United States Department of Agriculture

Biennial Monitoring Evaluation Report
Tongass National Forest

Fiscal Years 2020-2021

Forest Service

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Cover photograph: Streams and Fish Habitat photo 1

Panel of three tall photos (top to bottom) demonstrating a time sequence of 1) An existing smaller culvert and a heavy water flow exiting it flowing down the hillside; 2) the culvert removed and water at the top of the visible side of the hill pooled and not flowing; and 3) The post-replacement larger culvert, approximately 5 ft. tall with water flowing down the hillside with much less volume than the smaller culvert.
US Forest Service 2021

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Introduction

Purpose

The purpose of the biennial monitoring evaluation report is to help the responsible official determine whether a change is needed in Forest Plan direction, such as plan components or other plan content

that guide management of resources in the Plan area. The biennial monitoring evaluation report evaluates monitoring questions and indicators presented in the Plan Monitoring Program for the Forest Plan in relation to management actions carried out in the Plan area.

Monitoring and evaluation are continuous learning tools that form the backbone of adaptive management. Under the 2012 Planning Rule we will produce an evaluation report every 2 years. This is our first Monitoring Evaluation Report since the 2016 Tongass National Forest Land and Resource Management Plan (Forest Plan) was finalized. This report indicates whether a change to the Forest Plan, management activities, monitoring program or forest assessment may be needed based on the new information. The Tongass National Forest monitoring reports are available at https://www.fs.usda.gov/detail/tongass/landmanagement/planning/?cid=stelprdb5368225.

Objectives

There are several objectives for this report, including:

- Assess the current condition (i.e., status) and trend of selected forest resources.
- Document implementation of the Plan Monitoring Program including changed conditions or status of key characteristics used to assess accomplishments and progress toward achievement of the selected Forest Plan components.
- Evaluate relevant assumptions, changed conditions, management effectiveness, and progress towards achieving the selected desired conditions, objectives, and goals described in the Forest Plan.
- Assess the status of previous recommended options for change based on previous monitoring and evaluation reports.
- Document any scheduled monitoring actions that have not been completed and the reasons and rationale why it has not.
- Present any new information not outlined in the current Plan Monitoring Program that is relevant to the evaluation of the selected monitoring questions.
- Present recommended change opportunities to the responsible official.

How to Use this Report

This report is a tool and a resource for the Forest Service to assess the condition of forest resources in relation to Forest Plan direction and management actions. It is also a tool and a resource for the public to learn more about how the Forest Service is managing forest resources.

The biennial monitoring evaluation report is designed to help the public, as well as Federal, State, local government, and Tribal entities anticipate key steps in the overall monitoring program. These steps include upcoming opportunities for public participation and how the public will be informed of those opportunities, and how public input will be used as the monitoring program progresses. The biennial monitoring evaluation report is also intended to help people better understand reported results in relation to past monitoring reports, future monitoring reports, and the broader-scale monitoring strategy that is issued at the Forest Service regional level.

The Importance of Public Participation

We informed the public of the availability of the 2020-21 biennial monitoring report for the Tongass National Forest on [provide date], through the Tongass public webpage at http://www.fs.usda.gov/goto/R10/Tongass/Monitoring and a notice through GovDelivery to those

individuals that signed up for updates. These notices include the name and address of a Forest Service contact and the location to submit comments - comments-alaska-tongass@usda.gov. These efforts help "to obtain public feedback on what the monitoring information suggests about the effectiveness of the land management plan" (Forest Service Handbook [FSH] 1909.12_42.14c).

Our intent for public participation is to provide full transparency by giving people access to all information that is developed through monitoring activities and to obtain public feedback.

About Our Forest Plan Monitoring Program

In the context of forest planning there are three main monitoring goals:

- Are we implementing the Forest Plan properly? Are we meeting our management targets and project guidelines? (Implementation monitoring)
- Are we achieving our Forest Plan management goals and desired outcomes? (Effectiveness monitoring)
- Does our hypothesis testing indicate we may need to change the Forest Plan? (Validation monitoring)

Implementation monitoring is important for tracking progress and accomplishments. However, it is effectiveness and validation monitoring that drive and support the adaptive management process. Effectiveness monitoring evaluates condition and trend relative to desired conditions. Validation monitoring tests hypotheses and provides information that might necessitate changes to desired conditions in the plan (e.g., Are the desired conditions in the plan accurate?).

Roles and Responsibilities

The Forest Plan Monitoring Program requires a coordinated effort of many people, from the people who collect the data, to the people who provide feedback and assistance, to the decision maker.

For the purposes of this Plan Monitoring Program, the roles and responsibilities within the Forest Service are defined below.

Regional Office. The Regional Office (http://www.fs.usda.gov/r10) develops regional policies and directives on monitoring and evaluation. In addition, the Regional Office works with the Forests to develop a broader scale monitoring program.

Forest. The Tongass National Forest (http://www.fs.usda.gov/tongass/) implements the Forest Plan and conducts monitoring and evaluation. The responsibilities of the Forest include the following:

- Collecting data and information for implementation, effectiveness, and validation monitoring; and
- Analyzing and interpreting monitoring data and information and reporting monitoring results, conclusions, and evaluation recommendations to the Regional Office, and making these reports available to the public and other agencies.

Pacific Northwest Research Station. The Pacific Northwest Research Station provides scientific and technical expertise to conduct effectiveness and validation monitoring and evaluation relative to specific agreements. The responsibilities of the Pacific Northwest Research Station include advising and assisting the Forest with the following:

- Developing monitoring study plans, including study objectives, sampling designs, methods, quality assurance plans, and budgets in cooperation with the Forest.

- Collecting data and information for effectiveness and validation monitoring (in specific cases relative to agreements with the assistance of the Forest).
- Analyzing and interpreting the data and information relative to specific studies and agreements with the Forest.
- Reporting study results, conclusions, and recommendations to the Forest, and making these reports available to the public and other agencies; and
- Publishing, when appropriate, study results in regional publications, Pacific Northwest Research Station publications, or professional journals.

How Our Plan Monitoring Program Works

Monitoring and evaluation requirements have been established through the National Forest Management Act (NFMA) at 36 CFR 219. Additional direction is provided by the Forest Service in Chapter 30 – Monitoring – of the Land Management Handbook (FSH 1909.12).

The Tongass National Forest monitoring program was updated in May of 2016 for consistency with the 2012 planning regulations [36 CFR 219.12 (c)(1)]. For a copy of the current (2016) monitoring program go to http://www.fs.usda.gov/goto/R10/Tongass/Monitoring. Monitoring questions and indicators were selected to inform the management of resource status and trends on the Plan area and not every plan component was determined necessary to track [36 CFR 219.12(a)(2)]. See the Plan Monitoring Program at http://www.fs.usda.gov/goto/R10/Tongass/Monitoring for discussion on how the monitoring questions were selected to be consistent with the 2012 planning regulations 36 CFR 219.12.

Providing timely, accurate monitoring information to the responsible official and the public is a key requirement of the Plan Monitoring Program. This 2020-2021 biennial monitoring evaluation report for the Tongass National Forest is the vehicle for disseminating this information. Numerous resource reports that respond to one or more Plan monitoring items were used to build this summary report. Those reports are available upon request.

Monitoring Evaluation

Monitoring Activities

The Tongass National Forest Plan Monitoring Program developed in 2008 addressed many of the requirements of the 2012 Planning Rule. The following modifications of the Plan Monitoring Program were primarily adopted to address the gaps between the 2008 program and the 2012 requirements:

The following section is organized based on the eight required monitoring items in the 2012 Planning Rule (36CFR 219.12 (a)(5). The eight required monitoring items (i through viii) and associated monitoring data are described below.1 Select monitoring questions from the 2016 Tongass National Forest Plan Monitoring Program are also described below.

[1] The 2012 Planning Rule, in 36 CFR 219.12 (a)(5), included the following eight requirements: Each plan monitoring program must contain one or more monitoring questions and associated indicators addressing each of the following: (i) The status of select watershed conditions. (ii) The status of select ecological conditions including key characteristics of terrestrial and aquatic ecosystems. (iii) The status of focal species to assess the ecological conditions required under § 219.9. (iv) The status of a select set of the ecological conditions required under § 219.9 to contribute to the recovery of federally listed threatened and endangered species, conserve proposed and candidate species, and maintain a viable population of each species of conservation concern. (v) The status of visitor use, visitor satisfaction, and progress toward meeting recreation objectives. (vi)

For those questions that specifically address a requirement of the rule and are described in the section, How the Tongass National Forest Meets the Requirements of the Rule, above, the reference is appended with the word "Requirement." This includes questions 2, 3, 6, 7, 12, 17, 19, 20, 21, 33, and 34. All of other questions are intended to monitor specific Forest Plan components.

Monitoring Item (i): Status of select watershed conditions

Table 1. Monitoring Questions for Item (i) - Status of watershed conditions

Monitoring Question	Plan Component(s)	Associated Indicators	Data collection interval (dates)	Data Source / Partner
Question 21: What are the ecological conditions and trend 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)?	Protect or restore water quality (SW4)	Effects of management activities on Watershed Condition Class. Number of Watersheds moved to Condition Class 1 (all essential projects completed)	Every 5 years	Watershed condition Framework 5-year assessments.

New Science or Other Information for Item (i)

Monitoring Results for Item (i)

Most of the 914 watersheds within the Tongass are in near-natural condition (Condition Class I). In 2021, the Tongass National Forest performed a five-year reassessment of watershed condition, focusing on 55 watersheds likely to have experienced measurable change in function since the previous assessment in 2016. All watersheds remain 'functioning properly' with a condition score less than 1.7. Fifteen watersheds showed improvement, 36 did not change, and four declined in function since the previous assessment in 2016. Road crossing improvements restored fish passage and road decommissioning contributed to improved watershed condition scores whereas land acquisition and expanded mining

Measurable changes on the plan area related to climate change and other stressors that may be affecting the plan area. (vii) Progress toward meeting the desired conditions and objectives in the plan, including for providing multiple use opportunities. (viii) The effects of each management system to determine that they do not substantially and permanently impair the productivity of the land (16 U.S.C. 1604(g)(3)(C)).

activity led to poorer ratings. Scores also reflect improvements in stream network mapping and improved topographic modeling.

Monitoring Discussion and Findings for Item (i)

Following a review by Tongass staff and stakeholders, the Forest Supervisor established priority watersheds to focus restoration plans and activities. The Tongass completed essential projects in two Priority Watersheds: Iris Meadows (2018) and Staney Creek (2018). Restoration included instream large wood restoration to restore floodplain and stream functions that provide spawning and rearing habitat features critical to freshwater salmon life stages, road storage and decommissioning, aquatic organism passage (AOP), road crossing improvements, and riparian thinning. These projects accounted for a total of 16 miles of streams restored, 37 road crossings improved, and 430 acres of riparian thinned. Spasski Creek was added to the Priority Watershed List in 2019 and 75percent of the proposed restoration actions have been completed. Restoration of Skanaxheen (formerly Saginaw), Luck/Eagle and Margaret Watersheds is ongoing, and expected for completion by the next reassessment in [year].

Table 2. Summary of monitoring evaluation trends for all monitoring questions and indicators in Item (i), Question 21.

Current Status	Trend Towards Target	Trend Away from Target
Within target	51	4
Outside target		

Adaptive Management Considerations for Item (i) - Status of watershed conditions

There is no need to change Forest Plan direction or the Forest Plan monitoring plan for Item (i) - Status of watershed conditions.

Monitoring Item (ii): Status of select ecological conditions including key characteristics of terrestrial and aquatic ecosystems

Table 3. Monitoring information for item (ii) - Status of ecological conditions

Monitoring Question	Plan Component(s)	Indicators	Data collection interval	Data Source / Partner
Question 3: Following young-growth treatments, is the change in understory vegetation providing improved habitat for key old-growth associated species?	Wildlife Habitat Improvement (WILD2, Forest Plan p. 4-93)	Assessment of understory species composition	Annual	Silviculture inventory (FACTS), wildlife inventory, Tongass-wide young-growth study (TWYGS), research studies, GIS, NEPA decisions
Question 6: Are any effects on biodiversity resulting from the cumulative change in the extent of old growth by biogeographic province,	Habitat Planning and Coordination (WILD1.II.B, Forest Plan p. 4-93)	Changes in the amount of old growth in relation to finer scale classification (such as plant association or high-volume strata). Change could include	Annual	Silviculture inventory (FACTS), wildlife inventory, Tongass-wide young-growth

Monitoring Question	Plan Component(s)	Indicators	Data collection interval	Data Source / Partner
and are those effects consistent with the estimates and intent of the Forest Plan?		effects of timber harvest, land conveyance, windthrow, insect and disease, climate change, etc.		study (TWYGS), research studies, GIS, NEPA decisions
Question 7: Are old growth features retained in the matrix consistent with expectations and is it representative of old growth types across value comparison units (VCUs) and across the Forest?	Biodiversity Goals and Objectives (Forest Plan p. 2-3), Wildlife Objectives (Forest Plan p. 2-6)	Amount of retained old-growth structure within managed landscapes (examples include legacy structure, reserve trees, windfirm buffers)	Annual	Silviculture inventory (FACTS), wildlife inventory, Tongass-wide young-growth study (TWYGS), research studies, GIS, NEPA decisions
Question 12: Is the natural range and frequency of aquatic habitat conditions maintained?	Fish Habitat Planning (FISH2.IV and FISH3.I Forest Plan pp.4-10, 4-13)	Compliance with Fish Standards and Guidelines	Annual	Field collected data; Forest-wide databases

Biodiversity Question 3: Following young-growth treatments, is the change in understory vegetation providing improved habitat for key old-growth associated species?

Monitoring Objectives

Maintain ecosystems capable of supporting the full range of native and desired non-native species and ecological processes. Maintain a mix of representative habitat types at different spatial and temporal scales. Maintain a system of old-growth and other forest habitats (includes reserves, non-development LUDs, and beach, estuary, and riparian corridors) to sustain old-growth associated species and resources. Include a young-growth management program to maintain, prolong, and/or improve understory forage production and structure during stem exclusion and to improve habitat conditions, including accelerating development of old-growth characteristics.

Biodiversity Question 6: Are any effects on biodiversity resulting from the cumulative change in the extent of old growth by biogeographic province, are those effects consistent with the estimates and intent of the Forest Plan?

Monitoring Objectives

The effects on biodiversity because of cumulative change in old-growth habitat by biogeographic province will be determined by assessing changes in the amount of potential old-growth habitat. Using a vegetation map in a geographic information system (GIS) and the Forest Activities Tracking System (FACTS) database, we will assess the change in acres of productive old-growth (POG), high volume POG (HPOG), and size density 6 & 7 (large-tree POG, SD67) habitat. This is tracked with timber harvest and land conveyance on National Forest System lands by biogeographic province as compared to those displayed in the 2016 Forest Plan Final Environmental Impact Statement (USDA 2016, tables 3.9-12, 3.9-13, and 3.9-14; pages 3-209-211).

POG, HPOG, and SD67 were identified spatially using the 1954 Size Density cover in the Tongass corporate GIS library joined with harvest data from FACTS. Harvest by all silvicultural systems is except commercial thinning, which does not harvest POG, HPOG, or SD67. The following are definitions of POG, HPOG, and SD67:

POG: Size density classes 4H, 4S, 4N, 5H, 5S, 5N, and 67. This encompasses the commercial size timber across the Forest and ranges from:

> Small to medium diameter (quadratic mean diameter [QMD]<21 inches) trees occurring at various densities and of volume class 4 (8 to 20 MFG/acre) and where tree diameters greater than 40 inches are generally rare to large diameter (QMD >21 inches) trees occurring at low density (SDI <280) of volume class 6 or 7 (>30 MBF/acre) and where tree diameters greater than 40 inches are common and well distributed throughout the stand

HPOG: Size density classes 5S, 5N, and 67. This is a subcategory of POG that only includes the stands where tree diameters are commonly larger than 40 inches but may be patchily or uniformly distributed.

SD67: This includes only the 67-size density class of stands for which tree diameters are commonly larger than 40 inches and are well distributed throughout.

Biodiversity Question 7: Are old growth features retained in the matrix consistent with expectations and is it representative of old growth types across value comparison units and across the Forest?

Monitoring Objectives

We focus this monitoring on annual implementation of the legacy standards and guidelines as well as residual tree and patch retention measures and goshawk nest habitat protections. The amount of protected old growth in the matrix is influenced by the implementation of the legacy standard and guideline (WILD1.IV), retention of patches and individual trees in two aged harvest (TIM4 IV 2), and goshawk nest habitat buffers (WILD4 II A 1 c). The intent of legacy is to ensure that sufficient residual trees, snags, and clumps remain in areas with past concentrated timber harvest. The retained patches and residual trees will provide support for those organisms that require old forests. Goshawk nest habitat buffers are protected in perpetuity and preserve productive old growth nesting habitat around all known goshawk nest sites.

Biodiversity Question 12: Aquatic Habitat Streams and Fish Habitat Question: Is the natural range and frequency of aquatic habitat conditions maintained?

Monitoring Objectives

Upstream migration is essential for many fish species in the Tongass National Forest. 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 an important consideration when constructing or reconstructing forest roads. Improperly located, installed, or

maintained stream crossing structures can restrict these migrations, thereby 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.

The Tongass National Forest strives to incorporate an adaptive management process to achieve the desired management goals and objectives for the fish passage at road crossings program. The adaptive management approach includes a continuous process of using, or developing, state-of-the-art assessment and restoration techniques followed by monitoring and adjustment of the techniques, accordingly.

The Tongass National Forest has identified and surveyed 3,619 fish stream road crossings along approximately 5,000 miles of forest roads. Not included in this total are 122 fish stream crossings that were previously on Forest Service roads but have been converted to State Highway on Thorne Bay and Petersburg Ranger Districts which the State now has jurisdiction over. Thirty-seven percent of the 3,619 crossings are anadromous, and 63 percent are resident fish streams. Approximately 53 percent of the crossings are culverts and 47 percent are bridges or removed structures. Approximately 98 percent of the crossings have had fish passage determinations completed and 32 percent of those have been determined not to meet State of Alaska fish passage standards. There is an average of 0.33 miles and a median of 0.17 miles of fish stream habitat length upstream of the anadromous crossings which includes resident sections above the anadromous reach and an average of 0.19 mile and a median of 0.11 miles upstream of the resident crossings that are not meeting passage standards.

Fish Passage Standards and Guidelines including drainage-structure-design-criteria have evolved over time and are still evolving as information on fish swimming performance, fish movement patterns and culvert hydraulics is improved. Therefore, the assessment of the effectiveness of the Standards and Guidelines contained in the Forest Plan can only be meaningfully conducted on drainage structures more recently designed and installed.

Between 1998 and 2021, the Tongass has re-installed, retrofitted, or removed approximately 653 crossings that were previously not meeting passage standards in fish streams and potentially impeding fish passage. Also not included in this number are recently replaced crossings that were previously not impeding fish passage or culverts installed on streams that did not previously have a crossing structure. Two-hundred and eighty eight of the 653 were remediated by removal and 365 were reinstallations or required maintenance. The estimated cost of this remediation is $27.2 million, indexed to 2021 dollars. Approximately 76 percent of the reinstallations were replaced with culverts, 19 percent were replaced with bridges, and 4percent were retrofits or maintenance occurred. Remediation of these fish passage barriers has improved access to approximately 222.6 miles of upstream fish habitat out of [blank] miles that were impeded. Approximately 102.5 miles are located on Class I and 120.1 miles located on Class II. The monitoring provided in this report includes all installations on fish streams but excludes bridges and structures that have been removed, unless maintenance occurred, because these crossing types do not routinely impede fish passage.

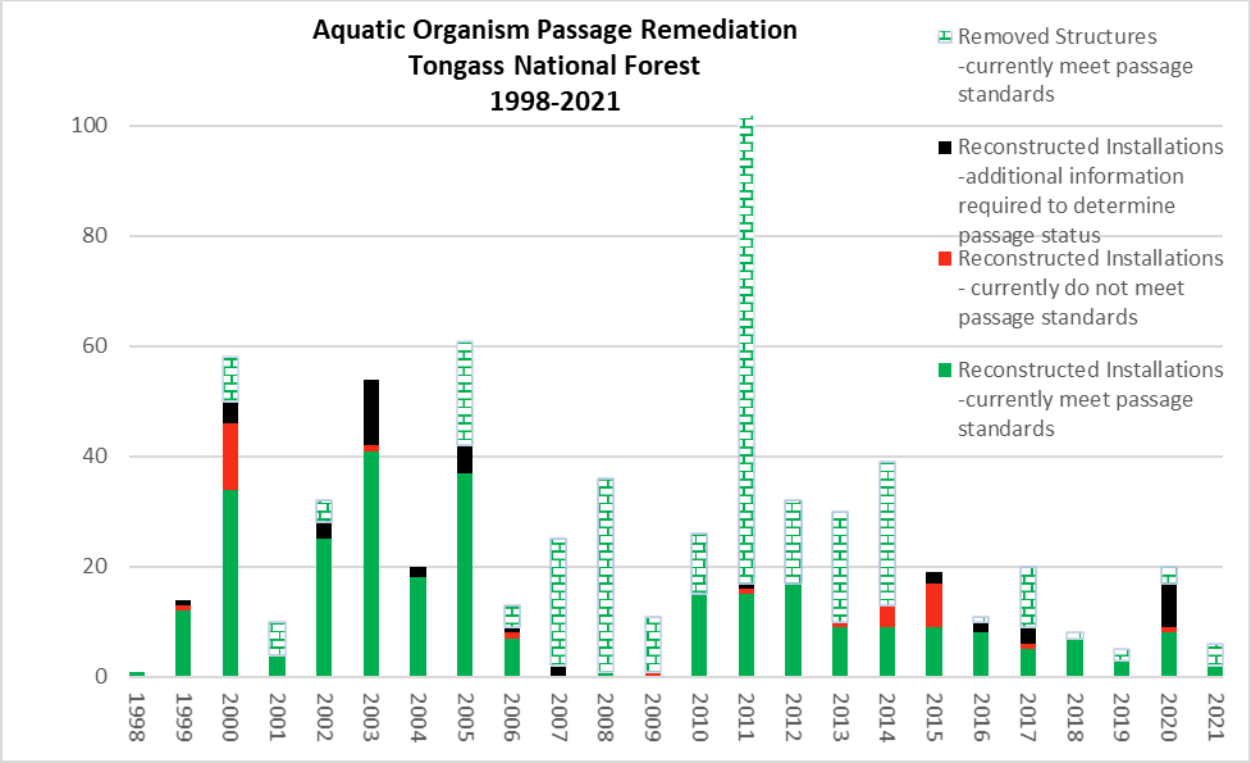

Figure 1: Aquatic organism passage remediation on the Tongass National Forest 1998-2021

The culverts were primarily assessed using criteria established in the USFS Alaska Region Juvenile Fish Passage Assessment Matrix. The matrix separates out culverts that have conditions that can be assumed to meet standards from those that do not. The evaluation matrix stratifies culverts by type and establishes criteria thresholds for culvert gradient, stream constriction, debris blockage, and vertical barrier at the culvert outlet (perch) specific to each culvert type. Each culvert is placed into one of the five juvenile fish-passage capability categories.

New Science or Other Information

Question 3:

HNFP Research (2018-present): Estimate response in deer and deer habitat following second growth treatments (i.e., thinning).

- What is the effect of different precommercial thinning treatments on deer density? To gain insight into this question, they selected stands thinned at different ages and tree spacings. Within those stands crews collected genetic material from fresh deer-pellet piles. The DNA will give the genotype of the individual that deposited it. By knowing the unique genotype of an individual animal, we can estimate deer density within in a particular stand.
- How does specific silviculture prescription relate to coarse woody debris volume? To look at this, crews are collecting data on stand characteristics and coarse woody debris volume. These measurements collected in the plots sampled for deer densities to tie the two surveys together and understand the relationship.

Wildlife Young-growth Strategy (2020): This document aids in integrating young-growth management for wildlife with other resource goals introduced in the broader Tongass Young-Growth Management Strategy (USDA 2015).

- Broader complimentary themes include integrating common goals, managing the system to meet multiple objectives, developing a common language and mutual understanding, focusing on young growth to support the conservation of old growth, and using the young-growth strategy to set priorities.
- This strategy provides guidance for young-growth management to benefit Tongass wildlife species, detailing how, where, and when work should be prioritized and implemented given limited resources. Synopses of management direction, the natural scale and distribution of disturbance, key habitat characteristics, and relevant effectiveness literature from the Tongass and Pacific Northwest rainforest ecosystems provide the basis. This exhibit offers value at multiple levels, including in programmatic, project, and collaborative planning, conducting effects analyses, and guiding implementation.

Effects of understory biomass and Forage

Crotteau, J. S., Rue-Johns, A. Z., & Barnard, J. C. (2020). Effects on understory biomass and forage 8–10 years after precommercial thinning of Sitka spruce–western hemlock stands in southeast Alaska. *Canadian Journal of Forest Research*, *50*(2), 215-225.

- Stand density negatively affected understory biomass, whereas temperature and precipitation positively interacted to increase biomass. Thinning had an enduring effect on understories, with biomass at least twice as great in thinned versus unthinned stands through year 10.

Discussion of Tongass wide young-growth study (TWYGS): Reports finding from 16 years of measurement in the first four TWYGS studies.

Crotteau, Justin S., et al. 2020. Sharing the load to develop young-growth silviculture for forage and biodiversity in southeast Alaska. In: Pile, Lauren S., et al. The 2019 National Silviculture Workshop: a focus on forest management research partnerships. Gen Tech. Rep. NRS-P-193. Madison, WI: U.S. Department of Agriculture, Forest Service, Northern Research Station: 170-192.

- Reveals long-term understory dynamics following treatments designed to simultaneously develop timber and deer forage, and notably demonstrates the long-lasting, biologically significant benefits of thinning on understory development.
- 16-year analysis of TWYGS Experiment 2, precommercial thinning in 15- to 25-year-old stands, revealed that understories behaved dynamically following treatment, but generally followed a predictable pattern, and differences between treatments were relatively stable over time.
- Understory biomass and deer forage decreased with time since thinning. Understory biomass in thinned stands was still significantly greater than in unthinned stands.

Question 6 and 7 (What is the Question? Please restate it here):

No new science or new information applicable.

Question 12 (What is the Question? Please restate it here)

The 2017 land exchange changes to the Forest LUDS did not become final until 2022. These will be reported in the next monitoring report cycle and will include additions to Small OGRs throughout the Forest. There have been no changes to the associated indicators during the 2020 and 2021 monitoring periods.

Monitoring Results

The following results reflect updates from data collected in FY 2020 and FY 2021. New information collected or compiled from the last evaluation report FY 2019 has been incorporated.

Data

Question 3 (What is the Question? Please restate it here):

The Tongass has been working to improve the value of young growth stands for wildlife and to improve their value for future harvest. This was carried out using a wide variety of pre-commercial thinning under the guidance of the Tongass Young Growth Management Strategy (USDA 2015). Some of the goals 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 TWYGS.

Table 4: Young growth stand improvements (acres treated) for FY20 and FY21 derived from the FACTS database.

Treatment Type	FY20	FY21	Total
Precommercial Thin	2589	1364	3953
Commercial Thin	31		31

Question 6

Table 5: Acres of POG, HPOG, and SD67 harvested during FY2020 across biogeographic provinces

Biogeographic Province	POG	HPOG	SD67
North Prince of Wales	113	5	5
Total	**113**	**5**	**5**

Table 6: Acres of POG, HPOG, and SD67 harvested during FY2021 across biogeographic provinces

Biogeographic Province	POG	HPOG	SD67
North Prince of Wales	55	7	
Total	**55**	**7**	

Question 7:

Table 7: Timber sales within applicable legacy retention VCUs for 2021 in relation to harvest. There was no applicable legacy in 2020.

Timber Sale with Legacy	Legacy VCU	Original Stand > 20 Acres	Legacy Retained	Legacy Description
Rio Beaver	5972	Yes	N/A - Less than 20 acre cut	N/A
Big Thorne Stewardship	5972	Yes	Yes	Wildlife leave trees in clumps

Table 8: Acres of residual old growth trees in matrix lands from young-growth stands with prior two-aged, residual tree, patch clearcut harvest method. There has been no loss of residual trees from young-growth harvest in FY20 and FY21.

Residual POG in Matrix	Residual POG in Young Growth
3,919	8,543

Table 9: Total Northern Goshawk buffers and acres in matrix lands on the Tongass. Eight buffers were added in FY20 and FY21.

Number of Goshawk Buffers in Matrix Lands	Acres of Goshawk Buffers in Matrix Lands
58	7,899

Question 12:

As part of this multi-year monitoring project, five culverts spanning fish streams were monitored in 2021 to assess their ability to provide fish passage. No monitoring occurred in 2020 due to COVID-19 related travel restrictions. These five culverts were chosen from 291 culverts which have been installed, reinstalled, or retrofitted in fish streams between 1998 and 2021. The culverts monitored in 2021 were located on Prince of Wales Island. The 263 unique stream crossings monitored to date as part of this assessment constitute approximately 90 percent of the culverts recently installed, reinstalled, or retrofitted in fish streams on the Tongass National Forest.

Eighty percent of the culverts monitored to date are within the target or outside the target but trending towards the target and have met the acceptable passage criteria established in the juvenile fish passage criteria matrix. The monitored culverts are consistent with State of Alaska juvenile fish passage standards and are assumed to provide unimpeded juvenile and adult fish passage. Seven percent of the culverts require more comprehensive analysis to determine passage status. The remaining 13 percent are Red and are assumed not to provide adequate passage at all desired stream flows. The majority (66 percent) of the 263 stream crossings monitored were installed between 2000 and 2005.

Fifty-five percent of the monitored culverts used stream simulation designs, 11 percent were installed using a simplified stream simulation (SSS)design, 2 percent are hydraulic designed, 18 percent utilized a no-slope design, 3 percent were retrofits, and 11 percent were incorrectly designed without adequate fish passage considerations. Three percent of the stream simulated designed culverts are Red. Seventeen percent of the SSS designed culverts are Red. None of the 47 installed no-slope designed culverts are Red. One of the retrofits is Red but needs re-evaluation. All five of the hydraulic designed culverts require additional more comprehensive analysis to determine passage status. Twenty-nine culverts were installed without discernable fish passage design considerations and as a result 24 (83percent) are Red (Figure 2).

Figure 2: Before and after picture of recently replaced red pipe that was monitored in 2021. Looking downstream at culvert inlet.

Of the culverts that were determined to be consistent with passage standards, most were ideal installations. They contained appropriate bedload depth and material, were not blocked with debris, were not perched at the outlet, and did not constrict the channel or cause any undesirable channel modifications.

What is the status and trend of the monitoring indicator in relation to the target? The trend is all indicators are trending towards applicable targets for wildlife.

Table 10. Summary of monitoring evaluation trends for all monitoring questions and indicators

Current Status	Trend Towards Target	Trend Away from Target
Within target	66 percent	
Outside target		13 percent

Monitoring Discussion and Findings

Question 3:

We demonstrate that precommercial thinning is a useful intermediate treatment to coproduce deer forage and timber in young-growth stands. Other treatments such as girdling, pruning, small gap creation, and radial tree release along with unthinned corridors and patches have also proven to be beneficial for understory vegetation. This does not demonstrate whether the forage is accessible, especially during winter because of slash accumulation and lack of snow interception. Best science suggests that heavy slash loads can have negative impacts on young deer survival (Farmer et al. 2006). However, when slash is cut at a smaller diameter (e.g., < 5” dbh) deer can occupy the stands within a few years (J. Martin and T. Brinkman unpublished data). Snow interception from intact canopies can be important during heavy snow winters.

Question 6:

The transitioning of harvesting old growth to young growth will positively affect POG as fewer acres of POG will be harvested. It is predicted in the 2016 Forest Plan EIS based off predicted harvest that in 25 years there will only be a one percent reduction in POG across the Tongass. The amount of old growth harvest reported in FY 20 and FY 21 is below these predicted levels.

The effects on biodiversity shown through the cumulative change in old growth by biogeographic province are consistent with the estimates of the Forest Plan. As predicted in the EIS for the 2016 Forest Plan, the greatest effect to biodiversity associated with the removal of POG would be in the biogeographic provinces listed in tables 6 and 7 The most acres harvested came out of North Central POW.

Question 7:

Much of the timber harvest on the Forest since implementation of the 2016 Forest Plan occurred outside of high risk value comparison units (VCU). Where harvest did occur in high-risk VCUs, much of it was exempted from application of the legacy standards and guidelines because of the harvest method used (single tree selection) and harvest of less than 20 acres within Legacy VCU. Retention of residuals and patches in two aged young growth stands will also be beneficial in the future as this measure gets applied to young growth harvest. The number of acres protected in goshawk nest buffers will remain in perpetuity and will provide additional old growth features within the matrix. The old-growth structure retained in the matrix is adequate and representative of old-growth types across the Forest. Between the reserve system and the standards and guidelines that apply to the development land use designations, the Forest Plan protects 88 percent of productive old-growth habitat on the Tongass. Although 11.9percent of productive old-growth forests have been logged region wide, large-tree stands have been reduced by at least 28.1, and landscapes with the highest volume of contiguous old growth by 66.5percent (Albert and Schoen 2013).

Question 12:

Thirty-four (13 percent) of the 263 culverts monitored to date and assessed via the Alaska Region juvenile fish passage criteria matrix do not meet State of Alaska passage standards (Red) and may to some extent impede the passage of juvenile fish. The 34 crossings determined not to be consistent with juvenile passage standards can be generally attributed to several different reasons.

1. Seventeen of the 34 red culverts were known fish stream crossings requiring passage considerations but were installed without fish passage design considerations due to project personnel apparently being unaware of aquatic passage objective.
2. Seven 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. Five of the culverts not meeting juvenile passage standards are SSS designed culverts and have not accumulated enough bedload within them to provide adequate roughness and moderate water velocity or were undersized and constricting the channel. These culverts will potentially continue to accumulate bedload over time.
4. One of the red culverts is a stream simulated designed culvert that has sections completely scoured free of bedload.
5. One stream simulated culvert is not providing adequate passage because it is blocked by woody debris.
6. One stream simulated culvert was not installed per plans so there is a lack embedment depth and substrate at inlet causing it to be Red for gradient. This culvert is likely providing adequate passage now but will need frequent re-inspections to monitor that it is not losing bedload due to gradient and lack of embedment at inlet.

7. One stream simulated open bottom culvert that was installed in 2000 has had scour around the concrete footers creating a perch at the outlet.
8. One culvert is Red after being retrofitted with a structure placed near the outlet to backwater the culvert. The entire culvert is not backwatered at this site and re-evaluation is needed since the last survey occurred in 2001.

Adaptive Management Considerations

We do not recommend any changes to Forest Plan standards and guidelines in response to preliminary monitoring results.

Recommended actions:

1. Continue to monitor all new and recent culvert installations in fish streams.
2. Ensure that appropriate sampling occurs on any potential fish stream where culvert replacements are to occur early in the planning stages and prior to contract preparation.
3. Provide implementation training to contracting officer representatives (CORs) to ensure proper installation of fish passage structures occur per design specifications.
4. Ensure utilization of Fish Passage Project Inspection Checklist for all aquatic organism passage (AOP) installations.
5. Continue using a Tongass AOP interdisciplinary team design for new fish crossing survey, design, and for review of completed designs.

Monitoring Item (iii): The status of focal species to assess the ecological conditions required under § 219.9

Focal species have not yet been identified for the Forest, therefore there is nothing to report on the status of focal species.

Monitoring Item (iv): The status of a select set of ecological conditions required under § 219.9 to contribute to the recovery of federally listed threatened and endangered species, conserve proposed and candidate species, and maintain a viable population of each species of conservation concern.

Table 11: Monitoring information for item (iv)

Monitoring Question	Plan Component(s)	Indicators	Data collection interval	Data Source / Partner
Question 17: Is current management providing for ecological conditions to support federally listed threatened or endangered species, and Alaska Region sensitive species?	Threatened, Endangered, and Sensitive Plants and Wildlife Species (PLA1 and WILD4, Forest Plan p. 4-39 and 4-94)	Changes in habitats for listed threatened or endangered species and Alaska Region sensitive species; changes to listed species or critical habitat; biological evaluation findings / number of consultations; mitigation measures implemented / number of populations located	Annual	Wildlife inventory and monitoring; population trend data from various sources (ADF&G, Breeding Bird Survey, Alaska Landbird Monitoring); TNF Rare Plant surveys; project BE/BA analyses; NEPA documents – review mitigation measures and S&G implementation; GIS

Monitoring Objectives

We summarize the effects determinations made in fiscal year 2020 and 2021 to fulfill the section 7 (a)(c) of the Endangered Species Act mandate. In the case of the Queen Charlotte goshawk, we also report the implementation of goshawk nest surveys. See the Biodiversity Question 7 for a report of the implementation of the legacy standard and guideline.

New Science or Other Information

No new science or information collected outside of this monitoring program was considered in the evaluation of this monitoring question.

Monitoring Results

The following results reflect updates from data collected for FY 2020 and FY 2021. New information collected or compiled from the last evaluation report FY 2019 has been incorporated.

Data

Table 12: The number of proposed projects on the Tongass National Forest in FY2020,21 for which the biological assessment made a "may affect but not likely to adversely affect", and "likely to adversely affect" determination for federally listed species.

Determination	Threatened and Endangered Species					
	Humpback Whale Mexico DPS	Steller Sea Lion Western DPS	Short-tailed Albatross	Sperm Whale	Fin Whale	Fish Species
May affect, not likely to adversely affect	2	1	0	1	0	1
May affect, Likely to adversely affect	0	0	0	0	0	0

Table 13: The number of proposed projects on the Tongass National Forest in FY2020/21 for which the biological evaluation made a "may adversely affect individuals but not populations" and "likely to result in loss of viability" determination.

Determination	Sensitive Species				
	Queen Charlotte Goshawk	Black Oystercatcher	Kittlitz's Murrelet	Aleutian Tern	Dusky Canada Goose
May adversely affect individuals, but not likely to result in loss of viability in the planning area, nor cause a trend toward Federal listing	10	2	0	0	0
Likely to result in a loss of viability in the planning area or in a trend toward Federal listing	0	0	0	0	0

Table 14: Surveys conducted for Sensitive Species for FY2020/21 across the Tongass

District	Survey Type	Targeted Sensitive Species	FY	Sensitive Species Detections N=Nest, I=individual
Ketchikan-Misty Fjords	Biological Acoustic Survey	Queen Charlotte Goshawk	20,21	1-I
Prince of Wales	Biological Acoustic Survey	Queen Charlotte Goshawk	20,21	6-I 1-N
Petersburg	Biological Acoustic Survey	Queen Charlotte	20,21	1-N
Yakutat	Visual	Aleutian Tern	20,21	

What is the status and trend of the monitoring indicator in relation to the target?

Table 15. Summary of monitoring evaluation trends for all monitoring questions and indicators

Current Status	Trend Towards Target	Trend Away from Target
Within target	All	0
Outside target	0	0

Monitoring Discussion and Findings

The Forest Service activities that result in "may affect" determinations are related either to potential disturbance associated with the connected actions of marine traffic (acoustic disturbance and increased potential for vessel strikes) and log transfer facility (LTF) reconstruction activities (possibility of acoustic disturbance and pollution). Forest Plan standards and guidelines direct the Tongass to prevent and/or reduce potential harassment of Steller sea lions and humpback whales due to activities carried out by or under the jurisdiction of the Forest Service

None of the projects had significant impacts on threatened and endangered species and did not require formal consultation with NMFS and USFWS. None of the projects had adverse effects on populations of sensitive species that could lead to federal listing.

Adaptive Management Considerations

None

Monitoring item (v): The status of visitor use, visitor satisfaction, and progress toward meeting recreation objectives

Recreation on our National Forests is more than just camping, fishing, and hiking. Research has shown that people choose a specific setting for each of these activities to realize a desired set of experiences. For example, camping in a large undeveloped setting with difficult access and few facilities offers a sense of solitude, challenge, and self-reliance. In contrast, camping in a setting having easy access and

highly developed facilities offers more comfort, security, and social opportunities. The Recreation Opportunity Spectrum (ROS) offers a framework for understanding these relationships and interactions. The Forest Plan includes seven ROS classes: Urban (U), Rural (R), Roaded Modified (RM), Roaded Natural (RN), Semi-primitive Motorized (SPM), Semi-Primitive Non-Motorized (SPNM), and Primitive (P). Maintaining a broad spectrum of these classes provides people with choices. There are seven indicators that have been identified from research on visitor preferences that are used to help determine the possible effects on ROS settings from project implementation. The indicators are access, remoteness, visual characteristics, site management, visitor management, social encounters, and visitor impacts.

The Tongass National Forest maintains two large visitor centers, 189 cabins and shelters, more than 460 miles of non-motorized trails, and more than 500 miles of motorized trails for use by local residents and visitors. Along with this infrastructure, recreation use of the Tongass National Forest is facilitated through outfitters and guides. These services range from accommodation of transport to cabins and shelters, to multi-day big game hunting experiences in the most remote locations of the Tongass National Forest.

Table 16: Monitoring questions for item (v) - Meeting recreation objectives

Monitoring Item	Plan Component(s)	Associated Indicators	Data collection interval (dates)	Data Source / Partner
Question 33: Are areas of the Forest being managed in accordance with the Recreation Opportunity Spectrum (ROS) class in Forest-wide standards and guidelines?	Recreation Use Administration (REC3 I, II, III, Appendix I, Forest Plan pp. 4-43 to 4-45, I-1)	Compliance with Forest Plan guidelines, including those specific to numbers of encounters allowed in each LUD / ROS class.	Annual	Recreation inventory and monitoring; ROS updates in GIS National Visitor Use Monitoring (NVUM) Program
Question 34: What is the status and trend of visitor use and satisfaction?	Recreation and Tourism Goals and Objectives (Forest Plan p. 2-4)	Annual Visitation Estimates, Percent Satisfied, Site Types visited, Distance Travelled.	5 years	National Visitor Use Monitoring (NVUM) Program

New Science or Other Information

Question 33:

No new science or information collected outside of this monitoring program was considered in the evaluation of this monitoring question.

Question 34:

No new science or information collected outside of this monitoring program was considered in the evaluation of this monitoring question.

Monitoring Results

Question 33:

The following results reflect updates from data collected in 2020/21. New information collected or compiled from the last evaluation report in 2019 has been incorporated.

ROS settings are routinely considered and evaluated in project planning across the forest. There is one project with proposed changes to ROS setting, Mendenhall Glacier Visitor Facility Improvement Project.

The Tongass has typically monitored the amount of permitted outfitter/guide use, the number and development scale of provided developed recreation facilities and trails, the number and condition of non-developed recreation sites in wilderness and social encounter monitoring within wilderness to address this monitoring item.

Outfitters and Guides

Due to continued database transition 2020 and 2021 outfitter/guide counts are not available currently. Guides provided nature touring, hiking, flightseeing, wildlife viewing, freshwater fishing, wilderness adventures, and big game guiding. Currently, this use is authorized through existing environmental analysis that is consistent with the Forest Plan direction for providing a level of commercial uses appropriate to the capacity.

Developed Recreation Facilities and Trails

The Tongass maintains 341 developed recreation sites across the Forest. These include 35 boating sites/buoys, 21 campgrounds (7 fee/14 no fee), 7 camping areas, 4-day use areas, 1 group campground, 2 group picnic sites, 2 information sites, 6 interpretive sites, 2 major visitor centers, 2 minor visitor centers, 189 cabins/shelters, 34 picnic sites, 1 swimming site, 23 trailheads, and 12 wildlife viewing sites. The Tongass manages more than 460 miles of hiking trails, of which almost 92 miles of trail are within congressionally designated wilderness. Another 500 miles of motorized trails are identified on district motor vehicle use maps that are updated annually and available at the local district offices.

In 2013, the Tongass completed an environmental assessment to determine whether to remove 12 cabins. Nine cabins have been removed, one converted to a shelter, one has a partnership agreement, and one has yet to be removed.

In 2018 a sustainable cabin group was put together to once again evaluated the cabin system on the Tongass. A sustainable cabin strategy was completed in 2020 that lays out objectives 10-15 years into the future through new cabin construction, relocation, and decommission.

In 2020 the Great American Outdoors Act became law, and it is helping public land managers fix existing infrastructure such as roads, trails, campgrounds, and day use sites in support of use and enjoyment of public land. Some projects include an increase in infrastructure at existing sites and potentially higher trail class on some trails.

In 2022 the Bipartisan Infrastructure will provide $14.4 million to help fund a mixture of new and reconstructed cabins and cabin repairs and operations on the Chugach and Tongass National Forests.

Future monitoring reports may include the outcome of these funding bills.

Non-developed Recreation Sites

Approximately 550 non-developed recreation sites have been previously recorded within Tongass National Forest wilderness areas. Monitoring of non-developed recreation sites within Misty Fjords National Monument, South Baranof, and West Chichagof-Yakobi Wilderness Areas took place in 2020 and 2021. Monitoring likely occurred in other wilderness areas but were not reported at the time of this report.

Social Encounter Monitoring

Social encounter monitoring took place in 2020 and 2021 within Misty Fjords National Monument, South Baranof, and West Chichagof-Yakobi Wilderness Areas. Monitoring likely occurred in other wilderness areas but were not reported at the time of this report. Social encounter monitoring numbers were not available for 2020 and 2021 at the time of this report.

Question 34:

The following results reflect updates from data collected in 2020/21. New information collected or compiled from the last evaluation report in 2019 has been incorporated.

Annual Visitation Estimates

Total estimated national forest visits increase from round 2 to 3 and took a slight decrease in round 4. The other change that occurred between round 3 to 4 is the confidence level went from ~5percent to ~9percent, meaning is could have been either a larger or smaller decrease, but still a decrease to some extent. Both confidence levels would show a good survey design, so it is less likely a factor in the change. The only site type that does not follow that trend with high confidence levels is General Forest Area (GFA).

Percent Satisfied

There is not a lot of fluctuation in precent satisfaction from round 2-4 apart from wilderness. Wilderness is one of the most challenging visit types to survey for due to the way people primarily access through boat or plane. Over the three rounds the confidence levels range from ~19percent-~35percent, which is a large range especially when looking at the small subset of surveys done for this visit type. The other trend is a decrease in services in developed sites and feeling of safety in GFA from round 3 to 4.

Distance Travelled

The main changes found in distance travelled is for the 500+ and 0–25-mile categories. This would represent residents vs. visitors. While the percentages changes in each round, the majority of visitation was by residents except for round 4, where there is small majority of visitors coming from 500+ miles away.

Data

Question 33:

Outfitter and Guide Use

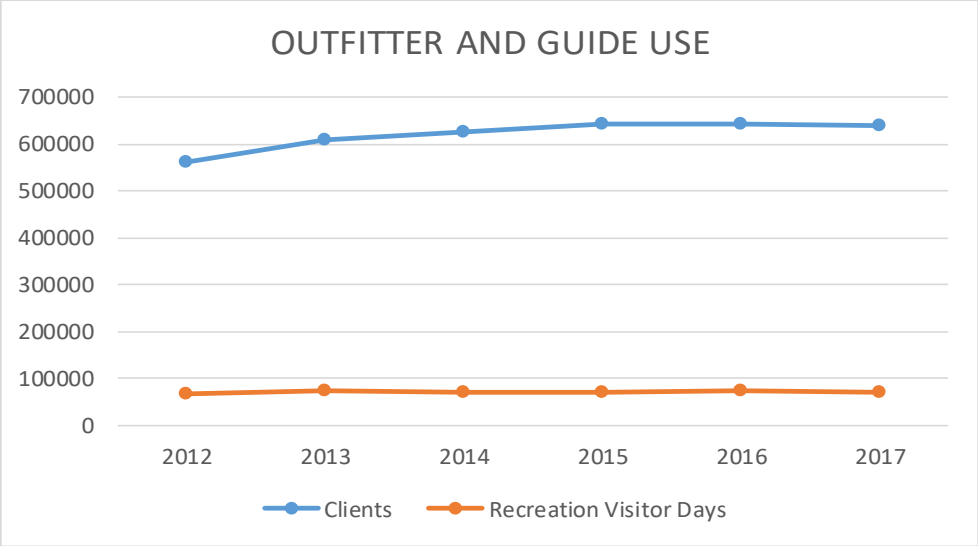

Figure 3: Outfitter and guide use trend since FY12

Outfitter and Guide use on the forest shows a level trend. No areas permitted for outfitter/guide use were reported as exceeding the established ROS class.

Developed Recreation Facilities and Trails

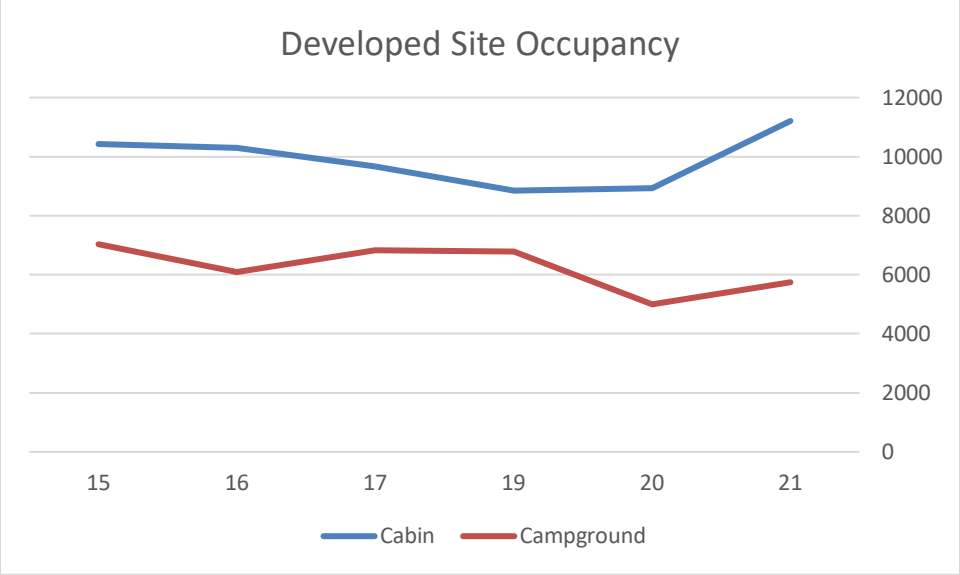

Figure 4: Developed site occupancy since 2015 and trendline

Developed recreation sites show a gradual decline with an increase in 2021 likely associated with COVID-19 visitor use trends. 2018 data is not used due to a lapse in reliable data. No areas were reported as exceeding the established ROS class.

Non-developed Recreation Sites

The monitoring reports that were sent for 2020 and 2021 indicate that sites are meeting the ROS class with most sites having low impact and indicates within wilderness, encounters continue to meet ROS class guidelines, but influences from outside the wilderness area (boats and airplanes) continue to

impact the visitor experience. Overall, social encounters are well within the primitive ROS class. While no report was supplied for the Chuck River, Kootznoowoo and Tracy Arm-Fords Terror Wilderness areas, earlier monitoring shows that along marine travelways and under flight routes the ROS class being met is closer to Roaded Modified. It is possible that with COVID-19 impacts in cruise ship industry influenced these encounters temporarily.

Question 34:

Annual Visitation Estimates

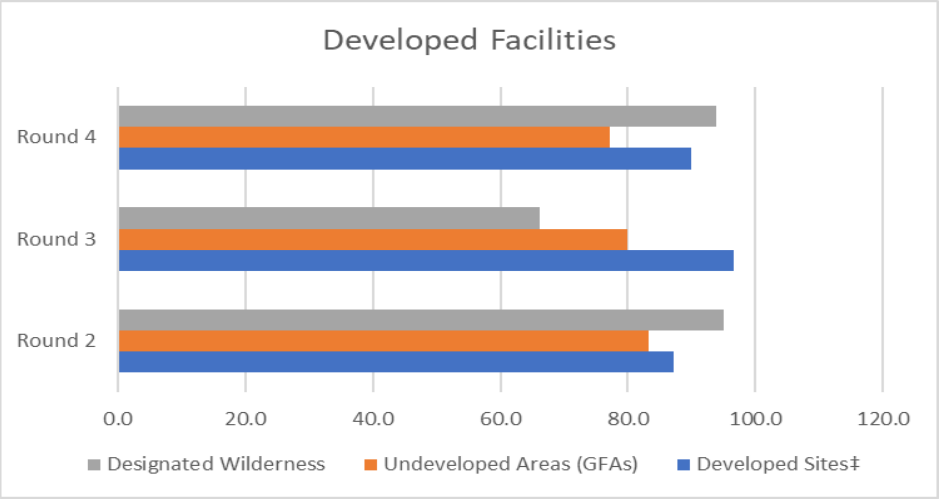

Figure 5: Annual visitation by facility type in FY20 and FY21

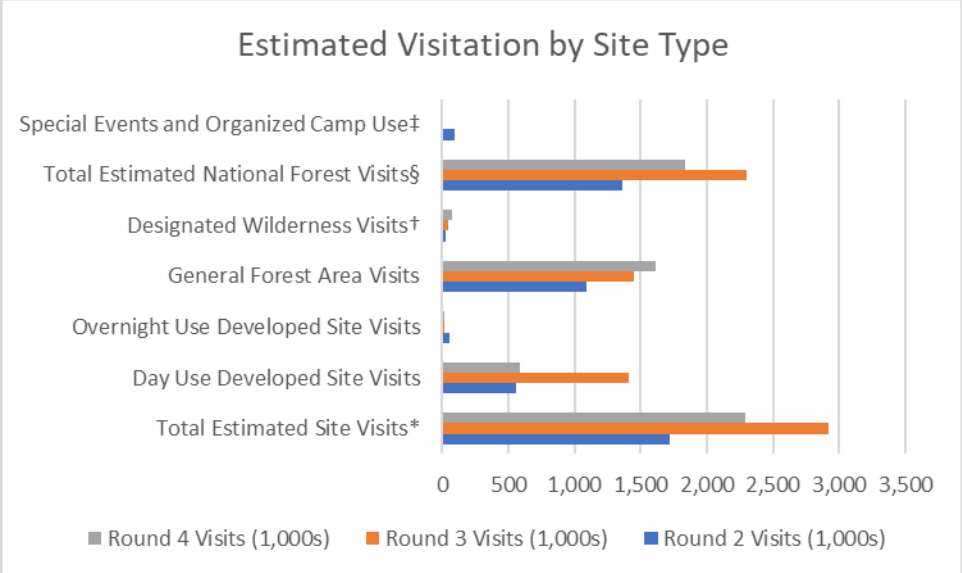

Figure 6: Estimated Visitation by Site Type for FY20 and FY21

A Site Visit is the entry of one person onto a National Forest site or area to participate in recreation activities for an unspecified period of time.

† Designated Wilderness visits are included in the Site Visits estimate.

‡ Special events and organizational camp use are not included in the Site Visit estimate, only in the National Forest Visits estimate. Forests reported the total number of participants and observers, so this number is not estimated; it is treated as 100percent accurate.

§ A National Forest Visit is defined as the entry of one person upon a national forest to participate in recreation activities for an unspecified period of time. A National Forest Visit can be composed of multiple Site Visits.

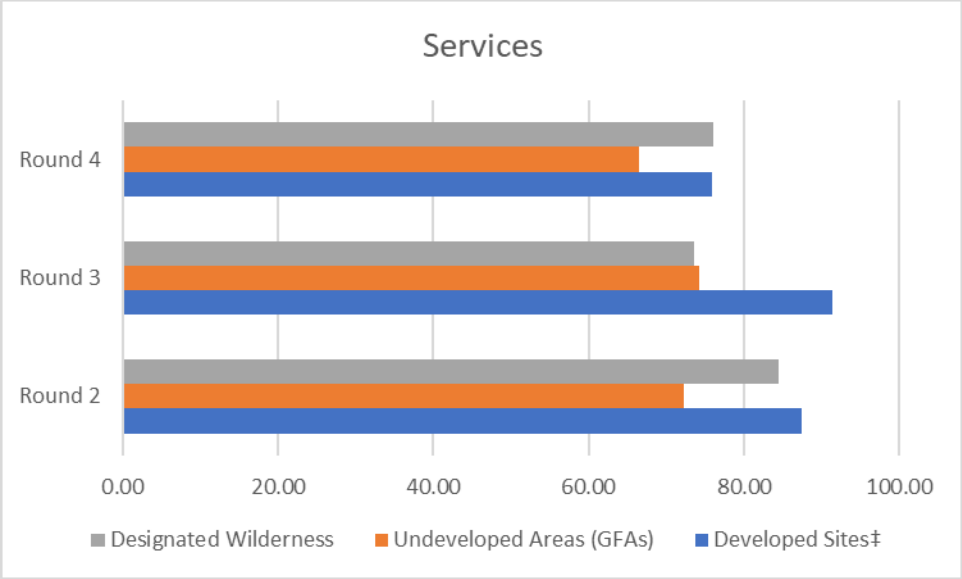

Figure 7: Percent of visitors satisfied with services and access

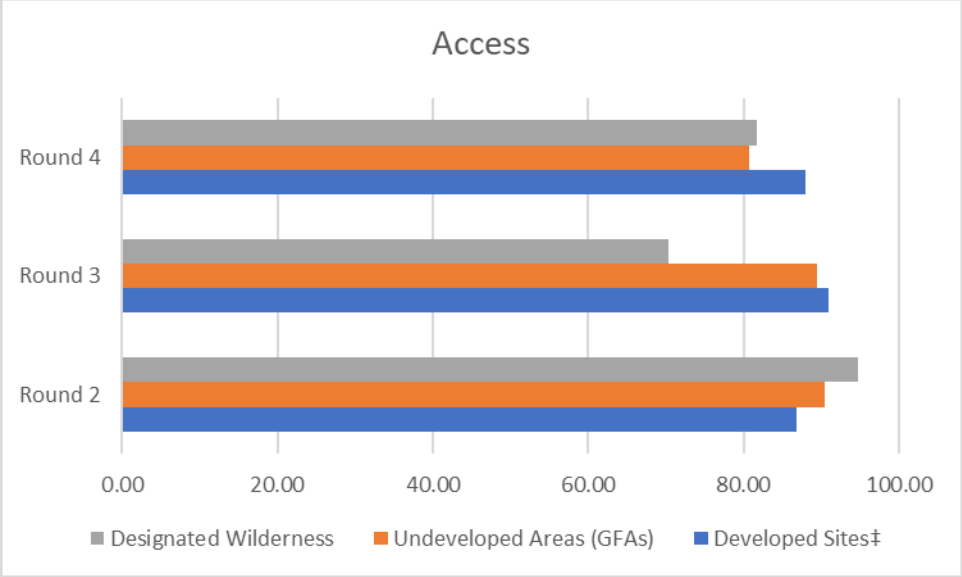

Figure 8:Percent of visitors satisfied with services and access

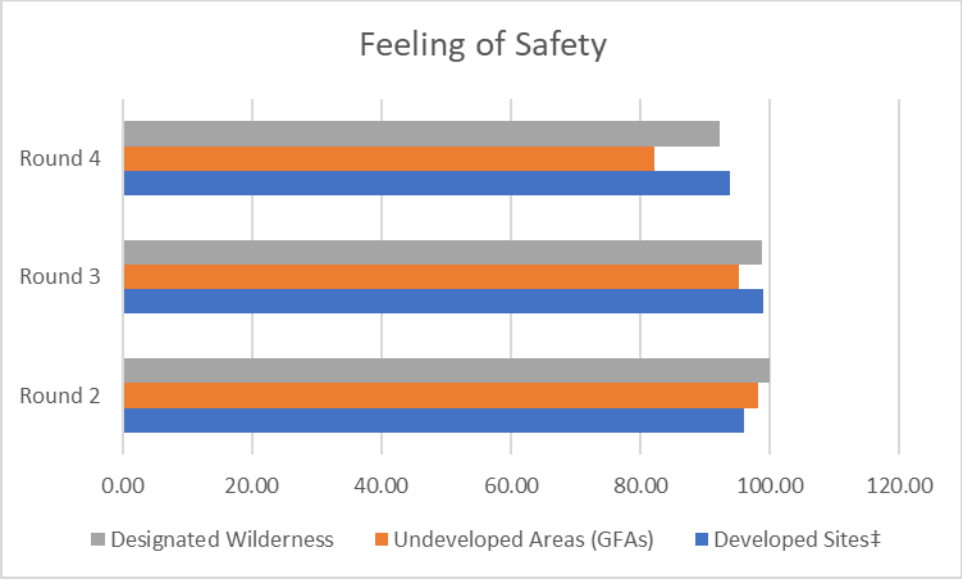

Figure 9: Percent of visitors satisfied with the feeling of safety.

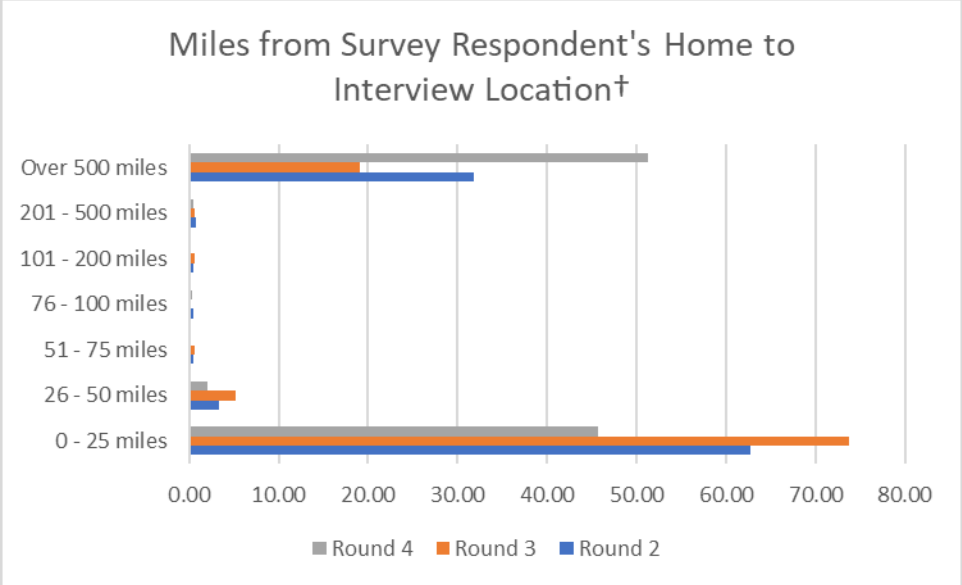

Figure 10: Distance traveled in miles from survey respondent's home to interview location.

Travel distance is self-reported.

What is the status and trend of the monitoring indicator in relation to the target?

Table 17. Summary of monitoring evaluation trends for all monitoring questions and indicators

Current Status	Trend Towards Target	Trend Away from Target
Within target	2	1
Outside target	0	0

What level of confidence is there in the accuracy and precision?

Social encounter monitoring has taken place mostly within the wilderness areas on the Tongass National Forest. Other statistics are gathered from outfitter/guide year-end reporting and reservation information gathered from recreation.gov. There is a high degree of confidence in the information, however, work is needed to improve monitoring efforts and data collection/access.

Monitoring Discussion and Findings

Question 33:

The Forest Plan components adequately reflect what is needed to manage the forest in accordance with the ROS class. However, the Forest Plan also allows for changing the ROS class in LUD's where non-recreation resource management activities are emphasized if it is not being met.

Question 34:

The National Visitor Use Monitoring program is used both to estimate visitation and provide descriptive information about the visitation and helps us meet REC3 VII in the Forest Plan. This program has been in place since 2000 and overtime district staff and forest staff continue to improve the design of the survey sites. One thing to note is this reflects national forest visits, or rather someone who entered the national forest for the purposes of recreation. Tourism changes do not always get reflected in the visitation levels since not all tourists will visit the national forest.

Adaptive Management Considerations

There may be a need to revise this monitoring item within the monitoring plan. Although the Forest Plan components are appropriate and ROS class guidelines set limits the Forest Plan also allows for changing the ROS class to meet changing conditions rather than placing further restrictions on visitors when ROS class is violated. Recommend reviewing this monitoring item for its usefulness and determining if there is a better method to measure ROS class for determining recreation and tourism trends and impacts.

Monitoring item (vi): Measurable changes on the plan area related to climate change and other stressors that may be affecting the plan area

Table 18: Monitoring question for item (vi)

Monitoring Item	Plan Component(s)	Associated Indicators	Data collection interval (dates)	Data Source / Partner
Question 2: What are the measurable changes to climate change and other stressors that may be affecting the Forest?	Climate Change and other stressors (AIR1 Forest Plan p. 4-3), Invasive Species (Forest Plan p. 4-22)	Changes in tree species composition as measured by basal area cover, and other changes including growth, sapling recruitment, harvest, snags, decay, and other relevant measures (TIM2) See also the "Invasive Species" and "Insects and Disease" sections as possible "other stressors"	5 years	Inventory data from FIA permanent plots established in 1995–2003 and remeasured periodically are used to provide estimates of tree species composition and other factors.

Monitoring summary and results for item (vi)

Question 2 of the Forest Monitoring Plan was not monitored for FY 20 and FY 21 because it is measured every 5 years. The climate change vulnerability assessments are identifying other indicators that may be appropriate for Forest Plan climate change monitoring. During the next monitoring plan revision those indicators should be considered for inclusion in the Forest Plan Monitoring program.

Monitoring items (vii): Progress toward meeting the desired conditions and objectives in the plan, including providing for multiple use opportunities

Table 19: Monitoring questions for item (vii)

Monitoring Item	Plan Component(s)	Associated Indicators	Data collection interval (dates)	Data Source / Partner
Question 20: 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?	Soil and Water: State water quality standards (SW3 I.A, Forest Plan p. 4-61)	Compliance and implementation of BMPs and the State Water Quality Standards	Annual	Field-collected data; Forest wide data bases; BMP Soil and Water Monitoring; watershed analysis

New Science or Other Information

No new science or information collected outside of this monitoring program was considered in the evaluation of this monitoring question.

Monitoring Results

This report summarizes best management practice (BMP) evaluations completed in Fiscal Year (FY) 2020, with emphasis on documenting the actions identified to improve and maintain nonpoint source pollution control and the protection of water quality.

Corrective actions respond directly to problems or deficiencies observed during evaluations. They may be either immediate or longer term, and usually apply specifically to the evaluation site. Adaptive management actions apply more broadly to changes in procedures to improve and maintain nonpoint source pollution control and the protection of water quality.

BMPs were evaluated at the project level based on implementation and effectiveness. Overall, BMPs evaluated in FY 2020 were found to be mostly implemented and effective. Exceptions are described in this report along with associated corrective and adaptive management actions and their completion status (Table 1 & Table 2).

Table 20: FY20 list of corrective actions

Site	Actions	Status (May 2021)
Sitka Co-located office	• Replace the appropriate signage on the fuel storage shed.	• Complete
Big Thorne Unit 8-808	• Decommission temporary road after closing public access for firewood and clean ditch on system road.	• Complete.

Table 21: FY20 list of future adaptive management actions.

Site	Actions	Status (May 2021)
Staney East Middle Fork Restoration	• Complete needed updates to corporate streams dataset. • Verify all fish bearing streams are identified in project area	• Feedback provided to program staff.
Sitka Co-located office	• Add to the O&M plan provisions to avoid the removal of road and parking lot surfacing material and avoid storing snow piles and berms in drainage pathways to avoid diversion potential and silting of the pathway. • Improve documentation of drainage control inspections (include small tributary creek along south perimeter).	• Completed by facilities engineer. • Completed by facilities engineer.
Staney Water Crossing 2050400-0.56	• Improve documentation of project oversight, particularly related to erosion control, dewatering, and final acceptance of work.	• Feedback provided to program staff.

Site	Actions	Status (May 2021)
Hoonah Water Crossing 85082-0.436	• Improve documentation of site-specific erosion control plan and daily diaries/photos of construction process.	• Feedback provided to program staff.
Big Thorne Unit 8-808	• Correct Class IV stream locations in corporate database. • Emphasize distinction between non-streams and Class IV in annual trainings. • Emphasize Forest Plan standards for RMA buffer widths in annual training. • Update temporary roads location in corporate layer.	• Feedback provided to program staff.

FY 2020 Overview

BMP evaluations were conducted by interdisciplinary teams (ID Teams) following national protocols (Photo 1). At a minimum, ID Teams included a soil, water or fisheries specialists and field personnel responsible for implementing the BMPs. Other interested Forest Service personnel along with representatives from state and federal agencies and private industry were invited and participated. The protocols include standard data forms and instructions for site selection and evaluation. Forms were completed in the field and all findings were discussed before leaving the site. Completed forms are available on request.

Figure 11: Darin Watschke, restoration, and partnership coordinator, on the bank of Staney East Middle Fork restoration project during the BMP review

The Tongass Forest Plan emphasizes BMP monitoring of timber harvest, roads, and recreation activities. Additionally, the Tongass NF was assigned a national BMP program target for FY 2019 and FY 2020 to monitor at least one protocol in each of the activities identified in the National Core BMP Technical Guide[1], except for Rangeland Management and Wildland Fire. These targets were achieved except for monitoring a minerals management activity, which was postponed to FY 2021 due to COVID-19 travel restrictions.

FY 2020 monitoring efforts evaluated seven sites across five Ranger Districts representing five different activities. As a result of COVID-19 travel restrictions, all monitoring reviews that took place after April 2020 were conducted by staff local to the project area. Traditionally in office document reviews were performed either virtually or outside office compounds and field evaluations followed protocols outlined in approved risk assessment safety documents.

Monitoring Item (viii): The effects of each management system to determine that they do not substantially and permanently impair the productivity of the land

Table 22. Monitoring questions for item viii

Monitoring Item	Plan Component(s)	Associated Indicators	Data collection interval (dates)	Data Source / Partner
Question 19: Are the soil conservation practices implemented and effective in meeting Alaska Regional Soil Quality Standards and maintaining soil productivity?	Watershed Resources Planning (SW3, Forest Plan p. 4-61)	Compliance and implementation of the Region 10 Soil Quality Standards	Annual	Field-collected data; Forest wide data bases; BMP Soil and Water Monitoring; watershed analysis

New Science or Other Information

In fiscal years 2020 and 2021, soil quality monitoring involved (1) documenting vegetation and soil recovery in the Staney wildlife gaps project area (Richter, Landwehr, and Foss, 2021), (2) documenting vegetation and soil recovery in the Soda Nick, 19 Mile, and Harris Strips root-wad harvest areas (Richter, Landwehr, and Foss, 2021), (3) continuing to monitor the amount of soil disturbance caused by off-highway vehicles (OHV) used for meat (game) retrieval on the Yakutat Forelands, and documenting the natural recovery of those disturbances over time (Catterson and Oehlers, 2020 and 2021), and (4) completing a landslide frequency analysis across the forest (Landwehr and Richter, 2021).

The landslide frequency analysis compared young-growth landslide frequencies before and after the implementation of the 1997 forest plan slope stability standards, updated landslide frequency estimates for forest and project-level analyses and sought to better understand the role of different physiography, surficial geology, and lithologies (ecological subsections) on landslide frequency.

Monitoring Results for Item

In the Staney wildlife gaps project area, rutting occurred in some locations where heavy equipment was used to create wildlife canopy gaps. Monitoring of the area indicated that the ruts quickly revegetated in most locations. Localized erosion decreased over time and is now negligible due to revegetation and armoring of flow paths. The Staney site met Soil Quality Standards in [year].

Root-wads were harvested from 19 Mile, Harris Strips, and Soda Nick sites for stream restoration projects in the early 2010s. Monitoring of the root-wad harvest locations was completed to evaluate vegetation recovery in disturbed areas. Full revegetation of root-wad harvest areas at 19 Mile and Harris Strips occurred in less than three years, which is like conventional log-only harvest areas. At Soda Nick, full revegetation of root-wad harvest areas took about nine years, likely due to greater soil disturbance from a higher number of root-wads extracted compared to the other sites. All three sites met Soil Quality Standards.

Monitoring Evaluation Recommendations

The Forest Plan monitoring program is meant to “enable the responsible official to determine if a change in plan components or other plan content that guide management of resources on the plan area may be needed” (36 CFR 219.12, Table 16).

Table 23: Summary of findings and results for the eight required monitoring items in 36 CFR 219.12 (a)(5) for the Plan Monitoring Program.

Monitoring Item and Plan Questions	Year Updated	Do monitoring results demonstrate intended progress or trend toward Plan targets?1	Based on the evaluation of monitoring results, may changes be warranted?	If a change may be warranted, where may the change be needed? 2
(i) The status of select watershed conditions. (Question 21)	2021	Yes	No	N/A
(ii) The status of select ecological conditions including key characteristics of terrestrial and aquatic ecosystems. (Questions 3, 6, 7, and 12)	2021	Yes	No	N/A
(iii) The status of focal species to assess ecological condition required under 36 CFR 219.9.	N/A	C-The Tongass National Forest has not yet designated focal species	Yes, need to designate focal species.	Monitoring Program
(iv) The status of select ecological conditions required under 36 CFR 219.9 to contribute to the recovery of federally listed threatened and endangered species, conserve proposed and candidate species, and maintain a viable population of each species of conservation concern. (Question 17)	2021	Yes	Yes, Need to designate species of conservation concern.	Monitoring Program
(v)The status of visitor use, visitor satisfaction, and progress toward meeting recreation objectives. (Questions 33 and 34)	2021	Yes	No	Monitoring Program
(vi) Measurable changes on the plan area related to climate change and other stressors that may be affecting the plan area. (Question 2)	2017	A-Yes, the monitoring is based on a 5- year review of FIA data.	Yes, the vulnerability assessments are identifying other potential indicators	Monitoring Program
(vii) Progress toward meeting the desired conditions and objectives in the plan, including for providing multiple use opportunities. (Plan Questions 19 and 20)	2021	Yes	No	N/A
(viii) The effects of each management system to determine that they do not substantially and permanently impair the productivity of the land. (Plan Question 19)	2020	Yes	No	N/A

[1] (A) Interval of data collection is beyond this reporting cycle; (B) more time/data are needed to understand status or progress of the plan component; (C) methods/results are inadequate to answer monitoring question (C).

Appendix A – Other Monitoring Items Evaluated in the Report

Summary of other Monitoring Questions

Question 1: Is air quality being maintained?

Alaska Department of Environmental Conservation (ADEC) and the U.S. Environmental Protection Agency (EPA) review for 2020: (Is air quality for human health concerns being maintained and if not, how will non- attainment of certain pollutants impact natural resources on adjacent NSF lands?)

PM $_{10}$: The North American Air Quality Standard (NAAQS) is150 μg/m^3 – Juneau Mendenhall Valley's two highest 24-hour averages in 2020 were 34 μg/m^3 and 35 μg/m^3. Juneau's Mendenhall Valley was designated non-attainment for PM_{10} on November 15, 1990, and re-designated 'attainment' status in 2013 by ADEC (ADEC 2022a). In November 2021 the EPA approved the second limited maintenance plan with a focus on monitoring and regulating wood smoke and adaptive actions to control fugitive dust that continue to meet 'attainment' NAAQS (ADEC 2022b).

PM $_{2.5}$: The EPA air quality standard for fine particulates, or $PM_{2.5}$, is 35 μg/m^3. Data from 2019-2020 indicate that Juneau has met federal air quality standards for PM $_{2.5}$ with an average 21 μg/m^3 at the Floyd Dryden site in the Mendenhall Valley (ADEC 2022a). The only 24-hour average exceedance was on December 31st at 35.7 μg/m^3.

Contaminant thresholds in lichens for 2020-2021: (How to determine the current air resource condition?)

Wilderness areas managed by the Forest Service report Wilderness Stewardship Performance scores annually to depict management effectiveness. Air quality monitoring plots were visited in the Stikine-LeConte Wilderness in (Table 25); no sites were visited in 2020. Two species were collected for tissue analysis at each of the five sites – *Alectoria sarmentosa* and *Platismatia glauca*. Lichen tissue has been submitted to the lab in [year] for analysis and we are awaiting results to compare to the contaminant thresholds for the Stikine-LeConte Wilderness.

Table 24: Lichen biomonitoring plots revisited in 2021.

Plot Number	Location	Wilderness Area	First established	Visit number
195	Gut Island	Stikine-LeConte	1991	4
30	Shakes Slough	Stikine-LeConte	1989	4
31	Gauging Stn	Stikine-LeConte	1989	4
494	Andrews Crk	Stikine-LeConte	2004	3
495	Flemer Cabin	Stikine-LeConte	2004	3

Conclusions

In summary, the City of Juneau's Mendenhall Valley area has been redesignated in 'attainment' status for PM_{10} yet is still working with the State of Alaska DEC and the EPA in implementation of the 2nd 10-year maintenance plan.

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. If plots contain contaminants of concern elevated above threshold, they may be monitored more frequently to determine the trend in concentrations and any effects to the lichen community at those sites.

Before 1989, ADEC monitored air quality in limited urban and industrial zones in Southeast Alaska. Since 1989, the Tongass has actively monitored National Forest air quality and is now better informed about local and regional air quality issues, especially as they affect Wilderness. Air quality on the Tongass National Forest is relatively clean compared to the rest of the country due to high precipitation, oceanic winds, low population, and distance from major pollution sources. Air pollutants impacting scenic values and other resources on the Tongass come from forest fires in interior Alaska and Canada; glacial, volcanic, and road dust; fuel combustion from marine vessels, especially sight-seeing ships in Wilderness areas and other types of marine and land vehicles; wood burning stoves, and light industry. Trans-Pacific PAN, persistent semi-volatile organic pollutants, black carbon, and greenhouse gases are a growing concern for all of Alaska, especially due to the roles these pollutants play in accelerating climate change at these high latitudes.

Question 8: Are destructive insects and disease organisms increasing to potentially damaging levels following management activities?

Each year, USDA Forest Service Forest Health Protection (FHP) and the Alaska Department of Natural Resources (DNR) Division of Forest Health & Fire Protection conduct aerial detection surveys by aircraft, mapping active forest damage from insects, diseases, animals, and abiotic causes. These surveys cover approximately 15 percent of Alaska's 126 million acres of forest annually. The aerial detection survey usually occurs in the second half of July and early August to capture peak damage from insects and diseases that defoliate trees. Over 40 years of aerial survey data has been collected in Alaska, offering a unique perspective of Alaska's dynamic and changing forests. For more information, or to request special surveys and survey data, visit the Alaska aerial detection survey webpage. Throughout the forest health monitoring section of the report, follow links to relevant Alaska FHP webpages and products for the most current information.

While Alaska's forests have not been as severely impacted by introduced insects and pathogens as much of North America, several invasive insects have become established in Alaska. The most impactful to the Tongass has been spruce aphid, which has been a pest of Sitka spruce since the 1960s, most notably in milder climates and following warmer winters.

2020 Monitoring Results

- Forest Health Conditions in Alaska - 2020
- Alaska Forest Health Highlights
- Alaska Forest Health Highlights Story Map
- Remote Sensing Damage Map (pdf) (aerial detection survey cancelled in 2020)
- Interactive Forest Damage Map (remote sensing & ground survey approach)

- Cumulative Ground Detection Survey Dashboard
- 1,466 research grade observations in the iNaturalist project

2021 Monitoring Results

- Forest Health Conditions in Alaska - 2021
- Alaska Forest Health Highlights
- Alaska Forest Health Highlights Story Map
- Aerial Detection Survey Damage & Flightline Maps (pdf)
- Interactive Aerial Detection Survey Map
- Cumulative Ground Detection Survey Dashboard
- 1,516 research grade observations in the iNaturalist project

In 2021, Alaska's aerial detection surveys resumed after a one-year hiatus due to the COVID-19 pandemic. Approximately 1.2 million acres of damage were mapped across the 15.7 million acres aerially surveyed. Of that, nearly 750,000 acres were mapped in Southeast Alaska. In addition, our forest health team made more than 800 ground observations of forest damage from diseases (430 records), insects (359 records), and noninfectious agents (21 records), which can be accessed through the interactive data dashboard at https://arcg.is/1SH58a.

Forest management practices can have beneficial or deleterious impacts on forest health and resilience and management targets. Forest health evaluations of young managed stands in the mid-1980s detected a relatively low incidence of damage (Tait et al. 1985, Occurrence of Insect and Disease Pests on Young-Growth Sitka Spruce and Western Hemlock in Southeastern Alaska, PNW-433), but many insects and pathogens can damage trees in young stands during outbreaks. Recent conifer defoliator outbreaks across Southeast Alaska have affected all stand ages, with greatest amount of damage in stands with higher hemlock density. Hemlock canker, a disease of western hemlock concentrated along roads adjacent to managed young growth, caused localized, synchronized hemlock mortality on Prince of Wales Island and other locations across the Tongass during an outbreak from 2012-2016. With the first detection of yellow-cedar decline in managed young-growth in 2012, there is heightened interest in understanding the extent and severity of the problem and how it can be mitigated in managed stands. Spruce aphid, an introduced pest of Sitka spruce, has outbreaks tied to mild winter conditions, usually affects old-growth coastal forests and open grown landscape trees, but can impact managed Sitka spruce stands by reducing radial growth during outbreak years.

Clearcut harvest practices, common on the Tongass National Forest, eliminate hemlock dwarf mistletoe and conifer stem decay fungi from managed units for a century or more due to the slow recolonization and spread of the causal organisms. Though the loss of hemlock dwarf mistletoe and stem decay can increase timber yields, it represents a long-term loss of wildlife habitat, including decay cavities in standing trees, platforms, and other aspects of structural heterogeneity associated with large, defective trees. Various strategies can be implemented to help to recover desired wildlife habitat characteristic where this is a key management objective (Hennon and Mulvey 2014, Managing Heart Rot in Live Trees for Wildlife Habitat in Young-Growth Forests of Coastal Alaska). Studies of hemlock dwarf mistletoe in Southeast Alaska have found that low to moderate severity dwarf mistletoe infection is not associated with tree mortality or significant growth loss (Trummer et al. 1998, Canadian Journal of Forest Research, https://doi.org/10.1139/x98-13). Although mistletoe would be exceedingly difficult to reintroduce to managed stands, it is possible to increase the incidence of stem decay through intentional stem

wounding. The habitat requirements of wildlife species of interest can be used to develop wounding treatments; for example, cavity development can be promoted by wounding trees of a certain species and size at the optimal height from the ground.

The Climate Adaptation Strategy for Conservation and Management of Yellow-Cedar in Alaska synthesizes the ecology, value, taxonomy, and silvics of yellow-cedar; the causes of decline; active management opportunities; and the current and projected status of yellow-cedar in 33 management zones (Hennon et al. 2016, General Technical Report PNW-GTR-917). Yellow-cedar decline has been mapped across more than 700,000 acres in Southeast Alaska. Forest management approaches such as planting and precommercial thinning to favor yellow cedar can be used to increase its presence in managed stands. Where economical, salvage harvest of yellow-cedar trees killed by decline root freezing injury may offset harvests of healthy yellow-cedar elsewhere. **Young-growth yellow-cedar decline is an emerging issue**, particularly where soils are wet or shallow. The problem was first observed in young-growth forests on Zarembo Island in 2012; before that, decline had only been observed in old-growth forests. To facilitate young-growth yellow-cedar decline monitoring, we compiled a database of 338 managed stands on the Tongass National Forest with yellow-cedar. Alongside the database, low-altitude aerial imagery and aerial detection surveys are used to identify stands with discolored tree crowns and suspected decline, which are then inspected on the ground. Decline has been ground-verified in 33 young-growth stands on Zarembo, Kupreanof, Wrangell, Mitkof, and Prince of Wales Islands. Affected stands are typically 27- to 45-years-old, precommercial thinned between 2004 and 2012, and occur on sites with south to southwest aspects and wet or shallow soil. Now that yellow-cedar decline is known to occur in young-growth stands, we must consider how precommercial thinning and other management activities influence soil temperature fluctuation, particularly in management units that are not expected to retain consistent snowpack for decades to come. Yellow-cedar planting sites should be carefully selected with both snowpack and unrestricted rooting depth in mind, promoting yellow-cedar where it is expected to thrive long-term.

Question 11: Are the trends in abundance of Dolly Varden char, Cutthroat trout, and Coho salmon related to changes in habitat associated with forest management, climate change or other factors?

Coho salmon spawn in nearly 4,000 watercourses throughout Southeast Alaska, including the headwaters of transboundary rivers in British Columbia and the Yukon Territory. Most coho salmon streams are small with spawner numbers typically upwards of 1,000 fish, while lake systems produce runs between 1,000 and 10,000 coho salmon. In addition to wild stocks, eleven hatcheries throughout southeast Alaska contribute additional coho salmon to the overall annual harvest. Annual wild commercial harvest of coho salmon in Southeast Alaska is reported by the Alaska Department of Fish & Game, and the Forest Service evaluates these estimates for trends (Figure 10).

The region-wide commercial harvest estimates, index of total wild coho abundance in Southeast Alaska, and escapement data from index streams are indicators of the annual abundance and potential trends of adult coho returning to Southeast Alaska. Since juvenile coho normally spend one or two years in freshwater, juvenile survival is potentially affected by changes in the quality of stream habitat. Research in the Pacific Northwest and in Southeast Alaska has shown that forest management affects coho salmon on a stream-by-stream basis. Monitoring the abundance of juvenile coho in freshwater appears to be a more direct indicator of potential effects of timber harvest and other management activities as sources of annual variation from marine survival and commercial and sport harvest are largely excluded.

The 2021 Southeast Alaska all-gear coho salmon harvest (including freshwater and marine sport) totaled 1.72 million fish, of which 1.45 million fish (84percent) were harvested in commercial fisheries (Priest 2022). The 2021 coho salmon commercial harvest of 1.45 million[1] was 67percent of the recent 10-year (2011-2020) average, and 62percent of the long-term (1995-2020) average (Priest 2022). Of the total 2021coho salmon commercial harvest 1.07 million fish (74percent of the total commercial harvest) was estimated to be wild (rather than hatchery origin), up from the 2020 wild harvest of 0.82 million fish, yet lower than the 10-year average of 1.64 million fish (Priest 2022).

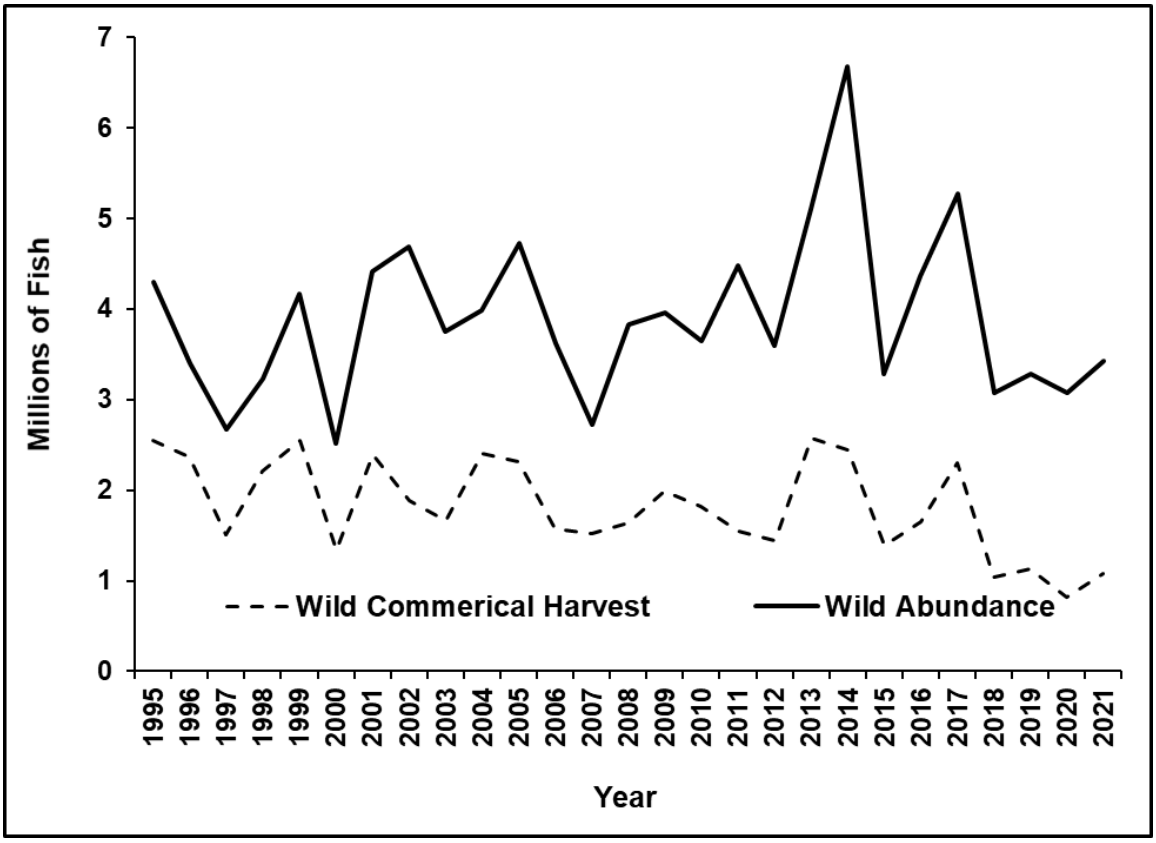

Figure 12: Annual wild commercial harvest and wild abundance of coho salmon in Southeast Alaska from 1995 through 2021. Data provided by ADF&G.

ADF&G calculated an index of total wild coho salmon abundance in Southeast Alaska coastal waters based on the estimated wild troll harvest divided by an index of the troll exploitation rate. The 2021 estimated wild coho population abundance of 3.42 million fish was 19percent lower than the recent 10-year (2011–2020) average of 4.22 million and 16percent below the 20-year average (Priest 2022). The abundance estimates are thought to be a better indicator of actual abundance trend than the commercial harvest (Shaul et al. 2011).

Coho escapements (those fish that “escape” capture and spawn) are difficult to estimate since the adults enter spawning streams during the fall when flows are often high, and coho routinely distribute throughout the watersheds. ADF&G has selected a small number of representative streams across Southeast Alaska to carefully count or estimate escapement, with weirs and coded wire-tagging operations on three systems and foot or aerial surveys conducted on another suite of streams. Hugh Smith Lake coho salmon run is the only wild, coded wire tagged (CWT) coho salmon indicator stock in southern Southeast Alaska and an important indicator of commercial troll harvest rate on southern inside stocks. Auke Creek and Berners stocks, additional sites with on-going CWT studies to provide

estimates of harvest, marine survival, and age composition, are important indicators of the commercial troll harvest rate on northern inside stocks. All these sites are used for in season estimation of regional wild salmon abundance and escapement. Data from these streams and rivers are available for the Forest Service to review for general trends.

In 2020, coho salmon escapement counts and estimates were generally within or below escapement goals for most coho salmon stocks currently monitored in Southeast Alaska with formal escapement goals, with northern inside systems generally below average (Hagerman et al 2021). Spawner escapement in Auke Creek dropped to 173, outside of the minimum base escapement goals range of 200-500 spawners. Berners River was slightly below the minimum escapement goal range of 3,600-8,100, with 3,296 coho salmon. The Juneau Road system stock in Peterson Creek was below its goal of 100-250, with 65 coho salmon. Montana Creek, also on the Juneau Road system, had an estimated escapement count that fell within the sustainable escapement goal range. Coho salmon returns in outer coastal systems were generally below average, and escapement count for the five systems in the Sitka area fell below the 38-year (2008-2019) average of 1,380 fish but above the biological escapement goal upper range. The Ketchikan area stocks, comprised of 14 streams, came in just above the escapement goal range of 4,250-8,500 at 8,610 fish yet below the 33-year (1987-2019) average of 10,495 fish. No escapements were obtained at the Situk River and Tawah Creek in the Yakutat area in 2020 due to consistent high water through the fall.

Per ADF&G (2021) and Priest (2022), 2021 coho salmon escapement counts and estimates followed similar trends with 2020, generally falling within or below goals for most coho salmon stocks currently monitored in Southeast Alaska with formal escapement goals (Table 26). Coho salmon escapements were within the respective goal ranges for four northern Southeast stocks (Chilkat River, Berners River, Auke Creek, and Taku River), and below the goal for two northern Southeast stocks (Montana Creek and Peterson Creek). The total escapement of 903 adult coho salmon to Hugh Smith Lake was within the biological escapement goal of 500–1,600 spawners. The combined peak count of 21,006 coho salmon in the 14 surveyed streams in the Ketchikan area was the highest count on record, far above the goal of upper goal of 8,500 spawners and above the 1987–2020 average (9,025). The combined peak count of spawners in five streams in the Sitka area (1,486 spawners) came in above the escapement goal of 400–800 spawners. No escapements were obtained at the Situk River and Tawah Creek in the Yakutat area in 2021 due to consistent high water through the fall.

Per Priest (2022), coho salmon stocks (Hugh Smith, Auke Creek, and Berners River) monitored in 2021 for CWTs all experienced a decline in total adult production. At Hugh Smith Lake, the estimated total run size of 1,954 adults was about half of 1996–2020 average (3,553). This decline in total run size is due the second lowest smolt production on record and to a long-term decline in marine survival. The preliminary 2021 Hugh Smith Lake coho salmon marine survival rate of 8.9percent is historically below average (11.2percent) but higher than the 5-year average (5.8percent). This cycle of persistently low marine survival appears to be the largest driver of reduced total run size in recent years.

Like Hugh Smith Lake, 2021 coho salmon marine survival (and associated adult total run estimates) for the northern inside stocks stood below the long-term average. Smolt-to-adult survival rates of 7.2percent for the Berners River and 9.9percent for Auke Creek were much lower than the long-term (1996–2020 return years) mean survival rates of 13percent (Berners River) and 17percent (Auke Creek). The 2021 total estimated adult coho salmon run size in the Berners River was 9,977, far below the 1996–2020 average (21,483). Marine survival for Northern inside coho salmon stocks has been low in recent years: four of the lowest five years for marine survival have occurred in the past six years. While 2021 showed improvement compared to 2020, adult total runs and marine survival rates are still far below

historical levels. Further details on general trends in Southeast Alaska coho salmon stocks are discussed in Priest et al 2021.

Table 25: Preliminary ADF&G escapement estimates for most Southeast Alaska coho salmon stocks with escapement goals, 1997-2021 (ADF&G 2021; Priest 2022). Bold estimates fall below the goal range for a particular stock.

System	Situk River	Tawah Creek	Auke Creek	Montana Creek	Berners River	Peterson Creek	Hugh Smith Lake	Sitka Area	Ketchikan Area
Goal Range	3,300-9,800	1,400-4,200	200-500	400-1,200	3,600-8,100	100-250	500-1,600	400-800	4,250-8,500
Goal Type[1]	BEG	SEG	BEG	SEG	BEG	SEG	BEG	BEG	BEG
1997	9,780	2,550	609	1,018	10,050	186	732	809	5,037
1998	NA	NA	862	1,160	6,802	102	983	1,242	7,135
1999	NA	NA	845	1,080	9,920	272	1,246	776	8,038
2000	NA	1,572	683	961	10,650	202	600	803	8,634
2001	5,030	3,190	865	1,119	19,290	106	1,580	1,465	11,866
2002	40,000	8,093	1,176	2,448	27,700	195	3,291	1,868	12,223
2003	6,009	5,907	585	808	10,110	203	1,510	1,101	11,890
2004	10,284	2,214	416	**364**	14,450	284	840	1,124	11,284
2005	2,514	**1,241**	450	**351**	5,220	139	1,732	1,668	14,840
2006	7,950	**1,156**	582	1,110	5,470	439	891	2,647	6,898
2007	5,763	1,751	352	**324**	3,915	226	1,244	1,066	4,832

System	Situk River	Tawah Creek	Auke Creek	Montana Creek	Berners River	Peterson Creek	Hugh Smith Lake	Sitka Area	Ketchikan Area
2008	NA	NA	600	405	6,870	660	1,741	1,117	16,658
2009	5,814	3,581	360	698	4,230	123	2,281	1,156	8,670
2010	11,195	2,393	417	630	7,520	467	2,878	1,273	4,596
2011	3,652	**1,221**	517	709	6,050	138	2,137	2,222	5,097
2012	**3,007**	NA	837	**394**	5,480	190	1,908	1,157	11,940
2013	14,853	2,593	736	**367**	6,280	126	3,048	1,414	11,287
2014	8,226	3,555	1,533	911	15,480	284	4,110	2,161	16,795
2015	7,062	2,015	577	1,204	9,940	202	956	2,244	10,039
2016	6,177	**746**	204	717	6,733	**52**	948	2,943	13,419
2017	4,122	1,455	283	634	7,040	**20**	1,266	1,280	11,563
2018	6,198	2,211	**146**	1,161	**3,550**	172	619	1,502	13,886
2019	10,381	1,866	345	**203**	9,405	NA	1,235	1,480	7,913
2020	NA	NA	**173**	495	**3,296**	**65**	634	630	8,610
2021	NA	NA	322	**392**	5,933	**15**	903	1,486	21,006

[1]Goal Types include sustainable (SEG) and biological (BEG) escapement goals.

A query for potential monitoring sites with subsequent site visits was completed in 2008-2009. During field season 2009, a total of five treatment sites and five control sites were established and monitored but only one or two additional potential sites were identified. Primarily, the difficulty in identifying qualifying sample sites is due to the protocol stipulation that the treatment sites be located within sub watersheds that have no timber harvest before 1997 Forest Plan guidelines were implemented and any harvest that does exist to have occurred no more than 4 years from the start of sampling. Most of the recent timber harvest and proposed timber harvest on the Tongass is located within sub-watersheds with pre-existing older harvest units. It was determined that sufficient sampling sites as defined in the protocol were not attainable.

Freshwater coho fish population monitoring was placed on hold during 2010-2011. The Tongass freshwater coho fish population monitoring protocol was redesigned in 2012 to better address current forest management actions with additional emphasis on watershed restoration and young growth management with limited harvest of old growth. The current fish habitat monitoring framework tracks the watershed condition, in-channel habitat characteristics and abundance of populations of juvenile coho salmon within several stream reaches in each of 14 watersheds on the Tongass National Forest. Watersheds sampled represent the range and degree of management prescriptions across the Tongass. Sample protocol follows a rotating panel design in which 14 watersheds are planned for sampling over an eight-year period. In any one year, five watersheds will be sampled, two of which are re-sampled on a 4-year basis and two sampled every year. One of the annually sampled watersheds is intensively managed while the other is in a natural condition.

In 2012, sampling was completed in four watersheds during July-August. These included two fixed, annually sampled watersheds and two watersheds sampled once every four years. Ideally five watersheds would have been sampled this year, but weather and high flows prevented the sampling in one of the watersheds. During 2013, the two annually sampled fixed watersheds were resampled and four new rotating panel watersheds were sampled. In 2014 and 2015, both annually sampled watersheds and three rotating panel watersheds were sampled. In 2016 both annually sampled watersheds and two rotating watersheds were resampled, and one new rotating watershed was added and sampled. Between 2017 and 2019, both annually sampled watersheds and two rotating watersheds were resampled each year. The final year for this 8-year study was 2019.

This longer-term monitoring data including fish numbers, in-channel habitat measures, and landscape scale measures in sample watersheds are currently being analyzed by statisticians at the U.S. Forest Service Pacific Northwest Research Station. Analysis and reporting are expected to be complete in 2023. No changes to Forest Plan standards and guidelines are recommended. The Watershed Restoration Effectiveness Monitoring (WREM) program also addresses coho salmon population monitoring associated with in-stream restoration projects. Refer to Soil and Water Question 21 –Watershed Health response for further detail. Annual review of ADF&G's commercial harvest and wild stock escapement data will continue to aid analysis.

Question 13: Is riparian vegetation maintained or restored to a condition that supports key riparian functions?

The Tongass National Forest Land Management Plan Riparian Buffer Standards and Guidelines established buffer width design elements for riparian area protection based on stream process groups. Stream process groups are based on the geomorphic characteristics of the stream channel and riparian area. For most process groups the design elements are followed by the phrase "Manage an appropriate distance beyond the no-harvest zone to provide for a reasonable assurance of windfirmness of the riparian management area (RMA). Pay special attention to the area within one site-potential tree height

on the RMA." The area beyond the no-harvest zone has become known as the RAW zone, short for Reasonable Assurance of Windfirmness.

As part of riparian monitoring, timber sale unit implementation cards were reviewed for buffer width information and RAW zone characteristics. Most unit cards associated with the monitored RMAs did not include RAW zone prescriptions, widths, or characteristics. This lack of information is an impediment to clearly distinguishing between windthrow in the RMA and RAW zone. Due to this omission the monitoring results in this report, currently, do not consistently distinguish between windthrow in the RMA and in the adjacent and potential RAW zone.

By retaining riparian vegetation in a condition found within the range of natural variability it is anticipated that Forest Plan riparian objectives can be achieved. If windthrow is exacerbated beyond the range of natural variability its effect will need to be understood to assess if natural channel processes are maintained in a natural condition as desired in the Forest Plan Riparian Standards and Guidelines.

The windthrow mortality measured in buffers adjacent to harvest units has yet to be compared to that found naturally within riparian areas adjacent to un-harvested forest stands. Low elevation aerial images of un-harvested forest stand up and downstream of many of the monitored buffers have been obtained and will be used as control stands. Upon completion, this comparison will help determine if windthrow has been exacerbated beyond that found within the natural range of variability. Cursory observations of these control stands suggest that significantly less windthrow is present within them than in the treatment stands. Therefore, current windthrow abatement practices may not be completely 100 percent effective.

Based on the monitoring results to date, timber harvest has likely exacerbated 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 42 percent of the completed monitored areas and the average amount of cumulative windthrow is 6.6 percent. The cumulative windthrow mortality in the 210 completed buffers is highly variable and ranges from 0 to 70 percent. To date 95 percent of the buffers have less than 35 percent windthrow. For the total 261 total buffers in this monitoring project, preliminary results indicate cumulative windthrow ranges between 0 and 85 precent with 36 percent having no windthrow and 57 percent having less than 35 percent windthrow. Four percent of the buffers had 50 percent or more cumulative windthrow and were predominately on class III streams that had buffers on both side of the stream.

Results for most of the analyzed buffers suggest that the rate of windthrow diminishes over time. There are some exceptions to this in the buffers monitored in 2001 harvest units where there is no windthrow in the first 3 years and then windthrow at 4-, 10-, and 15-years post-harvest. These were mostly single trees blowing down within the buffer area. Additionally, the buffers from some 2003 harvest units show an increase in blowdown at 10 years post-harvest but more research is needed to determine the cause. Others who have measured windthrow have found that most windthrow occurs within the first few years after harvest and that windthrow will diminish the longer the buffer is standing (Andrus and Froehlich 1992, Moore 1977, Alexander 1964). Trees within the edge of a buffer become more windfirm over time as their root structure adjusts (Stathers et al. 1994, Urban et al. 1994).

Wind and rain are major factors in windthrow. Southeast gales are the most damaging fall and winter storms that occur in Southeast Alaska. These storms originate in the northern Pacific and rotate counterclockwise as they move northeast across Southeast Alaska (Harris, 1989). Due to this dominant storm track the southeast and southwest outer edges of islands are more susceptible to windthrow than northeast edges of the islands (Harris 1989, Moore 1977, Kramer 2000, Nowacki and Kramer 1998).

Inland stream buffers may be less susceptible to windthrow (Andrus and Froehlich 1992, Kramer 2000, Kramer et al. 2001, Harris 1989). Localized Bora or Glacier winds have also been known to cause windthrow in forests of Southeast Alaska. The Bora or Glacier winds are associated with major river valleys penetrating the coast range, or with the temperature difference associated with ice fields (Harris 1989, Moore 1977). The Stikine River Valley near Wrangell and the Taku winds near Juneau are two examples of more localized damaging winds (Harris 1989, Kramer 2000). With wind often come rain, and the saturated soil conditions that often accompany a windstorm reduce soil strength and increase the chance for wind throw (Moore 1977, Harris 1989).

Aspect is another factor in windthrow. Preliminary monitoring results indicate that the amount of windthrow in buffers with a general northerly exposure tended to be less than that within buffers with a general southerly exposure. This appears to be in concert with Southeast Alaska weather patterns. Other investigations have provided inconsistent findings regarding the effect of buffer orientation on windthrow amount. Grizzell and Wolff (1998) found that buffer orientation was not a factor in the amount of windthrow in their study of buffers in the northern cascades. Conversely, other studies (Andrus and Froehlich, 1992, Moore 1977, Alexander 1964) indicated that buffers parallel to wind flow may be more windfirm than buffers perpendicular to wind flow. A greater susceptibility to windthrow was observed in buffers located on hill slopes with south and west hill slope aspects versus north and east aspects. The average windthrow mortality in buffers located on north and east facing hill slopes was approximately one-half of that measured on south and west facing slopes. Other studies support that stands with south exposures will be more susceptible to windthrow (Nowacki and Kramer 1998, Kramer 2000, Kramer et al. 2001, Moore 1977). Kramer et al. (2001) suggests that stands on slopes exposed to south facing azimuths between 160 and 220 degrees would be more susceptible to windthrow from cyclonic (southeast gale) wind events.

In summary...

Question 14: What are the population and habitat trends for the following species, and do the trends appear to be related to forest management, climate change, or other factors? Sitka Black-tailed Deer, Marten, Alexander Archipelago Wolf, Brown Bear, Black Bear, Mountain Goat, Bald Eagle?

Population and habitat trends are currently consistent with Forest Plan expectations (Table 17). Forest Plan standards and guidelines maintain productive old-growth habitats in non-development land use designations (LUDs) and development LUDs (which include portions of the Tongass National Forest open to potential timber harvest). Habitat retained in an undisturbed state in beach, estuary, and riparian buffers is important to many species, especially the bald eagle, brown bear, black bear, deer, and marten. In addition, thinning activities in young growth have the potential to improve wildlife habitat.

The reduction in productive old growth habitat in development LUDs has been less than projected in the Forest Plan. Since 2008, total volume harvested has averaged 32 MMBF annually, only 12 percent of the allowable harvest level of 267 MMBF. The 2008 Forest Plan Record of Decision (USDA Forest Service 2008a, page 20) states that there is no expectation that timber will be harvested at a continuous rate of 267 MMBF over the next planning cycle of 15 years (reference the Biodiversity Ecosystem section in the Forest Plan). Even if harvest occurs at maximum allowable levels for 100 years, the implementation of the Forest Plan would result in a moderate to very high degree of assurance that there would be sufficient habitat to support long-term viability of wildlife species. The conservation strategy provides a good to very good distribution of high quality old-growth reserves over the long term (USDA Forest Service 2008a, page 47).

[And what about climate change? And other factors? Are trends related to these factors? Refer to Question 14)

Table 26: Summary of population status from the most recently available Alaska Department of Fish & Game (ADF&G) management and harvest reports, breeding bird surveys, and deer pellet counts.

Species	Ketchikan, Prince of Wales, and vicinity (GMUs 1A & 2)	Petersburg, Wrangell, Kupreanof, and vicinity (GMUs 1B & 3)	Juneau, Douglas, Haines, Yakutat (GMUs 1C, 1D, & 5)	Admiralty, Baranof, and Chichagof (GMU 4)	Tongass-wide Population Trend
Wolf	Stable to increasing	Stable	Stable	Not present	Stable
Deer	Stable to Increasing	Stable	Stable	Stable	Stable
Marten	Stable	Stable	Stable	Stable	Stable
Black Bear	Stable	Stable	Stable	Not present	Stable

Question 16: Are the effects of management activities on subsistence users in rural Southeast Alaska communities consistent with those estimated in the Forest Plan?

Sockeye Monitoring and Escapement Trends

Sockeye Salmon stocks at Klag Bay, Falls Lake, and Klawock River have been monitored since the beginning of the Fisheries Resource Monitoring Program in 2001. Monitoring on Neva and Hetta Lakes began in 2002 and 2005, respectively. Sitkoh Lake was added to the program in 2010 and Eek Lake was added in 2015. To assess broad trends, the 5-year (2017-2021) and 10-year (2012-2021) average escapements were compared at each of these systems. The 5-year average escapement was higher than the 10-year average escapement at Neva, Klawock, Eek and Hetta, and lower at Klag, Sitkoh, and Falls.

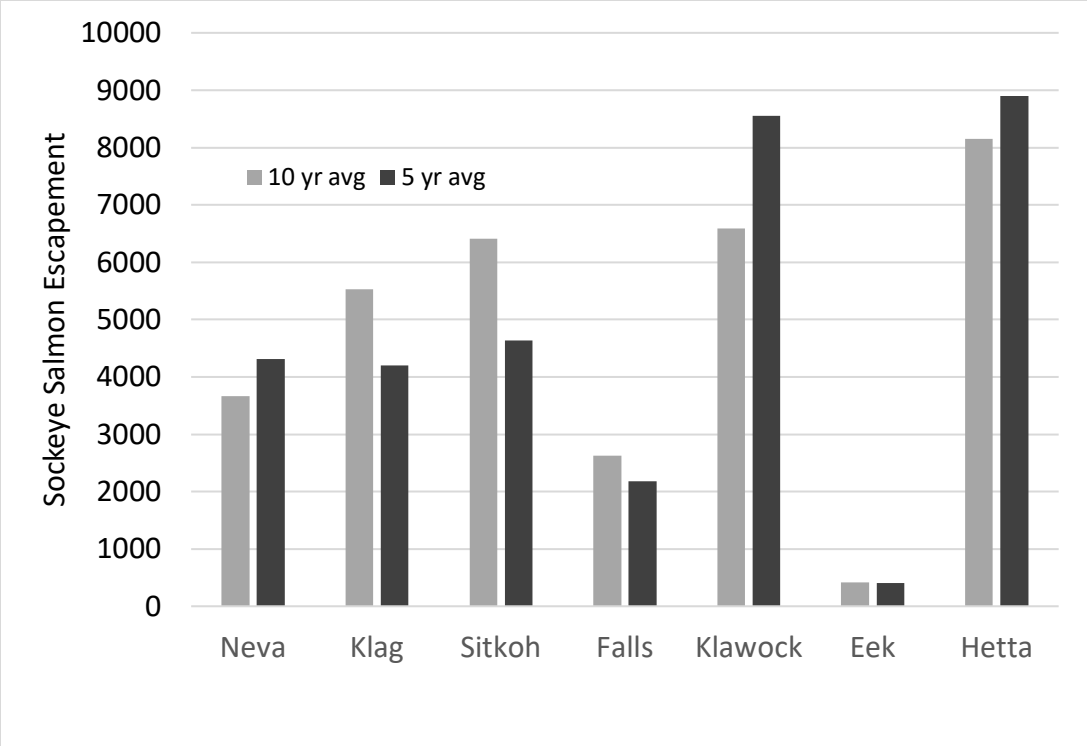

Figure 13: Sockeye escapement 5- and 10-year trends

The variability in sockeye escapement seems unrelated to management under the Forest Plan since riparian protections in the Forest Plan have prevented adverse impacts.

Other Subsistence resource monitoring

Eulachon returns have been monitored in the Unuk River most years since 2011. The return of eulachon to the Unuk River was characterized (by whom? ADF&G?) as "weak" in 2017, "good" in 2018 and 2019, and "moderate" in 2021. No National Forest ground disturbing activities occurred in the Unuk River drainage because it is designated as Wilderness.

Question 18: What are the cumulative effects of changes to habitats that sustain rare plants?

Nine R10 Sensitive Plant occurrences were revisited in 2020 and 2021. Four yellow lady's slipper populations were revisited on Prince of Wales Island -- three of the populations had fewer individual plants. Four round-leaved orchid populations were revisited on Prince of Wales Island -- three had fewer individual plants, one of which appears to be extirpated. The mountain lady's slipper occurrence revisited on Wrangell Ranger District had minimal change in plant counts.

Current R10 Sensitive Plants, namely round-leaved orchid and yellow lady's slipper should have monitoring sites established to ensure a standardized sampling methodology. The decline in 66.7percent of the populations revisited does not have the sampling consistency needed to draw conclusions; however, this downward trend highlights the importance of implementing a monitoring protocol.

Question 25: Is the Forest meeting demand for economic timber sales within the limits of the timber sale adaptive management strategy? Is there sufficient volume under contract or awaiting sale?

New information

The loss of Case No. 1:19-cv-00006-SLG, Southeast Alaska Conservation Council, et al. v. United States Forest Service, et al. in the District Court for the Alaska on March 11, 2020, for the Prince of Wales Landscape Level Analysis decision dramatically reduced the availability of the amount of timber that could be offered for sale.

On July 15, 2021, the Southeast Alaska Sustainability Strategy reduced the amount of old-growth harvest to five mmbf and sought to accelerate the transition to young-growth harvest. The amount of timber offered and harvest on the Tongass National Forest will not increase until environment analysis for young-growth forest has been completed and operators have either made needed infrastructure changes or found markets for young-growth timber products. Some inroads in the transition of the timber industry have started with several young-growth sales. Currently, the majority of young timber has been exported and this is the expectation for any larger sales in the future. Smaller young-growth timber sales are expected to provide local products.

Monitoring Results

The following results reflect updates from data collected for FY 2020 and FY 2021.

Table 27: Monitoring items for FY20 and FY21

	FY 20	FY 21
Annual demand	45.0 MMBF	49.8 MMBF
Volume offered [1]	2 MMBF	2 MMBF
Volume sold[1]	5 MMBF	2 MMBF
Volume harvested[1]	15 MMBF	15 MMBF
Number of sales	13	9
Volume under Contract end of FY[2]	51.7 MMBF	32.0 MMBF
Estimated Volume NEPA-cleared as of 09/30[3, 4]	123 MMBF	118 MMBF
Estimated Volume NEPA-cleared within mill working circles in south and central Tongass NF excluding Kuiu Island as of 09/30[3, 5]	55 MMBF	50 MMBF

The target for the annual timber demand was not met in FY 20 and FY 21. Bidding competition for small sales on Prince of Wales Island has increased as the demand for these sales have not decreased and in some instances increased.

From the original sawmills still in operation, five reported increased production, one sawmill reported decreased production, and one indicated production from 2019 to 2021 remained the same. That finding may be misleading, because three of the five reporting increased production were idle in 2019. Capacity and production in the newly added mills were 11 and 7 percent of the regional total, respectively. Most operators reported that 2021 had been a difficult year, owing to timber availability and supply chain issues, lingering impacts from the COVID-19 pandemic, transportation costs, difficulty finding reliable workers, and steep learning curves associated with operation of new equipment. Several mills had installed new equipment that was not operating in 2021 but will be captured in the survey conducted in 2022.

Adaptive Management Considerations

Since the five mmbf cap on old-growth timber in July 2021, most of the timber sale volume to meet the demand would come from young-growth timber. This is challenging for several reasons. Currently most of the young-growth timber is not of merchantable size or in a quantity in one location that makes logging efficient and economical. Also, a challenge is to meet the current Forest Plan direction for stands that were previously harvested under more lenient regulations. It is estimated that the trend towards meeting the volume targets reflected in the Forest Plan and annual demand calculations will not be realized until about 2026. This will be the timeframe to go through the NEPA process and implementation.

Question 27 – Is the amount of harvest within the ASQ? What proportion of the harvest is in each non-interchangeable component (NIC) and is the mix accurate compared to the Forest Plan?

Other Information:

In July 2021, the Southeast Alaska Sustainability Strategy reduced the amount of old-growth harvest to five mmbf and sought to accelerate the transition to young-growth harvest. The amount of timber offered and harvested on the Tongass National Forest will not increase until environment analysis for young-growth forest has been completed and operators have either made needed infrastructure changes or found markets for young-growth timber products.

2001 Roadless Rule – The Roadless Area Conservation Rule (2001 Roadless Rule) was originally codified at Title 36 of the Code of Federal Regulations (CFR) Part 294 (36 CFR 294), Subpart B (66 Federal Register [FR] 3244) in January 2001. The 2001 Roadless Rule was applied nationwide. The 2001 Roadless Rule remains in effect in Alaska and the Forest Service continues to apply the 2001 Roadless Rule within the Tongass and Chugach National Forests.

Monitoring Results

The following results are from data collected for FY 2020 and FY 2021.

Table 28: Years Forest Plan was revised and the ASQ for those revisions and the NIC I/NIC II percentage.

Year of Forest Plan Decision	ASQ/PTSQ	NIC I/NIC II Ration by Forest Plan
1997 Revision	267	80percent NIC I/20percent NIC II
1999 Record of Decision	187	80percent NIC I/20percent NIC II
2008 Forest Plan Amendment	267	89percent NIC I/11percentNIC II

2016 Forest Plan Amendment	46	Not calculated

Table 29: NIC I and NIC II Harvest for FY20 and FY21

	FY 20	FY 21
Amount of NIC I harvested	100percent	100percent
Amount of NIC II harvested	0percent	0percent

The lack of NIC II timber volume harvested reflects the impacts of the 2001 Roadless Rule which does not allow timber harvest in most of the NIC II lands. This trend is expected to continue especially with the abrupt transition to young growth. Most of the young growth is within NIC I lands.

Table 30. Summary of monitoring evaluation trends for all timber monitoring questions and indicators

Current Status	Trend Towards Target	Trend Away from Target
Within target		Amount of volume harvested compared to ASQ/PTSQ
Outside target		Ratio of Nic I/ NIC II

Question 30: Are Federal regulations (36 CFR 228) to ensure surface protection implemented, and is the administration of this regulation through the Forest Plan effective in limiting soil and water resource impacts?

Two large locatable mine plans have been administered, and several exploration-drilling programs and mineral material operations were processed in FY20 and FY 21. Inspections of mineral sites indicate that the effects of mining activities on surface resources are consistent with Forest Plan expectations. The requirement of the operator to obtain approval for their Plan of Operations provides the Forest Service with the opportunity and authority to control the effects of the development on the Forest's surface resources. No violations or action items expected to have significant or irreversible negative environmental impacts were documented by Forest Service inspections in FY20 and FY21. Additional permits administered by other agencies also contain requirements for design features, mitigation measures, and best management practices. Extensive monitoring programs required by those permits are conducted to ensure effects are within those allowed by law and regulation, and within the range expected in the environmental analysis.

Question 35: a) Are cultural resources being protected through regularly scheduled monitoring efforts for Priority Heritage Assets? b) Are cultural resources being managed at a project-specific level in accordance with Forest Service policy of avoidance and protection or through achieving a "no adverse effect" to historic properties with a signed Memorandum of Agreement with the State Historic Preservation Officer? c) Are sacred sites identified and protected through regularly scheduled monitoring efforts and/or consultation with affected tribes or Indian Religious Practitioners?

a) **Are cultural resources being protected through regularly scheduled monitoring efforts for Priority Heritage Assets?**

No, we have not been protecting Priority Heritage Assets (PHAs) through regularly scheduled monitoring efforts. The Tongass National Forest currently has 229 PHAs. Up until recently, the program did not have the staff or other resources to schedule regular monitoring trips and were only able to complete this work when it coincided with other fieldwork. Forest priorities were such that much of the work completed by the Heritage program (>90percent) consisted of legal compliance with Section 106 of the National Historic Preservation Act (NHPA). Recent efforts to increase program staffing has resulted in greater capacity for this and other non-Section 106 requirements.

b) Are cultural resources being managed at a project-specific level in accordance with Forest Service policy of avoidance and protection or through achieving a "no adverse effect" to historic properties with a signed Memorandum of Agreement with the State Historic Preservation Officer?

Cultural resources associated with project work are typically found or revisited during National Historic Preservation Act (NHPA) Section 106 projects. For this reason, most of the cultural resource management on this forest falls within the auspices of the Region-wide Programmatic Agreement (PA). This agreement, entitled Programmatic Agreement Among the USDA Forest Service, Alaska Region, the Advisory Council on Historic Preservation, and the Alaska State Historic Preservation Officer (SHPO) Regarding Heritage Program Management on National Forest in the State of Alaska (2017), allows us to streamline many NHPA Section 106 compliance processes into a single annual report submission to the Alaska SHPO. The last annual report was provided to the Alaska SHPO in March 2023. Any project that cannot be streamlined per the stipulations of the 2017 PA are handled through the standard S106 process identified in 36 CFR 800, resulting in project-specific PAs and Memorandums of Agreement (MOAs). At the present time, we have three project-specific PAs (Kensington Mine, Greens Creek Mine, and Mendenhall Glacier Recreation Area) and several site-specific MOAs.

Are sacred sites identified and protected through regularly scheduled monitoring efforts and/or consultation with affected tribes or Indian Religious Practitioners?

The TNF Heritage Program is aware of multiple traditional cultural properties and sacred sites within the Forest based on informal consultation with our tribal partners, but none of these locations have been recorded and managed as such. These sites are currently being managed as historic properties under NHPA.

[Need a new header here... Unmonitored Questions? otherwise the table appears to be part of Question 35 when it is not]

Table 31 includes the Tongass National Forest Plan Monitoring Program monitoring questions that do not fall into the requirements in 36 CFR 219.12 (a)(5) and were not monitored in FY2020 and 2021 on the Tongass National Forest.

Table 31. Monitoring items not evaluated in detail in the report, results of any monitoring completed in FY2020 and 2021, and an explanation of why some questions were not evaluated.

Monitoring Question	Reason for not Evaluating
Question 4: Are young-growth treatments improving other key habitat components for old-growth associated species?	Same as Question 3 and covered in Required Item (ii) in the body of the report.
Question 9: What are the status and trends of areas infested by aquatic and terrestrial invasive species relative to the desired condition?	No new data collection or analysis occurred during the evaluation period.
Question 10: How effective were our management activities, including those done through partnerships, in preventing or controlling targeted invasive species?	No new data collection or analysis occurred during the evaluation period.
Question 15: What is the geographic distribution and habitat relationships of mammalian endemic species on the Tongass?	No new data collection or analysis occurred during the 2020 to 2021 sampling and evaluation period.
Question 22: Were the wetland conservation practices implemented and effective to avoid and/or minimize impacts to wetlands to the extent practicable?	No new data collection or analysis occurred during the evaluation period. The Forest Service continues to avoid and minimize impacts to wetlands to the extent practicable.
Question 23: Are the biological, mineralogical, cultural, paleontological components, and recreational values of the karst and caves maintained?	No new data collection or analysis occurred during the evaluation period.
Question 24: Are Forest lands restocked within 5 years after harvest?	All lands harvested on the forest have been successfully regenerated according to the stocking guidelines and certification standards identified in the Silvicultural Practices Handbook (FSH 2409.17)
Question 26: Are timber harvest activities adhering to applicable timber management standards and guidelines relative to: a) created openings exceeding the maximum size limit for unit harvest, b) harvest on slopes greater than 72 percent slope gradient, or c) within the 1,000 feet beach and estuary buffer?	No openings greater than 100 acres were created because of even-aged or two-aged management on the Tongass during the years of FY20 and 21. Steep slopes logged in FY20 and 21 were logged according to the mitigation required on the unit cards. That mitigation was developed from on-site analysis of slope stability and assessment of risk to downslope resources. No units were harvested within the 1,000-foot beach and/or estuary buffer.
Question 28: Are the standards and guidelines used for forest development roads and log transfer facilities effective in limiting the environmental effects to anticipated levels?	The monitoring showed that the road maintenance is limiting environmental effects from roads and log transfer facilities.
Question 29: Are roads and trails maintained in accordance with management objectives?	The 2020-21monitoring effort has shown that motor vehicle uses maps (MVUMs) have consistently made motor vehicle access prohibitions known.

Monitoring Question	Reason for not Evaluating
	The monitoring shows the roads are being maintained in accordance with their maintenance level objectives.
Question 31: Is the wilderness character being maintained?	The Tongass Wilderness Monitoring Plan will need to be reviewed for compliance with the national protocols.
Question 32: Are Wild, Scenic, and Recreational River Standards and Guidelines effective in maintaining or enhancing the free-flowing conditions and outstandingly remarkable values at the classification level for which the river was found suitable for designation as part of the National Wild and Scenic River System?	There were no projects proposed that included effects to proposed Wild, Scenic or Recreational River characteristics and no NEPA documents completed those evaluated impacts to Wild, Scenic or Recreational River characteristics.
Question 36: Are the adopted scenic integrity objectives established in the Forest Plan met?	No new data collection or analysis occurred during the evaluation period.
Question 37: What are the numbers and trends of employment in the a) wood products, b) recreation and tourism, c) mining, and d) fishing industries in Southeast Alaska?	No new data collection or analysis occurred during the evaluation period.
Question 38: What is the trend in outputs and their associated costs?	No new data collection or analysis occurred during the evaluation period.