### Are the soil conservation practices implemented and effective in meeting Alaska Regional and Soil Quality Standards and maintaining soil productivity?

Soil quality monitoring in 2014 focused on 1) soil conditions following the use of ground-based yarding equipment on slopes over 30 percent gradient, 2) soil compaction on the North Kuiu Stream Restoration Project equipment access trails, and 3) the amount of soil disturbance caused by Off-Highway Vehicle (OHV) use for game retrieval on the Yakutat Forelands. Monitoring reports were written for each of these three projects.

1) In recent years, some loggers want to use shovel yarding on steeper slopes to reduce logging costs (shovel logging is about ½ the cost of a short span cable system and about ⅓ the cost of helicopter logging). Rutting, soil displacement, and soil erosion have been noted on some shovel trails where shovel yarding has been used on steep slopes.



Shovel yarder on a steep slope in the Diesel Timber Sale area, Photo: USDA Forest Service

In 2014, monitoring identified differences in soil conditions as a result of shovel yarding on different soil slope classes.

If a decision is made to allow ground-based equipment on slopes over 35 percent gradient, the trails should be agreed upon by the shovel operator and sale administrator and/or in consultation with a soil scientist. If allowed, a plan should be made for rehabilitating soil conditions on trails on slopes over 35 percent gradient.

2) The North Kuiu Island stream restoration project required about 1,200 pieces of wood. Most of this wood was moved to the stream with ground-based equipment. To move the wood to the stream, six access trails approximately 10 meters wide were cut through



Access trail associated with North Kuiu stream restoration project, Photo: USDA Forest Service

46 year old young-growth. The trails were needed for the machines to skid or swing the wood to the stream, similar to shovel yarding. Unlike shovel yarding, where 1 or 2 passes are made over a shovel trail, the number of passes required to move wood to the stream was typically more than 50 with some trails receiving more than 100 passes.

Soil bulk density samples indicate that overall the soils under the access trails are not compacted due to relatively low clay content,

the presence of thick duff layers and high organic matter content in the upper layers, and the relatively high rates of soil mixing and stirring due to windthrow and rooting of trees and other vegetation.

3) The Access and Travel Management Plan for the Yakutat District restricts OHV use to designated trails except for meat retrieval “if they can do so without causing resource damage”. Vegetation and soil disturbance can occur from even the limited ATV use associated with game retrieval, but it also seems likely that better drained areas where sweet gale and willow are dominant can support game retrieval.

[Link to Reference Report](#)



ATV tracks in Yakutat, Photo: USDA Forest Service

## 20. Soil and Water – State Water Quality Standards

### Are the soil and water conservation practices as described through the Best Management Practices and site specific prescriptions implemented and effective in minimizing soil erosion and maintaining the State Water Quality Standards?

The Best Management Practices (BMPs), described in the Soil and Water Conservation Handbook (Alaska Region Supplement to Forest Service Handbook 2509.22, 2006), define practices that protect soil and water resources. The Soil and Water standards and guidelines define site-specific measures to protect the resources. These standards and guidelines were monitored using national forms and protocols.

The FY 2014 BMP Monitoring Report provides details on how the monitoring was conducted.

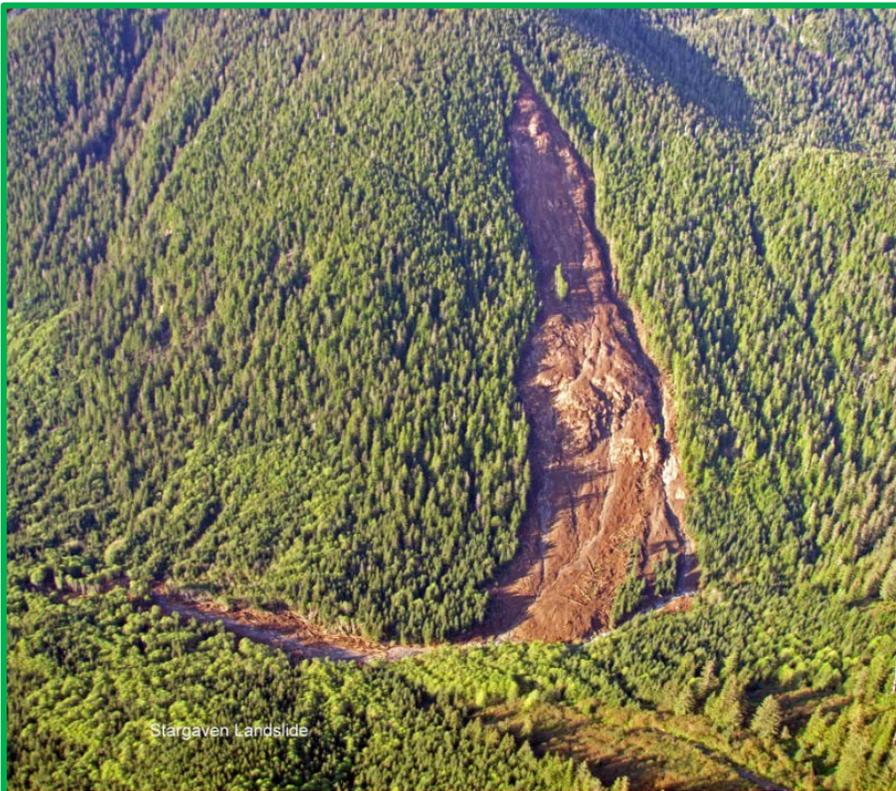
The Forest Plan BMP monitoring program to date has emphasized evaluation of timber harvest units and roads. The National BMP monitoring program places equal emphasis on all resource activities. A regional target of seven resource activities was assigned to the Tongass National Forest and accomplished in 2014. Five randomly selected activities (timber harvest, facilities, recreation, and aquatic restoration) were monitored. Two other activities (minerals and roads) were not required to be randomly selected.

Generally, the monitoring completed by the interdisciplinary teams showed that the BMPs were mostly or fully implemented during timber harvest, roads, and facilities activities. Some BMP implementation improvements are needed in recreation, roads, aquatic restoration, and minerals activities.

Field observations indicate that BMPs were generally effective in limiting or preventing sediment transport to water bodies during timber harvest and facility activities. Actions were identified to improve BMP effectiveness during roads, minerals, aquatic restoration, and recreation activities.

#### [Link to Reference Report](#)

**Landslide at Starrigavan, Photo by John Reed, Harris Air Pilot**



Starrigavan Landslide

## 21. Soil and Water – Watershed Health

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**What is the ecological condition and trend of watersheds in terms of key characteristics (such as soil productivity, water quality and quantity, invasive species, etc.) of watershed health identified in the desired condition (aquatic ecosystem potential) of the plan area? How effective are management actions in improving watershed health (maintaining or moving watersheds toward Condition Class I)?**

As part of the Forest Service National Watershed Condition Framework watersheds were classified across the Tongass.

Most of the 900 watersheds on the Tongass are in near natural condition. Sixty-eight watersheds were rated “at risk” for maintaining ecological functions and aquatic resources due to management that occurred between 1950 and 1979. Measures are now in place to protect and maintain watershed health.

Eighteen Tongass stream reaches were sampled in 2013 and 17 in 2014.

Data was collected in 2014 as part of the Tongass-wide watershed restoration effectiveness monitoring (WREM) strategy, including stream habitat and fish response.

The Twelvemile Creek watershed smolt investigation continued for a third year.

Project monitoring reports were completed for restoration projects on Harris River and Twelvemile Creek.



Salmon Creek reference reach, Photo: USDA Forest Service

[Link to Reference Report](#)

## 22. Wetlands

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**Were the wetland conservation practices implemented and effective to avoid and/or minimize impacts to wetlands to the extent practicable?**

Wetland-road monitoring has been on a two-year cycle, odd years for field work and the even years for report writing.

In FY 2013, a protocol was written to test the magnitude and extent of elevated pH associated with limestone roads across wetlands. In August of 2013, the protocol was implemented and pH and vegetation data was collected in seven wetlands.

Downslope pH was significantly elevated (90 percent confidence) in four of the seven wetlands sampled. Soil samples, from the three transects where field pH was notably different, were sent to Oregon State University's Central Analytic Lab for analysis. The lab analysis included extractable Potassium, Calcium, Magnesium, Sodium and pH. In three of the 4 wetlands, the elevated pH downslope of the road appeared to be due to the chemical reaction of relatively acidic wetland water in contact with and flowing past high pH/basic limestone road fill.

In the three wetlands where elevated pH was found, the effects on wetland vegetation composition and structure appear to be negligible, including areas where elevated pH was identified downslope of limestone road segments.

Maidenhair fern was found on four of our plots in three different wetlands. On the Tongass maidenhair fern appears to be a good indicator



**Maidenhair fern and redcedar growing on the edge of a limestone shot rock road, Photo: USDA Forest Service**

of a calcium rich, near neutral pH substrate. Maidenhair fern is often found growing on limestone outcrops and on the edge of limestone shot rock roads.

[Link to Reference Report](#)

## 23. Karst and Cave Ecosystems

### **Are the biological, mineralogical, cultural, paleontological components, and recreational values of the karst and caves maintained?**

Monitoring was completed on projects implemented under Forest Plan direction. Work completed under the Karst and Cave Standards and Guidelines included preliminary inventory, cave inventory and mapping, timber harvest unit and road reconnaissance, timber harvest unit layout, and road layout.



**Thrush Cave moonmilk, Photo by Jim Baichtal**

The Forest Plan was implemented to the fullest extent practicable. The Karst and Cave Standards and Guidelines showed through effectiveness monitoring to ensure a high level of protection for significant caves and karst resources.

In FY2014, a minor amount of logging occurred on karst lands with prescribed mitigation. Monitoring of some of the small sales evaluated 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. No substantial changes as a result of management activities were documented within the known cave systems.



**Dall Island epikarst, Photo by Jim Baichtal**

[Link to Reference Report](#)

## Human Uses and Land Management

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### 24. Timber Resources – Economic Timber Sales, Shelf Volume, and Contract Volume

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Is the timber management program meeting the objectives of achieving economic timber sales and rebuilding the volume under contract and shelf volume components of the sale program? In FY 2014, the Tongass offered 120 million board feet (MMBF) of timber, sold and awarded 100 MMBF and had 449.00 MMBF in no-bid timber sales that remained unsold at the end of

the fiscal year. In FY 2014, the purchasers harvested 39 MMBF and had an ending inventory of 152.834 MMBF. The 5 year average annual harvest is 36 MMBF/year. The Tongass has not been able to establish sufficient shelf volume to maintain flexibility and stability in the sale program.



Hoonah lumber yard, Photo by Terry Fiske



Hoonah lumber yard, Photo by Terry Fiske

[Link to Reference Report](#)

## 25. Timber Resources – Standards and Guidelines

**Are timber harvest activities adhering to applicable timber management standards and guidelines relative to: created openings exceeding the maximum size limit for unit harvest, harvest on slopes greater than 72 percent slope gradient, or within the 1,000 feet beach and estuary buffer?**

### Created openings

There were 2,722 acres fully or partially harvested during FY2014. Of these acres, 1,324 acres were clearcut. The 100-acre size limitation applies to all clearcut harvest units. Of the total harvest acres that created openings from 2000-2014, seven units exceeded the 100-acre limit, but none went over 148 acres. All seven units were analyzed and approved in project-level Records of Decision.

During FY2014, 97 harvest areas (timber stands) were reported as harvested in the Forest Service Tracking Activity System (FACTS) database.

The majority of openings (78 percent) were 40 acres or less in size. Two exceeded 100 acres. Of the 1,324 acres managed via the even-aged system, 29 percent retained a portion of the original stand structure through the retention of leave trees. The remaining 71 percent received a traditional clearcut.

Additionally, 14 stands were harvested using two-aged management totaling 301 acres. Both group selection (2 acre or less openings) and single tree selection prescriptions were used on 49 stands to implement uneven-aged silvicultural systems on 1,398 acres.

### 72 percent slope

In 2014, approximately 30 acres of timber harvest occurred on slopes over 72 percent gradient.

### 1,000 feet beach and estuary buffer

Of the total 2014 harvest, there were 67 acres of windthrow harvest in six units that were salvage harvested within the 1,000-foot beach and estuary buffer. This harvest was authorized under the Zarkof Salvage Sale on Zarembo Island on Wrangell Ranger District.



Logger harvesting a marked tree, Photo by Chris Budke

[Link to Reference Report](#)

## 26. Timber Resources – Allowable Sale Quantity

### Is the ASQ land base consistent with resource information and programmed harvest?

The allowable sale quantity (ASQ) for the Tongass National Forest as specified in the 2008 Forest Plan is 2.67 billion board feet for the first decade following implementation of the plan.

For FY 2004 through FY 2014, the average annual volume sold was 5,388 million board feet (MMBF) or 20.05 percent of the annual Allowable Sale Quantity. This information is presented to observe the trend in recent allotment of timber sale ASQ. The decline in timber sale volume is based on a variety of factors including economic conditions, harvest costs, and litigation.



Tonka sort yard, Petersburg Ranger District, Photo by Carol Seitz-Warmuth

[Link to Reference Report](#)

## 27. Timber Resources – Tongass Timber Reform Act

### Is the timber demand being met within limits of the adaptive management strategy and Tongass Timber Reform Act (TTRA)?

Seek to provide an economic timber supply sufficient to meet the annual market demand for Tongass National Forest timber and the market demand for the planning cycle, up to a ceiling of the Forest Plan's allowable sale quantity, which is 2.67 billion board feet in the first decade. The annual market demand forecast is a methodology used to set the short-term goals for the Tongass Timber Program – volume the Forest plans to offer in the current year, pending sufficient funding and sufficient National Environmental Policy Act (NEPA)-cleared volume. NEPA-cleared volume is defined as NEPA documents with a signed decision.

In FY 2014, all timber harvest offered and harvested was from Phase 1 lands. In FY 2014, the Annual Demand Calculation was 127 MMBF using the expanded lumber scenario. In FY 2014, the Tongass offered 120 MMBF, sold 100 MMBF and had 449 MMBF in no-bid timber sales. Timber harvest for FY 2014 was 39 MMBF.

Since the amount of harvest is less than 100 MMBF, it indicates that the Tongass timber harvest planning efforts should continue in

Phase 1 areas on the Forest with the exception of small sale opportunities. At the end of fiscal year 2014, the corrected volume under contract was approximately 119 MMBF. Since the demand calculation estimates that there should be an estimated 127 MMBF under contract, the objectives of TTRA are not being met and efforts to establish shelf volume should continue.

[Link to Reference Report](#)

Front loader at an LTF on Tuxekan Island, Photo: USDA Forest Service



## 28. Timber Resources – Adaptive Management Strategy Threshold

### Has a Timber Sale Adaptive Management Strategy threshold been reached, so that it is appropriate to move to the next phase?

The timber program will be restricted to Phase 1 areas until harvest levels reach 100 MMBF for 2 consecutive fiscal years. After reaching the harvest level, timber management activities can be planned on Phase 2 areas, which include all Phase 1 areas.

In FY2014, the Tongass offered 120 MMBF, sold 100 MMBF and had 449 MMBF in no-bid timber sales. Timber harvest for FY 2014 was 39 MMBF.

The total volume harvested has not exceeded 100 MMBF in the last decade. Harvest less than 100 MMBF indicates that the Tongass timber sale planning efforts will continue in Phase 1 areas on the Forest.

[Link to Reference Report](#)

## 29. Timber Management – Non-Interchangeable Components

### Are the non-interchangeable components (NICs) of the allowable sale quantity consistent with actual harvest?

The ASQ consists of two separate non-interchangeable components (NICs) that are established to meet Forest Plan objectives.

**NIC I. Normal Operability:** This is volume scheduled from suitable lands using existing logging systems (tractor, shovel, standard cable, and some helicopter). Most of these lands are expected to be economic under projected market conditions. On average, sales from these lands have the highest probability of offering a reasonable opportunity for a purchaser to gain a profit from their investment and labor. This is the best operable ground.

**NIC II. Difficult and Isolated Operability:** This is volume scheduled from suitable lands that are available for harvest using logging systems not

in common use in Southeast Alaska. Most of these lands are presently considered economically and technologically marginal.

NIC evaluation criteria include: 1) Volume harvested by logging system from suitable lands from commercial forest timber stands that are healthy. 2) Volume harvested by logging system from suitable lands from commercial forest timber stands that are unhealthy and currently in a non-productive status, for example yellow-cedar decline and blowdown with heavy sap rot or breakage. 3) Distance from the setting to landing. For helicopter settings, settings over three-fourths of a mile flight distance from landings, either on the land or in the water, is considered NIC II.

In FY2014, there was approximately 39 MMBF harvested from the Tongass. All of the harvest was in NIC I areas.

[Link to Reference Report](#)

## 30. Timber Management – Proportional Mix of NIC I and NIC II

### Is the proportional mix of volume in NIC I and NIC II as estimated in the Forest Plan accurate?

Under the 2008 Forest Plan Amendment, the ASQ is divided into NIC I and NIC II. The proportional mix in the Forest Plan is set at approximately 89 percent NIC I (238 MMBF) and 11 percent NIC II (29 MMBF) harvested annually.

NIC components are estimates designed to prevent the disproportionate harvest of the most economical portions of the Forest over the long term. Limits on each component are binding on a decadal basis. The components are non-interchangeable because lower sale level in one

component may not be compensated by higher sale levels in the other.

The NIC I component includes land that can be harvested using “normal operability” logging systems such as shovel and short span cable. The NIC II component includes difficult and isolated operable timber stands requiring special logging equipment requirements due to yarding distances or topography. Unless the annual offer volume approaches the NIC I allowable volume of 238 MMBF, NIC II over-harvest is not likely to occur.

In FY2014, there was approximately 39 MMBF harvested from the Tongass. All of the harvest was in NIC I areas. Timber harvest consisted of 70 percent conventional logging systems and 30 percent helicopter logging systems.

Active logging operation, Photo by A. Gallo.



[Link to Reference Report](#)

## 31. Transportation System – Standards and Guidelines

**Are the standards and guidelines used for forest development roads and log transfer facilities effective in limiting the environmental effects to anticipated levels?**

### Roads

FY2014 monitoring showed that the maintenance program on the road system limited environmental effects. Sediment transport of eroded materials from the road surfaces was minimal. Road surfaces were in excellent condition and showed no ruts or water diversion. The monitored culverts were transporting water across the road and no culvert maintenance issues were noted; no head cutting or bank erosion was noted.

### Log Transfer Facilities

Each log transfer facility (LTF) is operated by permits in accordance with Alaska Water Quality Standards and requirements from the Environmental Protection Agency (EPA) for storm water discharge. Bark monitoring is required annually for each LTF under the EPA general NPDES permits.

Logging operations did put wood into marine waters in fiscal year 2014. Logging operations were ongoing in the fall, and bark monitoring dives had not yet been completed.

During periods of log transfer operation, receiving waters at the LTF shall be visually monitored daily for the presence of oil sheen. In

FY2014, all active LTFs were operated in accordance with their permits. No fuel or hydraulic fluid spills occurred.

The running surface of the Tonka LTF was in good condition; the surface is graded weekly as needed. The sort yard running surface was well graded and clean of bark. The Tonka sort yard settling pond showed some need for clean-out. The system of settling ponds is functioning well to filter out the fine sediment. The settling pond was cleaned out before the end of the 2014 operating season.



Tonka sort yard; settling pond.

Photo by Carol Seitz-Warmuth

[Link to Reference Report](#)

## 32. Transportation System - Maintenance

**Are the roads and trails maintained in accordance with management objectives?**

The 2005 travel management rules require the designation of roads, trails, and areas that are open to public use. It prohibits the use of motorized vehicles outside designated areas.

Part of these rules included developing motor vehicle use maps (MVUMs) for each district. All roads monitored in FY2014 were shown accurately on the MVUM.

FY2014 monitored roads included road 6351 on the Tonka road system (Kupreanof Island), road 3015 on the North Thorne road system (Prince of Wales Island), road 7576 Harbor Mountain,

road 7513 Starrigavan campground (Sitka), Frenchy road 6208 on Mitkof Island, and Kruzof North Beach ATV trail 317591 (closed part of road 7591).

### Closed Roads Maintenance Level 1

Closed roads (maintenance level 1) do not appear on the MVUM unless designated as a motorized trail, such as the Road 7591 conversion to motorized Trail 317591. The maximum vehicle width on this route is 60 inches.

### Open Roads Maintenance Levels 2-5

FY2014 monitoring shows that MVUMs consistently make motor vehicle access prohibitions known. However, the map by itself is not completely effective in eliminating access. This was underscored on Trail 317591, where users labored to modify structures to access the road that had recently been changed to maintenance level 1. Roads where culverts and bridges were removed were effective in eliminating unauthorized motorized use. Unauthorized use by OHVs did not cause any environmental damage or concerns on the routes

evaluated. Monitoring of maintenance level 2-5 roads showed that roads are being maintained according to the road maintenance objectives.



**Frenchy Road 6208**

**Photo: USDA Forest Service**

[Link to Reference Report](#)

### 33. Mining and Minerals Exploration

#### **Are Federal regulations (36 CFR 228) to ensure surface resource protection implemented and is the administration of this regulation through the Forest Plan effective in limiting soil and water resource impacts?**

A wide range of mineral resources and deposit types occur within the boundaries of the Tongass National Forest. Examples include, but are not limited to, gold, silver, molybdenum, and uranium, also nationally designated “strategic” and “critical” minerals such as lead, zinc, copper, tungsten, and rare earth elements.

The Forest Service recognizes that minerals are fundamental to the Nation and, as policy, encourages the orderly exploration and development of mineral resources. The Secretary of Agriculture has provided regulations to ensure surface resource protection during mineral exploration and development.



**Green's Creek Mine**

**Photo: State of Alaska**

The Tongass administered two large locatable mine plans (Greens Creek and Kensington Gold Mine) and processed several dozen exploration-drilling programs and mineral material operations (Herbert Glacier Project, Salt Chuck Exploration Project, Bokan Project, Wowoedski Island Project, Zarembo Island Project, Marx Creek Quarry, and Shoal Cove Quarry).

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. Fiscal Year 2014 inspections of mineral sites indicate that the effects of mining activities on surface resources are consistent with Forest Plan expectations.

The Tongass is also engaged in an on-going effort to mitigate the dangers posed by Abandoned Mine Land (AML) features. These features include tunnels, adits, shafts, tailing ponds, rock dumps, mill sites and other associated mining features.

[Link to Reference Report](#)

## 34. Subsistence Management

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

Title VIII of the Alaska National Interest Lands Conservation Act provides for customary and traditional uses by rural Alaska residents of wild renewable resources for direct personal or family consumption as food, shelter, fuel, clothing, tools, or transportation. Non-wasteful subsistence uses of fish and wildlife and other renewable resources are the priority consumptive resource uses on the public lands of Alaska. If take restrictions are required to maintain resources, restrictions to subsistence uses will be last.

Eleven fisheries assessment projects were conducted in Southeast Alaska in FY 2014. Ten projects assessed sockeye salmon harvests and escapements for stocks that sustain subsistence fisheries. One project surveyed Unuk River eulachon.



**Salmon in fish trap.**

**Photo by Justin Koller**

Aerial moose surveys were conducted near Yakutat in 2014.

A review of project level subsistence analyses will occur in 2017 to determine the effects of the Forest Plan on subsistence uses. 2017 was selected because trends in fish and wildlife populations and subsistence uses generally require long term data sets.

[Link to Reference Report](#)

## 35. Wilderness

### Is the wilderness character being maintained?

The Tongass Wilderness Character Monitoring plan was signed by September 2012. While components of the monitoring were identified and the sampling methods refined and tested in 2013, trends cannot be identified until additional monitoring is done.

There can be no conclusions regarding the success or the maintenance of the wilderness character on the Tongass until the trends are established.

Progress in 2014 in establishing the baseline needed to respond to the ongoing wilderness character monitoring question was facilitated by grants of \$95,100 provided by the Washington Office,

integrated projects and through the increased participation of regional non-profit organizations interested in wilderness stewardship. These grants and integrated projects improved the work in wilderness stewardship across the Tongass.



Some results for components of the wilderness character are being reported separately by resource (for example, air quality and invasive plants). There has not been enough information collected to determine whether or not the wilderness character of each wilderness is being maintained.

Protocols have been developed, or are being formulated, to address invasive plants, lichen monitoring, wilderness development indexing, preserving outstanding opportunities for solitude, measuring encounters, and campsite inventories.

**Admiralty National Monument  
stewardship project – invasive plant  
removal**

**Photo: USDA Forest Service**

[Link to Reference Report](#)

## 36. Heritage Resources

### Are (1) project clearance/ inventory, (2) project implementation, (3) mitigation, and (4) enhancement completed in accordance with the requirements and regulations for heritage resources?

Heritage specialists recorded 105 undertakings on the Tongass in FY 2014. Of those, 27 were reviewed under the Standard 4-part process in Section 106 of the National Historic Preservation Act and involved evaluating sites for National Register eligibility as well as evaluating potential impacts from agency undertakings.



Student volunteer Sara Gross excavates test pit.

Photo by Jeff DeFreest

Four of the projects were determined to have an Adverse Effect to sites eligible to or listed in the National Register and required mitigation through a Memorandum of Agreement with the State Historic Preservation Officer (SHPO).

The activities within the remaining 78 agency undertakings met the criteria for evaluation under the Programmatic Agreement with the

SHPO. Section 110 activities include direct monitoring and condition of sites, as well as partnerships and educational activities that enhance understanding and protection of cultural resources.

In summary, the forest plan's standards and guidelines appear to be complying with the requirements to identify and protect the forest's significant cultural resources. Most of the monitored sites are stable and in good condition, with only a few being actively eroded through natural means, or experiencing adverse effects from visitors.

Decreasing funding challenges the monitoring program to look for alternative methods to carry out the work. In this case, the staffs introduce efficiencies by working cooperatively with other program areas to visit sites.



Volunteer Tom Metke excavates a stake.

Photo by Martin Stanford

[Link to Reference Report](#)

### 37. Recreation

**Are areas of the Forest being managed in accordance with the prescribed Recreation Opportunity Spectrum (ROS) class in Forest-wide Standards and Guidelines? Is the ROS classification consistent with public demand?**

Outfitters and guides provided more than 600,000 recreation visitor days of guide services on the Tongass National Forest in FY 2014. Guides provided nature touring, hiking, flightseeing, rafting, dog-sledding, wilderness adventures, and big game guiding.

The Tongass maintains more than 350 developed recreation sites across the Forest. These include 2 major visitor centers, 4 major wildlife and fish viewing sites, almost 200 shelters and cabins, 12 campgrounds, and more than 40 day use or interpretive sites. The Tongass also manages more than 400 miles of hiking trails, of which almost 92 miles of trail are within congressionally designated wilderness. Another 400 miles of motorized trails are identified on district motor vehicle use maps.

In 2013, the Tongass completed an environmental assessment to determine whether or not to remove 12 cabins. Most of the cabins proposed for removal were available for public use through the National Recreation Reservation System, but had seen little to no use for several

years. Some of the cabins were in disrepair and not safe for use. As the manual requires the Forest Service to maintain facilities to a safe standard for the public, removing these cabins will allow funding for the operation and maintenance of these sites to be used in other locations where public demand is higher. In 2014, three of these cabins were removed. Others will be removed or converted to shelters in the coming years.



Naha Trail, Photo: USDA Forest Service

[Link to Reference Report](#)

## 38. Wild, Scenic and Recreational Rivers

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

The 2008 Forest Plan identifies thirty one rivers (or segments), pending designation by Congress as Wild, Scenic, or Recreational Rivers. Approximately 536 miles of rivers on the Tongass are included in this recommendation to maintain the eligibility of the total miles of river for the Wild, Scenic, or Recreational classification.

No projects proposed effects to proposed Wild, Scenic or Recreational River characteristics and no NEPA documents completed that evaluated impacts to these characteristics in FY 2014.

No monitoring was required or completed.



**Petersburg Lake, morning.**

**Photo: USDA Forest Service**

[Link to Reference Report](#)

## 39. Scenery

### Are the adopted scenic integrity objectives established in the Plan met?

In FY2014, Tongass National Forest landscape architects completed 14 analyses for compliance with Scenery Standards and Guidelines as part of implementing the Forest Plan. There were also numerous minor scenery resource support efforts for Special Use Permits and small district projects (modifications to cabins, communication sites, a fish pass, and small-scale tree thinning). Some of these projects will be monitored in the future during implementation.

Many projects implemented during 2014 (other than timber sales) were evaluated using the “exception for small areas of non-conforming developments, such as recreation sites, transportation developments, log transfer facilities and mining development... on a case-by-case basis” as allowed by the land use designation (LUD).

In these situations, the scenic integrity objectives (SIO) allowed under the exception often differs from the SIO established by the LUD standards and guidelines because the benefit to the public of the development or management activity has been judged to

outweigh the need to strictly conform to the original SIO.

The monitored projects met designer expectations regarding effects to scenery.



Vegetation plugs near Raven’s Roost Trail rest area. Photo by Carol Jensen

[Link to Reference Report](#)

## Economic and Social Environment

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### 40. Economics

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#### Are the effects on employment and income similar to those estimated in the Forest Plan?

The following employment sectors best represent the Tongass contribution to Southeast Alaska's economy.

##### Lumber and Wood Products

Logging and sawmill employment levels have remained fairly stable with minor variations since 2008. The current level of harvest and industry employment is due to a complex array of factors.

##### Recreation and Tourism

The industry sectors, which may include recreation and tourism employment, show a slight decline over the past eight years (2008-2014). We cannot be sure how this relates to Forest Plan implementation. These sectors are complex and depend on many factors including local, state and national economies. The National Visitor Use Monitoring (NVUM) data provides estimates for economic contributions of the Tongass on the recreation and tourism industry, however, the estimates cannot be compared with employment projections provided in the 2008 FEIS because they use different methods.

##### Mining

The mining industry has experienced steady growth in the past five years. It is unlikely that this growth is related to 2008 Forest Plan direction but is likely tied to global market demand and prices.

##### Salmon Harvesting and Processing

There has been slight growth in the salmon processing industry over the past five years. While it may be difficult to draw a direct correlation between processing employment and Forest management activities, the 1997 FEIS lists a series of assumption about this relationship that indicates that they may be closely related. The Forest Plan assumes that 80 percent of the commercially caught Southeast Alaska salmon originate on the Tongass. Fish processing employment was derived similarly with the added assumption that salmon represented 60 percent (on volume basis) of the total processed catch. About 48 percent of seafood processing employment is assumed to be dependent upon the Forest (1997 FEIS, page 455). If these assumptions are true, then Tongass activities may have had a positive effect on the salmon seafood processing industry. Though, trends in salmon harvesting and processing are dependent on many factors.

##### Federal Government

Although holding steady for the past two years, overall federal government employment has declined since 2008. This may be due to a number of factors including consolidation of positions, lower budgets from Congress, and a decreased number of projects (timber, recreation, and road building). Due to the lower federal government employment, some smaller communities may experience difficulty attracting other services and industries (2008 FEIS, page 3-498).

[Link to Reference Report](#)

## 41. Costs and Outputs

### What is the trend in outputs and costs associated with those outputs?

(PAS) Regional Accomplishment by Forest Report for Fiscal Year (FY) 2014. The output tables in some of the previous years followed a different order.

This output information was obtained from the national Performance Accountability System

**Economics Table 1. Allocated and expended funds for FY2014 monitoring and evaluation**

<b>FY 2014</b>	<b>Description</b>	<b>Allocated</b>	<b>Expended</b>
Subtotal	Appropriated Funds	\$47,236,062	\$47,495,570
Subtotal	Permanent & Trust Funds	\$ 5,835,391	\$ 5,651,376
<b>TOTAL</b>		<b>\$53,071,453</b>	<b>\$53,146,946</b>

**Economics Table 2. A sample of the outputs for FY2014**

<b>Planning, Inventory and Monitoring</b>	
Annual Monitoring Requirements Completed	31 requirements
Acres of Inventoried Data Collected and Acquired	4,389,240 acres
Land Management Plan (LMP) Amendments Underway	0 amendment
Land Management Plan (LMP) Assessments Completed	0 assessment

[Link to Reference Report](#)

## Tongass Inventory & Monitoring Program Contact

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Inventory & Monitoring Program

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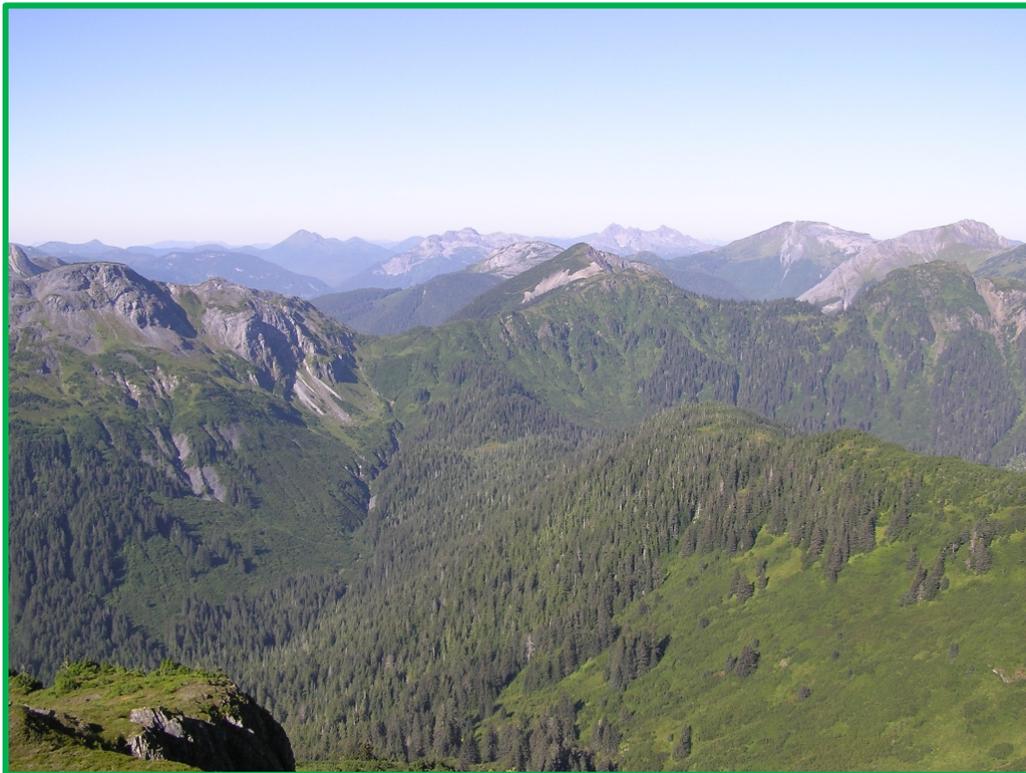
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**Tongass National Forest Online:**

[www.fs.usda.gov/goto/R10/Tongass/Monitoring](http://www.fs.usda.gov/goto/R10/Tongass/Monitoring)

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Chichagof Karst Ridges, Photo by Jim Baichtal