December 17, 2019

Alaska Roadless Rule
USDA Forest Service
PO Box 21628
Juneau, AK 99802-1628

Via: www.fs.usda.gov/project/?project=54511

RE: Comments on the Proposed Alaska Roadless Rule and Draft Environmental Impact Statement

Dear Ecosystem Planning and Budget Staff,

Please accept these comments submitted on behalf of Trout Unlimited (TU) on the Draft Environmental Impact Statement (DEIS) and proposed rule for the Alaska-Specific Roadless Area Conservation Rule.

TU is the nation's largest sportsman's organization dedicated to coldwater conservation with more than 400 chapters and more than 300,000 supporters nation-wide. TU has more than 22,000 supporters in Alaska that are passionate anglers, lodge owners, fishing and hunting guides, and commercial fishermen, among other various occupations. In addition to members in more remote parts of the state, TU has active chapters in Juneau, on the Kenai Peninsula, in Anchorage and the Mat-SU, and in Fairbanks. Many of TU's members rely on the important fish, wildlife and water resources found on the Tongass and Chugach National Forests for fishing, hunting, recreation, and for employment in related industries such as fishing and tourism. From Prince of Wales Island and Misty Fjords in the south, to Yakutat and the Situk River in the north, the Tongass is a popular destination for anglers and hunters because of its salmon and steelhead runs, cutthroat trout, Dolly Varden, Sitka Black-tail deer, black bear, unique karst features, numerous public use cabins, and growing visitor services infrastructure. Likewise, the Chugach is immensely popular for residents and visitors for its fishing, hunting and outdoor recreation opportunity. In addition to our base of sport anglers, outfitters and guides, TU's membership also includes commercial fishers, Alaska Natives, small business owners, and Alaskans from a variety of walks of life.

TU has a long history of working collaboratively with the Forest Service and other stakeholders on the Tongass and elsewhere throughout the National Forest System. TU, in partnership with the Forest Service and The Nature Conservancy, played a major role in the Sal Creek restoration project on Prince of Wales Island, which was completed more than ten years

ago and helped lay the foundation for future partnership and restoration projects throughout the forest. In addition to various watershed restoration and aquatic organism passage projects throughout the Tongass, TU has been an active participant in a variety of collaborative and partnership groups active in Southeast Alaska, including the Southeast Alaska Fish Habitat Partnership and the Tongass Transition Collaborative, among others. We are actively seeking opportunities to expand our partnership with the Forest Service to the Chugach. Partnering with the Forest Service is critical to TU and to its ability to fulfill its mission. TU is committed, through the investment of significant staff and financial resources, to protecting and restoring important fish, wildlife and water resources on the Tongass, and to ensuring the region's unique wild salmon resources continue to serve as the economic, cultural and spiritual foundation of Southeast Alaska.

We commend the Forest Service for its efforts in recent years to advance the transition and move toward sustainable forest management and away from large-scale old-growth logging on the Tongass. Improving protections for important fish and wildlife habitat, enhancing visitor services, and supporting a sustainable forest products industry with a future in sustainable young-growth management will enable the Forest Service to increase its support for Southeast Alaska's rural communities and be responsive to the needs of the region. Large-scale and unsustainable old-growth timber sales undermine the region's largest job-producing industries, cause unnecessary and irreparable harm to important fish and wildlife habitat, and is an antiquated practice that would not exist if not for massive taxpayer subsidy.

I. Fishing and Recreation are the Tongass' most Important Forest Products.

The Tongass is the nation's top salmon-producing forest and a popular destination for visitors from around the globe.[1] It's many productive salmon streams, important fish and wildlife habitat, and beautiful scenery are the foundation for Southeast Alaska's local economy. Sport, commercial and subsistence fishing in Southeast Alaska contributes $1 billion annually to the regional economy and accounts for 10% of Southeast Alaska's employment.[2] In addition to this, more than 1.3 million out-of-state visitors flock to the Tongass each year, making tourism the largest source of private-sector jobs and earnings in southeast Alaska.[3] Together, the visitor and seafood industries provide 26% of all regional employment.[4] These industries have their foundation in healthy watersheds, in-tact fish and wildlife habitat, natural scenic beauty

[1] U.S. Forest Service, *Tongass Salmon Factsheet* (Mar 2017) Attachment 1, *available at* https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd554592.pdf.
[2] TCW Economics, *Economic Contributions and Impacts of Salmonid Resources in Southeast Alaska*, prepared for Trout Unlimited Alaska 16 (July 2010) Attachment 2, *available at* http://www.tu.org/sites/www.tu.org/files/documents/EconReportFull.pdf. The number of jobs supported by salmon fishing and its economic contribution are likely to be even greater today than was indicated since these figures were calculated using data from 2007 and the economy and salmon prices have continued to increase in years since.
[3] Rain Coast Data, *Southeast Alaska by the Numbers 2019*, prepared for Southeast Conference at 7 (Sep. 2019) Attachment 3, *available at* http://www.seconference.org/sites/default/files/FINAL%20Southeast%20by%20the%20Numbers%202019.pdf.
[4] *Id*. at 5.

and untouched landscapes, and depend heavily on protections afforded to inventoried roadless areas by the 2001 Roadless Area Conservation Rule.

Fishing and tourism far outpace other private-sector sources of employment and earnings. They provide a steady and reliable source of employment and earnings for many Southeast Alaskan communities. While logging once played a historically important role in the economy of Southeast Alaska, current timber industry employment accounts for just 0.7% of regional jobs.[5] Despite decreases in Southeast Alaska's timber industry, in the years after the 2001 Roadless Rule was initially promulgated Southeast Alaska's population *increased* 7 percent from 2000 to 2012 and personal income *increased* by 17 percent over the same period.[6] Per capita income for Southeast Alaskans outpaces statewide and national averages while unemployment rates remain lower than statewide or national averages.[7] Southeast Alaska's economy is buoyed by its healthy fish and wildlife habitat, productive salmon streams and scenic beauty. Managing the Tongass with fish, wildlife and visitor services at the forefront is the key to ensuring local communities and economies are strong and stable.

II. Roadless Area Protections are Essential to the Local Economy and a Successful Transition.

Two key developments in the Tongass over the past nearly two decades are responsible for the growth and strength of Southeast Alaska's fishing and tourism industries. First, the 2001 Roadless Rule was put in place to conserve the remaining wild landscapes and unroaded portions of the Tongass, which are the core of the local fishing and tourism industries. While various unsuccessful litigation efforts have been mounted against the 2001 Roadless Rule on the Tongass, and a Tongass exemption was temporarily in place before the Ninth Circuit Court of Appeals ruled it to be unlawful, the 2001 Roadless Rule has successfully conserved inventoried roadless areas on the Tongass as the law of the land for the vast majority of the past 18 years. Because of the 2001 Roadless Rule, inventoried roadless areas remain unimpacted by industrial old-growth logging and unnecessary road construction, remain reliably productive as cornerstones of the region's fishing and tourism industries, and remain accessible for fishing, hunting, recreation, guiding, and tourism.

Second, through the collaborative efforts and hard compromise of the Tongass Advisory Committee (TAC) and the 2016 amendment to the Tongass Land Management Plan (TLMP), the Forest Service has a roadmap for aligning its management of the Tongass with the public interest and the economic realities of the region. Successfully implementing this collaborative vision would allow the Forest Service to align the Tongass with the public's needs, support a sustainable young-growth forest products industry, and protect the best remaining fish and wildlife habitat on the forest—including roadless areas, the Tongass 77, and TNC/Audubon Conservation Priority Areas.

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[5] *Id*.
[6] USDA, *Tongass Land and Resource Management Plan Final Environmental Impact Statement Plan Amendment*, R10-MB-769e at 3-478 (June 2016) *hereinafter* 2016 TLMP FEIS.
[7] *Id*. at 3-478 to 479.

Timber planning, including the current proposal to repeal protections for roadless areas on the Tongass, too often comes at the expense of the region's strong economic base of fisheries and tourism. Once-productive salmon streams no longer support abundant salmon runs and ample wildlife populations when clearcut logging disrupts recruitment of large-woody debris, erosion overburdens nearby streambeds, roads cross streams and cut off salmon migration to important spawning or rearing habitat, or second-growth stands become so overgrown they fail to provide meaningful winter habitat for wildlife. Tourists and recreationists don't travel to the Tongass to see and hike through large swaths of clearcut lands. They come to take in its scenic beauty and in-tact landscapes. Each of these factors contributed to why the Forest Service adopted the original 2001 Roadless Rule and remain true today.[8]

The past 60 years of industrial logging on the Tongass has targeted the rarest and most productive stands of large-tree old-growth forest. High-grading has reducing the highest-volume contiguous old growth on the Tongass by 66 percent forest-wide.[9] On northern Prince of Wales Island, where large-scale old-growth logging has been most intense, 94 percent of the contiguous large-tree old-growth stands have been logged since 1954.[10] This contiguous large-tree old-growth forest, which historically covers less than five percent of the Tongass, is among the most valuable habitat for fish and wildlife. Past logging and road building has left a legacy on the Tongass where, according to Forest Service estimates, roughly 65 watersheds are in need of significant restoration with an estimated cost of more than $100 million to address the backlog of unmet watershed restoration needs.[11] The backlog of road maintenance needs on Alaska's National Forests amounts to $68 million, begging the question of why we would compound these problems through expanded road construction in new areas.[12] Approximately a third of all instances on the Tongass where roads intersect streams fail to meet applicable standards for salmon migration.[13]

III. The Propose Rule is out of Touch with the Needs of the Public.

The overwhelming weight of public input recognizes the extraordinary value of roadless areas on the Tongass and a desire to keep the 2001 Roadless Rule's important protections in

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[8] *See* Special Areas; Roadless Area Conservation, 66 Fed. Reg. 3244, 3245-47 (Jan. 12, 2001).
[9] Albert, D. M., and J. W. Schoen, *Use of Historic Logging Patterns to Identify Disproportionately Logged Ecosystems within Temperate Rainforests of Southeastern Alaska*, 27 Conservation Biology 4 at 779-780 (2013) Attachment 4; Albert, D. M., and J. W. Schoen, *A conservation assessment for the coastal forests and mountains ecoregion of southeastern Alaska and the Tongass National Forest* In A Conservation Assessment and Resource Synthesis for the Coastal Forests & Mountains Ecoregion in Southeastern Alaska and the Tongass National Forest. eds J. W. Schoen, and E. Dovichin. Audubon Alaska and The Nature Conservancy (2007), *available at* https://www.conservationgateway.org/ConservationByGeography/NorthAmerica/UnitedStates/alaska/seak/era/cfm/Pages/CA-AKCFM.aspx.
[10] *Id*.
[11] USDA, *Investment Strategy in Support of Rural Communities in Southeast Alaska 2011-2013*, R10-MB-734 at 11 (Nov. 2011) Attachment 5, *available at* https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5339075.pdf.
[12] U.S. Forest Service, *Questions for Mr. Quigley* at 1 (June 2018) Attachment 6.
[13] U.S. Forest Service, *2016-2017 Tongass National Forest Monitoring and Evaluation Report* at 3 Attachment 7.

place. Numerous tribes and communities have passed resolutions or spoken out in favor of protecting roadless areas on the Tongass. Many affected businesses in the fishing, hunting and tourism industries also support protecting roadless areas.[14] Public comment at the public meetings for the proposed exemption overwhelmingly favored retaining the 2001 Roadless Rule. In some communities, 100% of the public comment supports protecting roadless areas. Recent polling shows 79% of Alaskans and a comparable number of southeast Alaskans want to either keep the 2001 Roadless Rule as it is, or to make minor changes that are offset by increased conservation measures for important fish and wildlife.[15] Similarly, the majority of public comments to the Forest Service during the scoping period opposed changing the 2001 Roadless Rule for Alaska.[16] The scientific community also recognizes the importance of the 2001 Roadless Rule and the extraordinary value of the remaining big-tree old-growth, and has repeatedly called on the Forest Service to end its old-growth timber sale program.[17]

When evaluating the benefits from the Tongass to society, the Forest Service and the State of Alaska are placing far too much emphasis on traditional extractive resources while largely ignoring benefits from fish, wildlife, subsistence, recreation, water resources, and carbon storage. By far the most valuable activities occurring on the Tongass are derived from intact fish and wildlife habitat and wild scenery. This is true throughout the National Forest System, but is especially relevant in Southeast Alaska where the Tongass comprises such a large portion of the land base and where the forest's roadless qualities play such an integral role in southeast Alaska's businesses, economy and lifestyle. Maximizing the benefits from the Tongass to the public requires the Forest Service to manage the Tongass in a way that prioritizes the many contributions of fish, wildlife and visitor services—all of which primarily derive from inventoried roadless areas.

In addition to safeguarding important fish, wildlife, subsistence, and recreational resources throughout roadless areas in the Tongass, the 2001 Roadless Rule also provides reasonable accommodation to community development and infrastructure needs. The 2001 Roadless Rule provides access for mining, energy, and community infrastructure projects. It allows forest health, recreation, and cultural activities. The Kake-Petersburg Intertie and the Blue Lake Hydropower Project Expansion, which opponents of the 2001 Roadless Rule often cite as being obstructed by the rule, are explicitly allowed by court order along with a variety of

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[14] *See* Business Letter to Secretary Perdue and Chief Christiansen (Dec. 16, 2019) Attachment 8.
[15] *See* Tulchin Research, *Poll Findings: Alaska's Tongass National Forest* at 7 (May 2019) Attachment 9, *available at* http://www.americansalmonforest.org/uploads/3/9/0/1/39018435/ak_tongass_trout_unlimited_final.pdf.
[16] U.S. Forest Service, *Alaska Roadless Rule Scoping Period: Written Public Comment Summary* at 2 (Feb. 2019) *available at* https://www.fs.usda.gov/nfs/11558/www/nepa/109834_FSPLT3_4616651.pdf.
[17] *See* Jack Ward Thomas and Mike Dombeck, Seattle Times Op Ed, Declare harvest of old-growth off-limits and move on (Aug 23, 2003); Letter to the President by 78 North American Scientists (lead signatories were Jack Ward Thomas and Mike Dombeck) calling for a national old growth policy to protect the remaining old growth on national forest lands throughout the US (June 25, 2014); Letter to Secretary Vilsack from 200+ North American Scientists urging a quick transition out of old-growth logging on the Tongass National Forest (October 15, 2014); Joint Society letter to Secretary Vilsack from American Fisheries Society (AK Chapter), American Ornithologist's Union, American Society of Mammalogists, Ecological Society of America, Pacific Seabird Group, Society for Conservation Biology, The Wildlife Society (January 20, 2015).

other high-profile projects.[18] As of June, 2019, all 58 applications submitted for projects in roadless areas in Alaska had been approved, most gaining approval within a month.[19] The majority of these applications pertain to surface exploration of potential mining and hydropower projects, but they also include road realignment and reconstruction projects, an aerial tram, a geothermal project, personal use of timber, and a variety of other projects. In October, 2018, the process for approving these projects was further streamlined when Forest Service Chief Christiansen delegated authority to approve project requests to the Regional Foresters.[20]

In many regards, Southeast Alaska has already transitioned. More than one-in-four jobs in Southeast Alaska are in either the fishing or tourism industries.[21] Even when timber from private and state lands is included, the timber industry in Southeast Alaska accounts for just a few hundred jobs.[22] While timber harvesting once played a historically important role in the economy of Southeast Alaska, the future of the Tongass timber program is in planning and implementing appropriately-scaled timber sales that support and encourage local manufacturing of young-growth forest products while also restoring managed stands in previously-harvested areas. If the Tongass is to truly support the local and regional economy, its management—and especially the management of its roadless areas—must place fishing and tourism industries at the forefront and to in every way possible avoid or minimize impacts to fish and wildlife habitat.

Exempting the Tongass, or even portions of inventoried roadless areas on the Tongass, from the protections afforded by the 2001 Roadless Rule will undercut the Tongass Transition, erode public confidence and trust in the Forest Service, serve as unnecessary obstacles to the creation of a sustainable forest products industry in the region, and undermine the economic lynchpins of Southeast Alaska's fishing and tourism economy. As the Forest Service itself notes, outfitters, guides and recreation-related businesses are the losers as a result of this rulemaking, likely losing hundreds of thousands of dollars per year, if not more.[23]

For at least a decade, from the Log Jam timber sale in 2009 to today's Central Tongass Project, the Forest Service has justified old-growth timber sales on the Tongass as "bridge timber" that are necessary to encourage the transition to young-growth forest products. A similar line of thinking permeated the TAC and the 2016 TLMP amendment, where industrial old-growth logging was justified to maintain the existing timber industry and capacity only until large volumes of young-growth timber becomes commercially viable and the arrival of the highly anticipated "wall of wood."

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[18] *See* U.S. District Court, District of Alaska, Judgement, *Organized Village of Kake v. USDA*, 1:09-cv-00023-JWS at 2-3 (May 24, 2011) Attachment 10.
[19] U.S. Forest Service, *Frequently Asked Questions Regarding Inventoried Roadless Areas* 6 (Jan. 2018) Attachment 11; U.S. Forest Service, *supra* note 12, at 1.
[20] U.S. Forest Service, *supra* note 12, at 1.
[21] *See* Rain Coast Data, *supra* note 3, at 4.
[22] *See id*. at 4.
[23] U.S. Forest Service, *Alaska Roadless Rulemaking Regulatory Impact Assessment and Cost-Benefit Assessment* 32 (Oct. 2019) *available at* http://www.fs.usda.gov/nfs/11558/www/nepa/109834_FSPLT3_4876769.pdf.

Exempting the Tongass from the 2001 Roadless Rule disrupts the transition and greatly expands the suitable old-growth timber base, undoes years of progress built on public trust and collaboration, will have irreversible negative impacts to the remaining important fish and wildlife habitat on the forest, and set the transition and the Tongass back decades. Rather than creating large new exemptions to roadless area protections that encourage the timber industry to dig in its heels against the tides of change and to continue cutting as much valuable old-growth timber as possible, the Forest Service should conserve roadless areas on the Tongass and encourage investment in transition technologies and entrepreneurship within the Tongass timber industry.

IV. The Forest Service has Failed to Provide Adequate Opportunity for Public Input and Failed to Address Issues Raised in Scoping.

The Forest Service has needlessly rushed this rulemaking, has not provided adequate notice and opportunity for public input, and has not been responsive to the input it has received. Unlike the processes employed in development of the original 2001 Roadless Rule or the Colorado or Idaho state-specific rules, all of which allowed for diverse stakeholder input from the outset, the rulemaking for the Alaska Roadless Rule has been driven by special interests and the State of Alaska.

The Forest Service has improperly relied on the State of Alaska's Citizen Advisory Committee (CAC) as if it was a duly convened federal advisory committee, which it is not. The CAC was hastily convened without any of the procedural safeguards that apply to committees convened through the Federal Advisory Committee Act. Its membership failed to include anyone from the tourism or visitor services industry, failed to include anyone operating on the Tongass through a special use permit, failed to include anyone from the sport fishing or hunting industries, failed to include anyone with scientific or technical expertise, and was heavily skewed toward resource extractive industries such as logging.[24] Many of its members had limited understanding of the Roadless Rule and did not have the resources to make an informed decision, such as information on existing commercial operators on the forest. As such, it had only a narrow view of the issues at stake and a relatively poor understanding of how the Roadless Rule functioned on the Tongass.

Despite these shortcomings, the Forest Service is treating the CAC as if it was a federal advisory committee. Each of the alternatives closely mirror the options forwarded to it by the CAC, even where those options conflict with input from the public, other cooperating agencies, or from the TAC's recommendations during the 2016 TLMP amendment. In addition, as has been widely reported, it's clear Alaska Governor Dunleavy convinced President Trump to direct

[24] *See* Alaska Roadless Rule Citizens Advisory Committee, *Final Report to the Governor and State Forester*, *State of Alaska* at 15 (Nov. 2018) *available at* https://s31207.pcdn.co/wp-content/uploads/sites/6/2019/11/Alaska-Roadless-Rule-Citizen-Advisory-Committee-Final-Report_11.21.2018.pdf.

the Forest Service to undertake a full exemption even before the DEIS was made public.[25] This is predecisional. The Forest Service has allowed the State of Alaska to unduly influence this process while ignoring the overwhelming public comment in support of protecting roadless areas on the Tongass.

V. The Proposed Rule will not be "durable" and fails to Satisfy the Purpose and Need of the Rulemaking.

The purpose and need for this rulemaking is to achieve "a long-term, durable approach to roadless area management . . . that accommodates the unique biological, social and economic situation in and around the Tongass."[26] In order to satisfy this purpose and need, any new rule, if one is promulgated, must have broad support from diverse stakeholders throughout the region, including conservation interests and the fishing and tourism industries, while also being responsive to criticisms of the 2001 Roadless Rule, whether real or perceived. Unfortunately, the Forest Service has taken little effort to address criticisms of the 2001 Roadless Rule that are merely of perception and that could be remedied through efforts short of a new rulemaking and has proposed the most extreme option available. The Forest Service is advancing a proposed rule that is the product of undue political pressure from special interests instead of collaboration and compromise.

When the Forest Service first announced it was considering changes to the 2001 Roadless Rule in Alaska, TU was among a group of businesses and organizations that reached out to the Forest Service and State of Alaska expressing interest in finding a compromise that retained the core conservation principles of the Roadless Rule while alleviating concerns of its critics. At its core, while we support the 2001 Roadless Rule and do not believe an Alaska-specific rule is necessary, our suggestion was to develop a rule that: (1) provided a limited exemption for the "roadless roadless"; (2) expanded roadless area protections to those portions of the Tongass 77 and TNC/Audubon Conservation Priority Areas that are outside inventoried roadless areas; and (3) clarified that roads and tree harvest are allowed where reasonably necessary for essential infrastructure projects, energy generation projects, mining, and transportation projects.

Had the Forest Service developed and advanced an alternative based on input through a robust public process like that used for the Idaho or Colorado rules, it could have arrived at a durable solution. Unfortunately, the Forest Service has instead bent to the will of the State of Alaska and the old-growth logging industry, which are unwilling to accept anything less than a full repeal of the 2001 Roadless Rule on the Tongass. Conflict and controversy are mounting as a result and, if the proposed rule becomes final, litigation is sure to follow. Rather than

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[25] *See* The Washington Post, *Trump Pushes to Allow new Logging in Alaska's Tongass National Forest* (Aug. 27, 2019) Attachment 12, *available at* https://www.washingtonpost.com/climate-environment/trump-pushes-to-allow-new-logging-in-alaskas-tongass-national-forest/2019/08/27/b4ca78d6-c832-11e9-be05-f76ac4ec618c_story.html.
[26] U.S. Forest Service, *Draft Environmental Impact Statement Rulemaking for Alaska Roadless Areas* at ES-2 (Oct. 2019) *hereinafter* DEIS.

achieving a durable and lasting result that puts conflict behind us, this proposed rule douses the remaining embers of the timber wars with fuel.

VI. The Tongass 77 and TNC/Audubon Conservation Priority Areas are Important for Fish and Wildlife and Should be Conserved.

Various areas have been identified as especially important for fish and wildlife and deserve continued protection under any future Alaska-specific roadless rule. These areas include the Tongass 77 (commonly referred to as the T77) and areas identified by the Audubon/TNC Eco-regional Conservation Assessment as either Conservation Priority or Core Integrated Management Watersheds (commonly referred to as TNC/Audubon Conservation Priority Areas). These areas, along with roadless areas, were specifically recognized by the TAC, which recommended they be off-limits to future old-growth logging.[27] The 2016 TLMP amendment sought to implement the TAC's recommendations by identifying these areas as NOT suitable for old-growth logging.[28]

Any Alaska-specific roadless rule should reinforce the TAC recommendations and the 2016 TLMP amendment by protecting the entire Tongass 77 and all TNC/Audubon Conservation Priority Areas, including those that are outside inventoried roadless areas. These protections should be as robust and as flexible as protections afforded inventoried roadless areas by the 2001 Roadless Rule while still allowing recreation, outfitters and guides, cultural and subsistence activities, and projects designed to restore forest health. If the Forest Service finalizes an Alaska-specific Roadless Rule, TU encourages extending the Watershed Priority to Tongass 77 and TNC/Audubon Conservation Priority Areas outside the existing roadless inventory, as is proposed as a component of Alternative 3.

The Tongass 77 are the "best of the best" from the thousands of salmon and trout watersheds on the Tongass. These areas were identified through a comprehensive process where researchers from the Alaska offices of the Audubon Society, The Nature Conservancy and Trout Unlimited, in consultation with federal and state biologists and various community and business stakeholder groups, identified the most important salmon-producing watersheds that lacked watershed-scale protections. Now narrowed down to 73 watersheds comprising

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[27] Tongass Advisory Committee, *Tongass Advisory Committee Final Recommendations* at 13 (Dec. 2015) Attachment 13, *available at* http://www.merid.org/~/media/Files/Projects/tongass/December%202015%20Meeting/Tongass%20Advisory%20Committee%20Final%20Recommendations_Dec%202015.pdf. While some former members of the TAC appear to now characterize the TAC's final recommendations as not unanimous or as not supporting the conclusion that the Tongass 77 should be off limits to old-growth logging, those comments contradict the well-established record of the TAC and the 2016 TLMP amendment. As the TAC's final recommendations clearly state, "The TAC agrees that the USFS should: . . . Limit the old growth timber base to the current definition of Phase I lands outside of The Nature Conservancy (TNC)/Audubon conservation priority areas, Tongass 77 (T77) watersheds and Inventoried Roadless Areas." *Id*. While the TAC was instructed by the USDA and Forest Service to limit its recommendations to what was possible within the 2001 Roadless Rule, no similar direction was provided to the TAC for the Tongass 77 or TNC/Audubon Conservation Priority Areas, which were taken up by the TAC on its own accord.

[28] USDA, *Tongass National Forest Land and Resource Management Plan*, R10-MB-769g at A-5 (June 2016) *available at* https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd527907.pdf.

not quite 1.9 million acres,[29] the Tongass 77 form the backbone of Southeast Alaska's salmon fishery and the play a vital role on Southeast Alaska's local economy. The Tongass 77 enjoys support from more than 300 businesses and organizations, most of which are based in Southeast Alaska.[30] 7,233 individuals, 3,636 of which resided in Southeast Alaska, voiced support for protecting the Tongass 77 and making these areas off limits to logging during planning for the 2016 TLMP amendment.[31]

Like the Tongass 77, TNC/Audubon Conservation Priority Areas are hugely important to local fish and wildlife populations. These areas were identified through a thorough peer-review process conducted by scientists from Audubon Alaska and The Nature Conservancy.[32] These areas are the most ecologically valuable areas for a diverse array of plant and animal species and their conservation is essential to the ecological health and function of Southeast Alaska.

Fish and wildlife, and Southeast Alaska's broad expanses of untracked land and scenic beauty, are the underpinnings of our local economy, culture, and community. Salmon and trout—and the communities, cultures and economies they sustain—require clean, healthy watersheds for spawning, rearing and migrating. Based on the outstanding fish and wildlife habitat values in the Tongass 77 and TNC/Audubon Conservation Priority Areas, and their incredible importance to local communities and the region's economy, these areas deserve special protection from future development in any new Alaska-specific rule developed by the Forest Service.

VII. The DEIS Fails to Take a Hard Look at Impacts to Fish and their Habitat.

The National Environmental Policy Act (NEPA) requires the Forest Service to take a hard look at the potential direct, indirect and cumulative effects of the proposed rule.[33] This must include effects and impacts that are "ecological (such as the effects on natural resources and on the components, structures, and functioning of affected ecosystems), aesthetic, historic, cultural, economic, social, or health, whether direct, indirect, or cumulative."[34] Yet, the DEIS consistently underplays the potential impacts, makes numerous conclusions that are unsupported by the best available science, and fails to incorporate numerous relevant scientific studies. Because of these shortcomings, the DEIS is inadequate for an informed impacts analysis.

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[29] *See* Trout Unlimited, *The Tongass 77, Protecting Southeast Alaska's Best Salmon Watersheds* (Mar. 2, 2016) Attachment 14, *available at* http://www.americansalmonforest.org/uploads/3/9/0/1/39018435/t77_4-pager_summary_-_20160302.pdf.
[30] *See* List of Tongass 77 supporters, *available at* http://www.americansalmonforest.org/t77-supporters.html.
[31] *Id*.
[32] *See* Albert, D. M., and J. W. Schoen, *A conservation assessment for the coastal forests and mountains ecoregion of southeastern Alaska and the Tongass National Forest* In A Conservation Assessment and Resource Synthesis for the Coastal Forests & Mountains Ecoregion in Southeastern Alaska and the Tongass National Forest. eds J. W. Schoen, and E. Dovichin. Audubon Alaska and The Nature Conservancy (2007), *available at* https://www.conservationgateway.org/ConservationByGeography/NorthAmerica/UnitedStates/alaska/seak/era/cfm/Pages/CA-AKCFM.aspx.
[33] *See* 40 C.F.R. § 1502.16.
[34] *Id*. at § 1508.8.

The DEIS fails to adequately asses the current status of fishes and fish habitat on the Tongass, to discuss how the current status relates to historic abundance, and to analyze how the proposed action will affect fisheries, fish habitat, and the important waters that support these resources. Underlying the DEIS, and made explicit by various statements of Forest Service officials at public meetings, is the misguided belief that expanding logging and logging roads into roadless areas will have no effect on fish and fish habitat. This assertion is conclusory and unsupported by the scientific record and common sense.

First, the Forest Service seems to take the position that, while the proposed rule will give it more flexibility to plan logging in new places, the exemption will not lead to more logging. The State's petition and the various comments by Alaska's elected officials and industry proponents make clear that the motivation for the exemption is to revitalize and expand the failing old-growth logging industry. The old-growth logging industry has already high graded the economically viable timber stands. Forest wide, 66.5% of the Tongass' contiguous high-volume stands have been logged. On northern Prince of Wales Island, where logging has been most intense, 93.8% of the contiguous high-volume stands have been logged.[35] The old-growth logging industry has already cut nearly all the economically viable forest it has access to on the Tongass and must expand into new roadless areas if it is to continue.

Second, the Forest Service maintains TLMP provides a second layer of protection by identifying most roadless areas as "not suitable" for logging. However, as part of this rulemaking the Forest Service also proposes making an administrative change to the forest plan to reclassify 185,000 acres as suitable for logging. 165,000 of those acres are old-growth forest and 20,000 of those acres are young-growth forest, all of which will newly be available for logging if this proposed rule becomes final. Additionally, the Forest Service often amends the Forest Plan on a project-by-project basis to make new areas suitable, which it likely would do in the future to make new lands available for logging beyond the initial 185,000 acres.

Third, the Forest Service suggests that standards and guides in TLMP, such as stream buffers that prohibit logging within 100 feet of a salmon stream, adequately protect salmon even where logging is allowed. However, as we've seen in the Tongass and elsewhere, logging and logging roads lead to sedimentation, higher stream temperatures, lack of large woody debris recruitment, migration barriers, and a variety of other impacts that degrade habitat and reduce salmon productivity. Additionally, standards and guidelines on the Tongass lag behind what the Forest Service requires on other salmon-producing national forests, including those managed under the Northwest Forest Plan where the Forest Service requires 300-foot buffers.

Fourth, although the DEIS seems to acknowledge that roads are the largest source of sediment to salmon streams,[36] and a recent monitoring and evaluation report identified a third

[35] *See* Albert and Schoen, *supra* note 9, at 779-780.
[36] DEIS at 3-112.

of all bridges and culverts across salmon streams on the Tongass fail to meet applicable fish passage standards,[37] the DEIS fails to assess the impacts associated with additional road construction necessary to support logging activities in new portions of the Tongass. As the DEIS notes, "road-crossing structures have been common partial or complete barriers to fish movement in much of the developed areas where fish are present,"[38] "roads pose the greatest risk to fish resources on the Tongass,"[39] and "Roads have been found to contribute more sediment to streams than any other land management activity."[40] Even if the rate of logging stays within the projections contemplated by the 2016 TLMP amendment, for which there is no guarantee, road construction must increase under the proposed rule in order to facilitate logging in areas currently inventoried as roadless. Yet, the DEIS erroneously states that "new road construction would be similar under all alternatives"[41] and that the proposed rule will have "Neutral/No Effect" on fisheries.[42]

This proposed rule will allow industrial clear-cut logging of old growth forest to expand into new areas. This expansion will require more road construction and reconstruction. Additionally, the rate and footprint of logging operations is likely to increase through subsequent plan amendments and due to new economically viable timber becoming available. These expansion areas will be the best remaining economically viable stands of old-growth forest, which are also the most important places for salmon and other fish and wildlife species. Logging and road building in these expanded areas will impact salmon, resident fishes, nearby wildlife, and their habitat. The Forest Service ignores these realities and fails to take a hard look at these impacts. The DEIS does not satisfy the requirements of NEPA and must be revised.

VIII. The DEIS Fails to Take a Hard Look at Impacts to Tourism and Recreation.

The DEIS and supporting materials fail to account for existing tourism and recreation activities on the Tongass, fail to account for future growth in those activities, and as a consequence fail to take a hard look at reasonably foreseeable impacts to tourism and recreation. The DEIS lists the small cruise vessel capacity and notes that 242 permitted outfitters and guides operated on the Tongass between 2013 and 2017,[43] but somehow concludes the proposed rule will have minimal to no effect on those activities.[44] Additionally, the DEIS dismisses likely impacts to "other popular recreation and tourism activities, such as saltwater fishing, sea kayaking, and shopping" because they "do not take place on the Tongass" and the forest merely provides "a backdrop for these activities."[45] This assertion is unsupported.

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[37] U.S. Forest Service, *supra* note 13, at 3.
[38] DEIS at 3-110.
[39] *Id*. at 3-112.
[40] *Id*.
[41] *Id*. at 3-113.
[42] *Id*. at 2-25.
[43] *Id*. at 3-39.
[44] *Id*. at 2-25.
[45] *Id*. at 3-41.

The proposed rule would expand logging and logging roads into new part of the Tongass that are currently undeveloped. Many of these roadless areas are the foundation for local outfitter and guide businesses, tour companies, and are popular with recreationists. Outside of general observations about the volume of use on the Tongass, the Forest Service provides no meaningful accounting of existing or foreseeable future use, where that use occurs on the forest, and makes no meaningful assessment of how that use will be impacted or displaced by expanded logging activities and new logging roads. The Forest Service must undertake a meaningful assessment of how expanding logging activities into new parts of the forest will impact and displace existing forest users. The Forest Service must also consider how this expanded logging will curb growth in the tourism and recreation sector. A new revised or supplemental DEIS is necessary to address these shortcomings.

IX. Additional Specific Comments on the Proposed Rule and Action Alternatives.

TU supports Alternative 1 and encourages the Forest Service to take "no action." However, the following comments are provided on the various action alternatives.

a. "Logical Extensions" Should Avoid the Tongass 77 and TNC/Audubon Priority Areas.

Alternative 3 exempts "substantially-altered roadless areas" and modifies roadless boundaries to allow logging up to the "logical end points of existing road and timber harvest units" in areas currently inventoried as roadless.[46] These logical extensions are sprinkled throughout the forest. While TU opposes exempting any of the logical extensions, many of them are especially problematic because they are located in high-value areas for fish, wildlife and/or recreation. The below chart outlines the most problematic logical extensions. These logical extensions should not be included in Alternative 3 or, at a minimum, reduced in size to eliminate the conflict.

General Location	VCU	Conflict
Yakutat	3640, 3641, 3660, 3720	Overlap with T77 and TNC/Audubon
Kadashan, South of Tenakee Springs	2400, 2430, 2460	Overlap with T77 and TNC/Audubon
Upper Tenakee Inlet	2220, 2230	Tenakee supports the roadless rule
Kruzof Island, west of Sitka	3080, 3090	Sitka supports the roadless rule; Overlap with the T77 and TNC/Audubon
North Kuiu Island	4000, 4010, 4200, 4210, 4280	Kake supports the roadless rule; overlap with T77 and

[46] *Id*. at 2-12.

		TNC/Audubon; history of controversial timber sales
Western Kupreanof Island	4290, 4360, 4380, 4400	Overlap with T77 and TNC/Audubon
Northern Kupreanof Island	4240, 4420, 4430	Popular small ship anchorage for outfitters, guides, and small cruises; overlap with T77 and TNC/Audubon
Wrangell Island	4790	Overlap with T77 and TNC/Audubon
Etolin Island	4670, 4680	Overlap with T77 and TNC/Audubon
Deer Island	5250	View/scenery for small cruises; overlap with T77 and TNC/Audubon
Bradfield Canal	5200, 5210	Popular for recreation and tourism, outfitters and guides, bear viewers and Anan
Thorne Island, near Whale Pass	5510	Overlap with TNC/Audubon
Naukati/Coffman Cove	5541, 5542, 5730	Overlap with T77 and TNC/Audubon
South Prince of Wales, East of Hydaburg	6180, 6740, 6750, 6780	Overlap with T77 and TNC/Audubon

b. Timber Harvest and Roads Should not be Allowed for Experimental Forests in Roadless Areas.

Alternatives 2 through 5 would allow timber harvest and road construction or reconstruction in designated experimental forests for research or administration.[47] However, this allowance is inconsistent with the protection or roadless values and should not be included in the final rule. Any research or administrative activities that rely on timber harvest or road construction and reconstruction should occur outside inventoried roadless areas.

c. Timber Harvest and Roads Should not be Allowed for Fishways, Hatcheries or Aquaculture Facilities.

Alternatives 2 through 5 would allow road construction or reconstruction in conjunction with fishways, hatcheries or aquaculture facilities in roadless areas and/or community priority areas.[48] However, this allowance is inconsistent with the conservation of roadless values and should not be included in the final rule. Unless the road construction or reconstruction is

[47] *Id*. at 2-7.
[48] *Id*. at 2-7 and 2-8.

necessary pursuant to a pre-existing right, any hatcheries or aquaculture facilities should be sited to avoid road construction or reconstruction in roadless areas.

d. Commercial Timber Harvest and Logging Roads Should be Prohibited in Community Priority Areas.

Alternative 3 would allow commercial timber sales and associated logging roads in community priority areas where the volume is less than 1 million board feet (mmbf) of timber.[49] This leaves the door open for a series of commercial timber sales of unlimited volume and unlimited new road construction so long as each individual sale is less than 1 mmbf. In effect, this invites segmentation, undermines the purpose of community priority areas, and fails to conserve the important roadless values. This language should not be included in the final rule. Commercial timber sales and logging roads should be prohibited in community priority areas.

e. Timber Harvest Associated with Biomass Production Should be Prohibited in Community Priority Areas.

Alternative 3 would allow timber harvest where "needed for the construction, expansion, utilization or maintenance of . . . biomass heating and energy systems" and "other renewable energy projects" in Community Priority Areas.[50] If adopted as part of the final rule, this language should be changed to clarify that timber harvest is allowed only when incidental to construction of the generation facility and prohibited if done in order to provide a supply of biomass fuel. Timber harvest to fuel a biomass facility must comply with any and all restrictions applicable to traditional commercial logging activities.

f. Timber Harvest Associated with Alaska Native Customary and Traditional Uses Should be Allowed.

TU supports allowing timber harvest for Alaska Native customary and traditional uses, such as for the harvest of individual trees for totems, in roadless areas when consistent with maintaining and conserving roadless characteristics. Associated road construction and reconstruction should be prohibited.

g. Timber Priority Alaska Roadless Areas Should not be Allowed.

Alternative 4 would allow timber harvest and road construction or reconstruction in timber priority roadless areas.[51] Establishing Timber Priority Alaska Roadless Areas is inconsistent with the conservation or roadless values and should not be allowed. This roadless

[49] *Id*. at 2-8.
[50] *Id*.
[51] *Id*.

classification should not be part of the final rule. Commercial logging and logging roads should be allowed only outside inventoried roadless areas.

h. Administrative Changes to TLMP.

Alternatives 2 through 6 propose administrative changes to the 2016 TLMP amendment to change 185,000 acres of the Tongass from not suitable for timber production to suitable.[52] These changes are inappropriate for this rulemaking. The purpose and need does not contemplate changes to TLMP, this was not an issue significantly raised during scoping, and is not an issue that has been adequately noticed during the public comment period for the DEIS.

The 2016 TLMP amendment was the product of years of collaboration and compromise among diverse stakeholders that struck a careful balance among conservation and resource extraction interests. Unlike the ongoing roadless rulemaking, which relies on input from a non-representative stakeholder group convened by the State of Alaska, the 2016 TLMP amendment is based on recommendations from the TAC, a duly convened federal advisory committee that complied will all procedural and substantive requirements of the federal advisory committee act.[53] At its core, the TAC recommended phasing out large-scale old-growth logging over a 16-year period, easing standards and guides to allow increased access to young-growth timber as a way of encouraging the transition away from old-growth logging, and protecting important areas from future logging, including roadless areas, the Tongass 77, and TNC/Audubon Conservation Priority Areas.[54] The TAC was clear that its recommendations must be taken as a whole and not adopted partially or in a piecemeal manner.

Changing the suitability determination in the 2016 TLMP amendment undermines the robust and collaborative process that was employed in achieving its careful compromise. This is especially true where, as here, the Forest Service proposes changes to the forest plan without undertaking a similarly robust or collaborative process. If the Forest Service desires to undertake changes to the forest plan, it must do so separately from proposed changed to the 2001 Roadless Rule, with proper public notice that such changes are being contemplated, and with a robust process on par with the process used with the TAC.

i. The Final Rule Should not Include Language Affecting the Chugach National Forest.

There is no reason for the Forest Service to include the Chugach National Forest in its final rule and all language affecting the Chugach should be removed. The State of Alaska's petition was clear that it requested action regarding the Tongass.[55] It did not request action

[52] *Id*. at 2-2.
[53] Tongass Advisory Committee, *supra* note 27, at 13.
[54] *Id*.
[55] Mack, Andrew T, Commissioner Alaska Department of Natural Resources, *State of Alaska Petition for USDA Rulemaking to Exempt the Tongass National Forest from Application of the Roadless Rule and other Actions* (Jan 2018).

affecting the Chugach.[56] Similarly, although the Forest Service has often referred to the rulemaking as for an "Alaska Roadless Rule," the Forest Service has given every indication it was limiting its consideration to the Tongass and not considering changes affecting the Chugach. Upon releasing the DEIS, the Forest Service press release repeatedly mentions the Tongass and states "The Chugach National Forest would remain under the 2001 Roadless Rule."[57]

Despite the Petition's clear limitation to the Tongass, and public statements by the Forest Service that proposed changes were limited to the Tongass, the Forest Service has nonetheless proposed changes that significantly undermine roadless area protections on the Chugach. These changes are two-fold:

First, the Forest Service proposes creating a mechanism to allow "administrative corrections" to roadless boundaries in the Chugach following public notice and 30-day comment period.[58] These changes are unnecessary because the 2001 Roadless Rule clearly contemplates corrections when it defines "Inventoried roadless areas" as "Areas identified in a set of inventoried roadless areas maps, . . . *or any subsequent update or revision of those maps.*"[59] Instead of creating a new regulation for the Chugach and extending the Alaska roadless rulemaking beyond its scope, the Forest Service should work within the existing 2001 Roadless Rule to address any administrative corrections that might be appropriate for the Chugach.

Second, the Forest Service proposes creating a mechanism to modify the classification and boundaries of roadless areas on the Chugach after public notice and a 45-day comment period.[60] This second provision would create a loophole in roadless conservation so great as to render roadless area protections in the Chugach meaningless. Any future project, even a massive timber sale, could be allowed in roadless areas on the Chugach through a simple reclassification or boundary modification. Except for the requirement for a simple notice and comment period, such as is required for any large project anyway, there is no limit to what can be allowed in roadless areas of the Chugach and no standard for when the reclassification or boundary modification is appropriate. Even if the Forest Service decides to retain the first subpart of the Chugach section, this second provision must be excluded.

Modifying the 2001 Roadless Rule for the Chugach is unnecessary, is inconsistent with the conservation of roadless areas, and is especially inappropriate here since the Forest Service has repeatedly assured the public there will be no changes to the Chugach. If the Forest Service desires to modify how roadless areas on the Chugach are managed, it must initiate a new rulemaking with proper notice and scope to include the Chugach.

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[56] *See id*.
[57] U.S. Forest Service, *USDA Forest Service Seeks Public Comment on Draft Environmental Impact Statement, Alternatives to a Proposed Alaska Roadless Rule* at 2 (Oct. 15, 2019) *available at* https://www.fs.usda.gov/nfs/11558/www/nepa/109834_FSPLT3_4876053.pdf.
[58] *See* 84 Fed. Reg. 55528-29 (Oct. 17, 2019).
[59] 36 C.F.R. § 294.11 (*emphasis added*).
[60] *See* 84 Fed. Reg. 55529 (Oct. 17, 2019).

X. Conclusion.

The proposed Alaska Roadless Rule, which would fully exempt the Tongass and create misguided loopholes for the Chugach, is a huge leap backward and risks undoing much of the progress gained through compromise and collaboration in recent years. It turns its back to Southeast Alaska's economic strengths—fishing, tourism and outdoor recreation—which now account for 26% of regional employment and $2 billion to the local economy. It also short changes the values that make the Tongass so unique and valuable to local residents and visitors alike.

Roadless areas on the Tongass are some of the best and most valuable lands on the forest. Many of the most important salmon streams are in roadless areas. Increasingly scarce winter deer range and prime bear habitat is often found in low elevation roadless areas. Roadless areas offer the right combination of beautiful scenery, wild landscapes, fish and wildlife, and access that local residents and the growing tourism and recreation industry demands. The Tongass is a paradise—not just for Alaskans, but for all Americans. The Forest Service should abandon its proposed exemption and, instead, continue long-standing protections for roadless areas.

Thank you for the opportunity to provide input into this planning process. Please do not hesitate to contact me by email at awilliams@tu.org or by phone at 907.227.1590 if you have any questions.

Sincerely,

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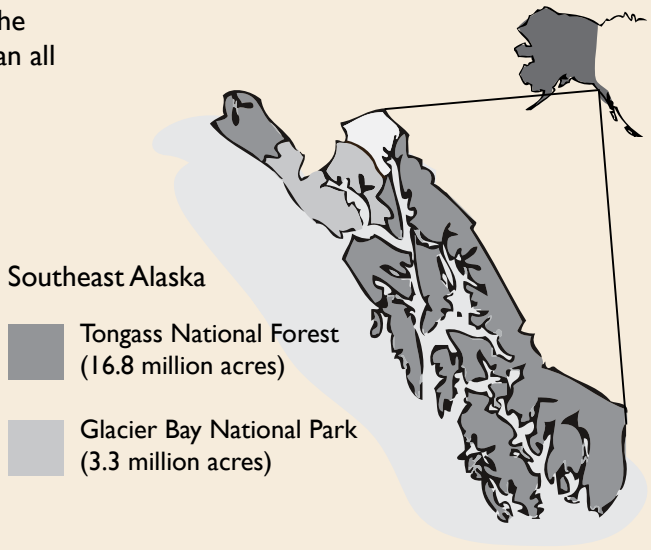
(907) 222-1590

Tongass Salmon Factsheet

These facts are meant to further inform conversations about the Tongass National Forest, which produces more wild salmon than all other national forests combined.



Resource Economics

- Tongass rivers, lakes, and streams produce 80% of the commercial salmon annually harvested from Southeast Alaska. This is about 50 million salmon valued at $60 million annually.
- In 2007, commercial salmon fishing supported an estimated 4,682 jobs (about 1 in 10) in Southeast Alaska, including 2,998 direct fishing jobs and 846 seafood processing jobs.
- In 2007, the combined economic impact of commercial, sport and subsistence salmon fishing, as well as hatchery operations, in SE Alaska, was estimated at $986 million.
- The Tongass NF produces on average 28% of Alaska's annual commercial salmon catch, and 25% of the entire west coast annual harvest!

Cultural Values

- Wild salmon have fed the people of Southeast Alaska for more than 9,000 years.
- Ninety-six percent of Alaskans surveyed say salmon are essential to the Alaskan way of life.

Household Use of Salmon

- Nearly 90% of rural households in Southeast Alaska use salmon.
- The estimated subsistence and personal use harvest averaged 52,511 salmon annually between 2004-2013.
- On average, a resident of Southeast Alaska's rural communities uses 75 pounds of salmon per year (while the US national average for seafood consumption is now less than 15 pounds per person per year).

Sport Fishing

- Two out of every three fish in Southeast Alaska sport harvest are salmon.
- On average, 120,000 sport anglers catch close to one million salmon in Southeast Alaska each year.

Salmon in the Forest

- Tongass fisheries biologists have recorded 14,873 miles of anadromous rivers and streams and 123,173 acres of lakes and ponds that support and produce wild salmon from the Forest.
- Salmon-derived nitrogen has been found in trees more than 500 yards away from salmon streams, particularly in areas where bears feed on salmon.
- More than 50 species of animals feed on salmon when they return to spawn in freshwater.

Watershed Health

- About 6% of the streamside area on Tongass salmon streams has been affected by timber harvest and/or road building.
- Most Tongass watersheds are in near natural conditions, but some critical floodplain areas are degraded in important fish-producing watersheds.
- Per a 2015 forest-wide watershed condition assessment, less than 7% of 900+ watersheds need work to restore aquatic habitat.
- Statewide, 89% of Alaskans say that even in tough economic times, it is important to maintain funding for salmon conservation.

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R10-PR-40
March 2017

Economic Contributions and Impacts of Salmonid Resources in Southeast Alaska

FINAL REPORT

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July 2010

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EXECUTIVE SUMMARY

In southeast Alaska where natural resources are the foundation of many industries and a way of life for residents, salmonids resources make important contributions to commercial, sport, and subsistence/personal use fisheries. Primary salmon species include Chinook, coho, sockeye, chum and pink salmon. Steelhead, Dolly Varden and several trout species (Rainbow, brook and cutthroat) also are important, particularly to sport fisheries.

The strong condition of wild salmonids in Alaska is attributed largely to the relative absence of dams and agricultural and urban development, as well as high marine survival rates, intensive harvest management and the prevalence of intact watersheds. In spite of the degradation of some watersheds in southeast Alaska, the region still supports a disproportionately high share of the wild anadromous stocks of salmonids remaining in the Pacific Northwest. Limiting further habitat degradation will be a key factor in conserving both salmonids and their economic contributions to southeast Alaska.

Although previous studies have examined the economics of southeast Alaska fisheries individually, this study focuses on estimating the combined economic values and impacts of commercial, recreational, and personal use/subsistence salmonid fisheries in southeast Alaska. The 2007 fishing season is used to develop a "snapshot" of these values and impacts. Catch data compiled by the Alaska Department of Fish & Game are used with economic factors, including prices paid for the commercial salmon harvest and expenditures made by recreational anglers, to develop economic values. An input-output model for the southeast Alaska economy was developed and used to estimate the regional economic impacts of the salmonid fisheries.

Some highlights of the economic contributions that salmonid fisheries in southeast Alaska make include:

CONTRIBUTIONS TO COMMERCIAL FISHERIES

Between 2003 and 2007, the commercial salmon harvest in southeast Alaska annually ranged between 30 million and 70 million fish. Pink salmon accounted for about 74 percent of all salmon commercially caught in southeast Alaska, followed by chum (18% of all salmon), sockeye (4% of all salmon), coho (2% of all salmon), and Chinook (0.7% of all salmon). Across all salmon species, salmon commercially harvested in southeast Alaska comprised about 28 percent of all commercially caught salmon statewide.

In terms of landing value (also known as ex-vessel value), commercially-caught salmon in southeast Alaska ranged in value between 2003 and 2007 from $63.7 million to $113.4 million. The wholesale value of salmon commercially-harvested in southeast Alaska in 2007 is estimated at $260.9 million, including $34.1 million in net economic values (profits to harvesters and processors).

Fishing vessels, processors, and industry-support businesses generate economic activity throughout the southeast Alaska region. The commercial harvest of salmon generated an estimated $288.5 million in direct expenditures in 2007, and supported an estimated 4,682 full- and part-time jobs, including 2,998 jobs in commercial fishing and 846 jobs in processing, and generated an estimated $94.3 million in personal income, including $27.8 million for commercial harvesters and $32.3 million for processors. The value of total (direct, indirect, and induced) output generated by commercial fishing and processing of salmon is estimated at $599.3 million in 2007.

CONTRIBUTION TO SPORT FISHERIES

Sport fishing in Alaska attracts large numbers of both resident and non-resident anglers. Statewide, anglers participated in 2.5 million days of fishing in 2007, with about 1.5 million days occurring in freshwaters and 1.0 million days occurring in marine waters. Similar to other areas of Alaska, sport fishing opportunities in southeast Alaska are abundant. In most management areas of the region, anglers can fish for all five salmon species, as well as for Dolly Varden, brook trout, rainbow/steelhead trout, cutthroat trout, grayling, halibut and lingcod. Most angling in southeast Alaska occurs in marine waters, and nonresidents of Alaska account for a larger share of the sport fishing activity.

Between 2003 and 2007, the annual sport catch of salmon in southeast Alaska ranged from 748,480 fish to 1.26 million fish. Coho accounted for about 41 percent and pink salmon accounted for about 31 percent of all salmon caught in southeast Alaska sport fisheries. Across all salmon species, the sport harvest of salmon in southeast Alaska in 2007 comprised about 28 percent of all recreationally-caught salmon statewide.

In terms of angler expenditures, recreational fishing for salmonids in southeast Alaska generated an estimated $174 million in angler expenditures in 2007, including trip-related expenditures, fishing equipment, and fishing-related real estate expenditures. Net economic values (or net willingness to pay) for sport fishing in southeast Alaska during 2007 were an estimated $8.2 million for resident anglers and $21.8 million for nonresident anglers.

Similar to commercial fisheries, sport fisheries in southeast Alaska are an important contributor to the regional economy. Purchases of goods and services by resident and nonresident anglers fishing for salmonids support a large number of businesses in southeast Alaska. The value of total output (including direct, indirect, and induced effects) related to purchases by salmonid anglers in southeast Alaska was an estimated $358.7 million in 2007, and supported an estimated 2,334 jobs and generated $84.7 million in personal income.

CONTRIBUTION TO PERSONAL USE AND SUBSISTENCE FISHERIES

Personal use fishing is defined as the taking of, or fishing for fishery resources by Alaska residents for personal use and not for sale or barter, and subsistence fishing is defined as the taking of, or fishing for fishery resources by a resident for subsistence uses. In 2007, 3,153 permits were issued in southeast Alaska (including Yakutat) for personal use and subsistence fishing, with a catch of 41,863 salmon (88 percent was sockeye).

Personal use and subsistence fishing trips generated an estimated $453,500 in expenditures in 2007. Net economic values associated with personal use and subsistence fishing in southeast Alaska are estimated at $320,270 for 2007. Based on $453,500 in trip-related spending, economic activity included the support of five jobs and $195,000 in personal income throughout the region.

CONTRIBUTION OF HATCHERY OPERATIONS TO THE REGIONAL ECONOMY

Almost all salmon smolts from hatcheries in southeast Alaska are produced at facilities owned and operated by private nonprofit (PNP) corporations. Local expenditures made by salmon hatcheries in southeast Alaska are estimated at $11.6 million in 2007, including salary costs and the local purchase of goods and services that support hatchery operations. Hatchery operations directly supported an estimated 174 jobs and generated $6.4 million in income to hatchery staff and proprietors. The direct expenditures by hatcheries multiply as they ripple though the regional economy, thereby resulting in a total of 260 jobs and $9.7 million in personal income in the region.

SUMMARY OF ECONOMIC CONTRIBUTIONS

Salmonid resources create value for persons participating in commercial, sport, and personal use/subsistence fisheries (use values) in southeast Alaska, as well as generate economic activity in local and regional economies. The “use values” of salmonid resources to commercial fisheries in southeast Alaska are estimated at $260.9 million in 2007. The value of salmonid resources to recreational fisheries in southeast Alaska is estimated at $204.4 million in 2007, including expenditures of $174.4 million and net economic values of $30.0 million. The value of salmonid resources to personal use/subsistence fisheries is estimated at $0.77 million, including $453,500 in expenditures and $320,300 in net economic values. In sum, these three components of use values total $466.1 million in 2007.

Salmonid fisheries of southeast Alaska and hatchery operations also contribute to economic activity in the region. Total economic output associated with the three fisheries and hatchery operations is estimated at $986.1 million in 2007, which includes multiple rounds of economic activity resulting from the multiplier effect. The total (direct, indirect, and induced) number of jobs supported by southeast Alaska salmonid fisheries and hatchery operations are estimated at 7,282, and total personal income (wage earnings, profits, and other income) generated by these fisheries and hatchery operations is an estimated $188.9 million.

Fishing for salmon in southeast Alaska, including commercial, recreational and personal use/ subsistence and the processing of commercially harvested salmon, accounts for an estimated 10.8 percent of all employment in southeast Alaska. By comparison, logging and forestry support operations generate an estimated 1.7 percent, and mining supports about 1.0 percent of all regional employment. Employment in state and local government accounts for 21.8 percent of the regional jobs, and employment in the Federal government represents 6.6 percent.

INTRODUCTION

Southeast Alaska includes hundreds of large and small watersheds dispersed throughout more than 1,000 islands strung together just offshore the mainland *(Figure 1)*. The area extends about 500 miles from the U.S./Canada border just below Prince of Wales Island north to Yakutat and Cape Suckling. The Tongass National Forest encompasses over 90 percent of the land area of southeast Alaska.

Figure 1. Southeast Alaska Study Area

Understanding the economic values and impacts of the fisheries of southeast Alaska is important for assessing the contributions of watershed programs designed to conserve and enhance natural resources. In southeast Alaska, natural resources are the foundation of many industries and a way of life for residents. Salmonids are important resources that substantially contribute to commercial, sport, and subsistence/personal use fisheries. Primary salmon species include Chinook, coho, sockeye, chum and pink salmon. Steelhead, Dolly Varden/Arctic Char, and several trout species (Rainbow, brook, and cutthroat) also are important, particularly to sport fisheries.

Economic values and impacts are two widely used but distinctly different economic measures. Economic values associated with commercial, recreational, and personal use fisheries measure the monetary importance of these fisheries to those who participate in them. Economic impacts, on the other hand, measure the contribution that the fisheries make to economic activity within a region, as measured in terms of jobs and personal income. Both indicators help to describe the economic importance (or contribution) of fisheries such as salmonid fisheries in southeast Alaska.

Throughout the western United States and British Columbia, Canada, numerous stocks of anadromous salmonids are at risk of extinction, declining, or of serious concern. Of the four salmon producing regions of North America, including Alaska, British Columbia, Pacific Northwest, and Northeast, Alaska is the only region where the condition of wild salmon stocks are considered strong (Knapp 2007). The watersheds of southeast Alaska support a disproportionately high share of the wild anadromous stocks of salmon remaining in the Pacific Northwest (Bryant and Everest 1998). Average commercial catches of wild salmon stocks from Alaska accounted for 89 percent of the estimated 385 million tons of wild salmon stocks harvested in North America over the 1996 though 2001 period.

The relatively strong condition of wild salmon in southeast Alaska is attributed largely to the absence of dams and agricultural and urban development, and to intact watersheds. Intensive human exploitation of watersheds in southeast Alaska began only a few decades ago; however, large scale habitat degradation and fishing pressure pose potential risks to salmonids stocks in southeast Alaska (Bryant and Everest 1998).

Although the economic contribution of southeast Alaska's salmonid resources to commercial and recreational fisheries have been previously studied (Knapp 2007; Northern Economics 2009; ISER 1999; Jones & Stokes Associates 1991), the goal of this study is to conduct a more holistic review of the contribution of salmonid resources to affected fisheries, including subsistence and personal use fisheries. In addition, the role that salmon hatcheries play in supporting salmon fisheries in southeast Alaska and in contributing to the regional economy is examined. Specific objectives of the study are to:

- identify harvest statistics for commercial, sport, and subsistence/personal use salmonid fisheries in southeast Alaska,
- characterize resident and non-resident sport fishing activity by species group,
- estimate gross and net economic values associated with the commercial, sport, and personal use fisheries in southeast Alaska,
- estimate regional economic impacts (purchases, jobs, and earnings) associated with salmonid fisheries in southeast Alaska, and compare to levels of economic activity for other natural resources-based (e.g., timber, mining, oil and gas) and other important industries in southeast Alaska; and
- characterize relevant statistics (e.g., number of facilities, annual operating budgets, jobs) pertaining to salmonid hatchery operations in southeast Alaska.

This report is organized by "user type" of salmonid fishery in southeast Alaska. The contribution that salmon hatcheries make to southeast Alaska fisheries and to the regional economy is presented first, followed by characterizations and economic assessments of commercial, sport, and personal use/subsistence salmonid fisheries. Most statistics presented pertain to these fisheries in 2007; harvest and catch data between 2003 and 2007 also are presented for additional context. Lastly, the economic importance of salmonid resources to fishery participants and the regional economy as a whole is presented.

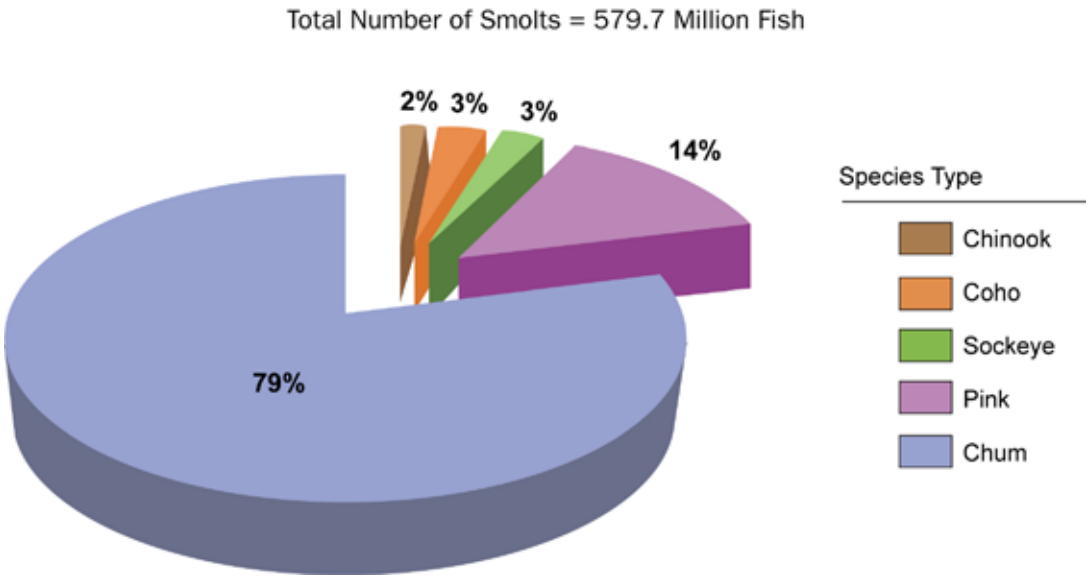
HATCHERY OPERATIONS

In response to declining wild-stock runs of salmon during the late 1960's and early 1970's, the Fisheries Rehabilitation, Enhancement and Development Division of the Alaska Department of Fish and Game (ADF&G) embarked on a significant program in the mid-1970s focused on constructing salmon hatcheries to enhance harvest opportunities in both commercial and recreational salmon fisheries. By the late 1990's and early 2000's, statewide hatchery production annually ranged from between 27 and 63 million adult fish.

The ADF&G oversees and regulates all state and private sector salmon enhancement and rehabilitation projects in Alaska. Salmon hatcheries are located in two primary regions of Alaska: the Cook Inlet and Prince William Sound area, and southeast Alaska. As shown in *Figure 1*, salmon hatcheries in southeast Alaska are dispersed throughout the region. In 2007, releases of salmon smolts produced at salmon hatcheries in southeast Alaska was about 580 million fish, representing 37 percent of the statewide totals. Chum salmon account for nearly 80 percent of all salmon released from hatcheries in southeast Alaska in 2007 *(Figure 2)*.

Almost all salmon at hatcheries in southeast Alaska are produced at facilities owned and operated by private nonprofit (PNP) corporations. The Alaska State Legislature authorized in 1974 the establishment of private nonprofit hatcheries in Alaska. The legislature also authorized the formation of regional associations comprised of representatives from local communities to develop and maintain regional salmon production through rehabilitation and enhancement,

Figure 2.
Releases of Salmon Smolts from Southeast Alaska Hatcheries (Year 2007)

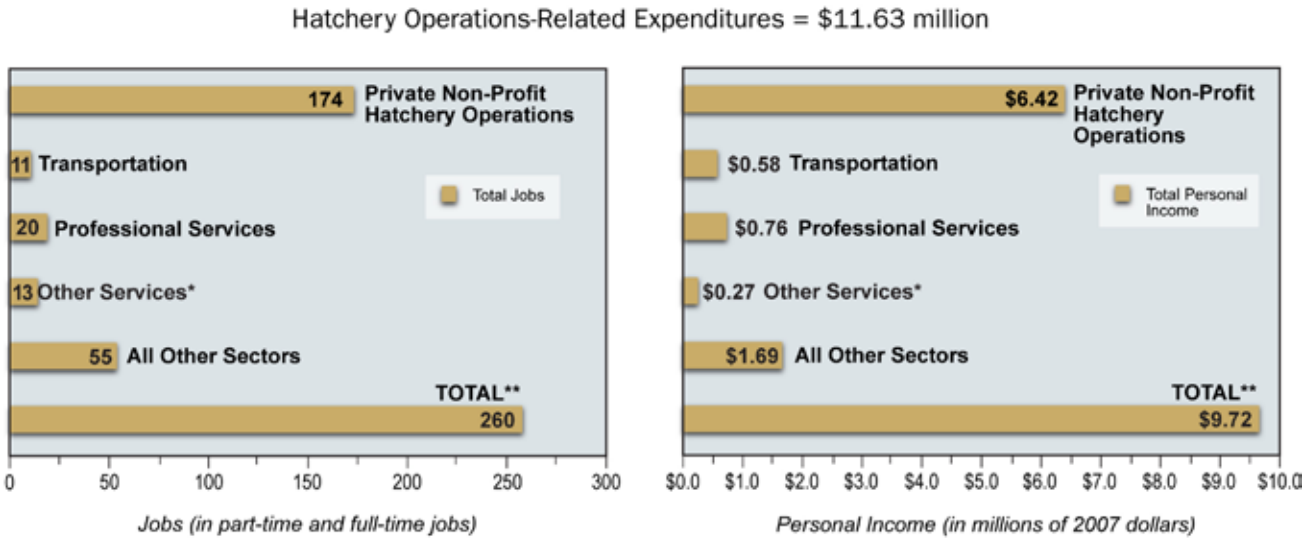


including operation of the PNP hatcheries. These regional associations collect a 3-percent salmon enhancement tax on some commercial landings for enhancement operations, and receive cost-recovery income through the harvest and sale of a portion of the hatchery returns. (McDowell Group 2000)

In addition to hatchery-bred salmon produced primarily for commercial harvest, several hundred thousand smolts and a small number of catchable sized salmon are produced at hatcheries in southeast Alaska for sport enhancement projects. Small numbers of rainbow trout eggs and grayling fry also are supplied to southeast Alaska stocking projects. Typically, rainbow trout eggs are incubated at the Fort Richardson hatchery near Anchorage and then are sent to the Deer Mountain hatchery in southeast Alaska for rearing and stocking. Grayling eggs are taken from the Chena River in Fairbanks, incubated and reared in Anchorage and then flown to southeast Alaska for stocking. (Milton, personal communication)

Hatchery operations in southeast Alaska generate economic impacts within the region based on hatchery expenditures on labor and on the local procurement of goods and services needed for operations. Local expenditures made by salmon hatcheries in southeast Alaska are estimated at $11.6 million in 2007, including the costs for salaries and the local purchase of goods and services that support hatchery operations. Fish food is a major cost for salmon hatcheries, but most fish food is purchased from out-of-state vendors (Pryor, personal communication). In terms of impacts on the regional economy, hatchery operations directly support an estimated 174 jobs and generate $6.4 million in income to hatchery staff and proprietors *(Figure 3)*. Direct expenditures ($11.6 million) by hatcheries multiply as they ripple though the regional economy, resulting in a total of 260 jobs and $9.7 million in personal income throughout the region.

Figure 3.
Economic Impacts of Salmon Hatchery Operations in Southeast Alaska on Sectors of the Southeast Alaska Regional Economy (Year 2007)



** Other services include machinery and equipment repair and maintenance, and other lesser-important services.*

*** Total jobs and personal income include "induced" effects resulting from spending of income received by households and revenues received by local governments.*

Source: Results from IMPLAN-based economic impact model developed by Ed Waters; refer to Appendix A for modeling details.

COMMERCIAL FISHERIES

Industry and Activity Overview

Commercial harvesting of salmon resources in southeast Alaska began in the late 1870's. All five Pacific salmon species (Chinook, coho, sockeye, pink and chum) are annually harvested in the waters off of southeast Alaska. Sockeye salmon was the primary species harvested until the early 1900's when pink salmon began to dominate (ADF&G 2008). Between 2000 and 2008, pink salmon accounted for 73 percent of the salmon harvest (numbers of fish) in southeast Alaska. (ADF&G undated)

The State of Alaska took over management control of salmon resources in Alaska from the federal government soon after statehood in 1959 (Northern Economics 2010). For management purposes, southeast Alaska is divided into six management areas: Juneau, Ketchikan/Craig, Petersburg/ Wrangell, Sitka, Haines, and Yakutat. These management areas closely correspond with the management areas for sport fishing in southeast Alaska *(Figure 1)*. Prior to each salmon season, ADF&G develops detailed management plans that specify how salmon fisheries will be managed for that year. Specific management actions that specify times and areas of fishery openings are identified; additional measures are also implemented during the season through emergency orders.

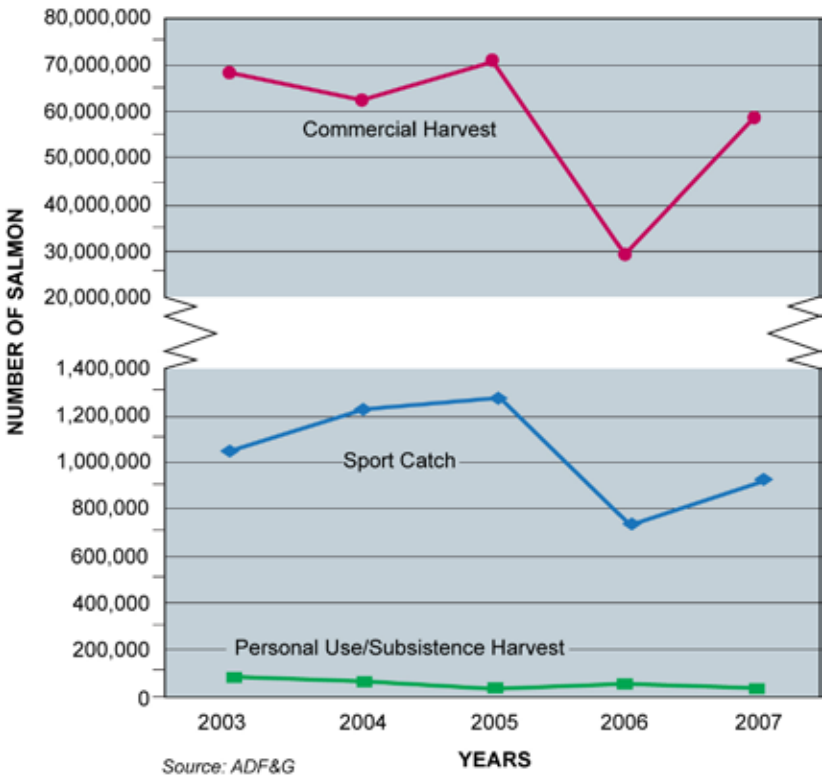
Salmon are commercially harvested in southeast Alaska using purse seines, drift nets, and hand and power troll gear; set gillnets are used instead of purse seines and drift gillnets in the Yakutat region of southeast Alaska. Drift and set gillnets are confined to state waters (generally within 3 miles), whereas troll fisheries operate in both state waters and in the federal waters of the Exclusive Economic Zone. (ADF&G 2008)

Because of the mixed stock and mixed species nature of salmon returns, and because different gear groups often harvest the same stocks of fish, the management of commercial salmon fisheries in southeast Alaska is complex. The Southeast region contains an estimated 5,500 salmon producing streams and tributaries of various productivity levels, making stock-specific fisheries management according to run strength impractical for most individual returns. Additionally, some salmon harvested in the region originate from other states (primarily Washington and Oregon) and from Canada. Net and troll fisheries in southeast Alaska are managed for sustained yield, allocated among users according to Alaska Board of Fisheries regulations, and in accordance with harvest sharing provisions of the Pacific Salmon Treaty between the U.S. and Canada. (ADF&G 2008)

Fish Harvesting and Ex-Vessel Values

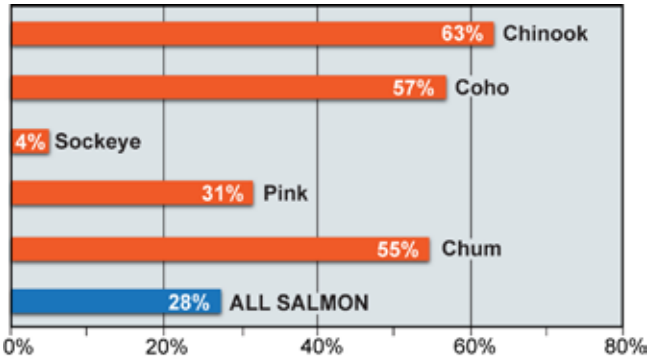
Along with groundfish, herring, and shellfish, salmon is one of the most important commercial fisheries in southeast Alaska. As *Figure 4* shows, the annual salmon harvest ranged between 30 and 70 million fish between 2003 and 2007. In terms of species, pink salmon accounted for about 74 percent of all salmon commercially caught in southeast Alaska between 2003 and 2007, followed by chum (18.1% of all salmon), sockeye (4.4% of all salmon), coho (2.9% of all salmon), and Chinook (0.7% of all salmon).

Figure 4.
Commercial Harvest, Sport Catch and Personal Use/Subsistence Harvest of Salmon in Southeast Alaska, 2003-2007



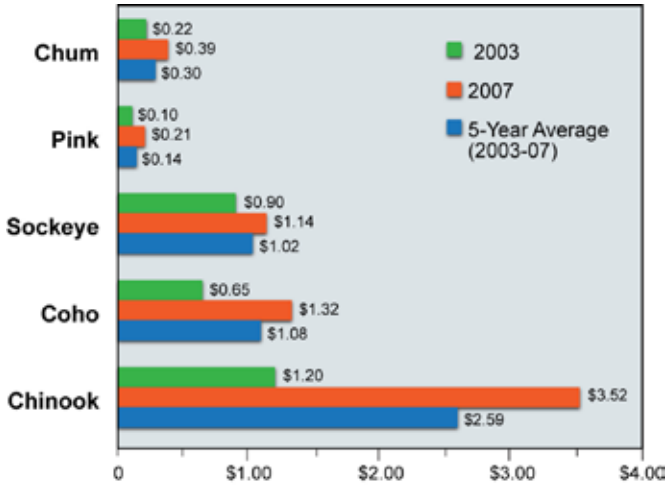
As a percent of the statewide harvest, Chinook, coho and chum commercially harvested in southeast Alaska each accounted for more than 50 percent of the statewide totals *(Figure 5)*. The harvest of pink salmon in southeast Alaska accounted for about 31 percent of all pink salmon commercially caught in Alaska between 2003 and 2007, and the commercial harvest of sockeye in southeast

Figure 5.
2007 Commercial Harvest of Salmon in Southeast Alaska as a Percent of Statewide Total



Source: ADF&G

Figure 6.
Average Price Paid (Exvessel Value) for Salmon Harvested in Southeast Alaska (Years 2003 - 2007)



Source: ADF&G

Alaska accounted for only about 4 percent of the statewide total. Across all salmon species, salmon commercially harvested in southeast Alaska comprised about 28 percent of all commercially caught salmon statewide.

In terms of landing value (also known as ex-vessel value), commercially-caught salmon in southeast Alaska ranged in value from $63.7 million in 2003 to $113.4 million in 2007. This compares to 2007 exvessel values of $6.9 million for groundfish (state-managed waters only) and $21.5 million for shellfish. (ADF&G undated)

The average price paid "at the dock" for salmon varies considerably over the five types of salmon species. In 2007, the average price paid for Chinook salmon landed at ports in southeast Alaska was $3.52 per pound, followed by coho salmon at $1.32 per pound, sockeye salmon at $1.14 per pound, chum salmon at $0.39 per pound, and pink salmon at $0.21 per pound. These average prices represent a significant increase over prices paid earlier in the decade. In 2003, average prices in southeast Alaska were $1.20 per pound for Chinook, $0.65 for coho, $0.90 for sockeye, $0.22 for chum, and $0.10 for pink salmon *(Figure 6)*.

Because of the variation in average price across species, the total landing value associated with the different salmon species is more evenly distributed than the number of fish harvested, with the average annual value between 2003 and 2007 as follows: Chinook, $15.8 million; coho, $17.6 million; sockeye, $10.1 million; pink, $20.4 million; and chum, $25.9 million. Based on average margins by product (canned, fresh, and frozen) for Alaska salmon processors between 2000 and 2004, the wholesale value of salmon commercially-harvested in southeast Alaska in 2007 is estimated at $260.9 million. (This value likely underestimates the actual value because of the increase in salmon prices since the 2000 to 2004 period.)

As explained more thoroughly by Knapp (2007), prices for salmon products at the retail level vary considerably, making determination of the value of salmon products to consumers very difficult. For all species of salmon, prices paid by the consumer "can and do change from year to year, from season to season, and even from day to day." Salmon prices paid by consumers can range from $2.99 per pound in supermarkets, to the equivalent of $30 or more a pound at restaurants. For these and other reasons, the value of salmon commercially harvested from southeast Alaska waters is estimated at the processing (or wholesale) level. It should be recognized, however, that additional value is added as salmon products move up distribution channels.

Net Economic Values

Net economic value is a gauge of the amount of wealth generated for participants in the commercial fisheries. For this study, net economic value for the commercial fishery is defined as the gross revenues generated by commercial harvesting and processing *minus* the costs to harvest and process seafood. In other words, net economic value represents the profits to commercial harvesters and processors.

As discussed previously, the commercial harvest of salmon from southeast Alaska waters generated about $113.4 million in ex-vessel value for harvesters in 2007 and $260.9 million in wholesale value after processing. The net economic value (or profit) associated with the harvesting and processing of the 2007 commercial harvest from southeast Alaska waters is estimated at $34.1 million, based on net income factors estimated by The Research Group (2009) and applied to the 2007 harvest of the different salmon species.

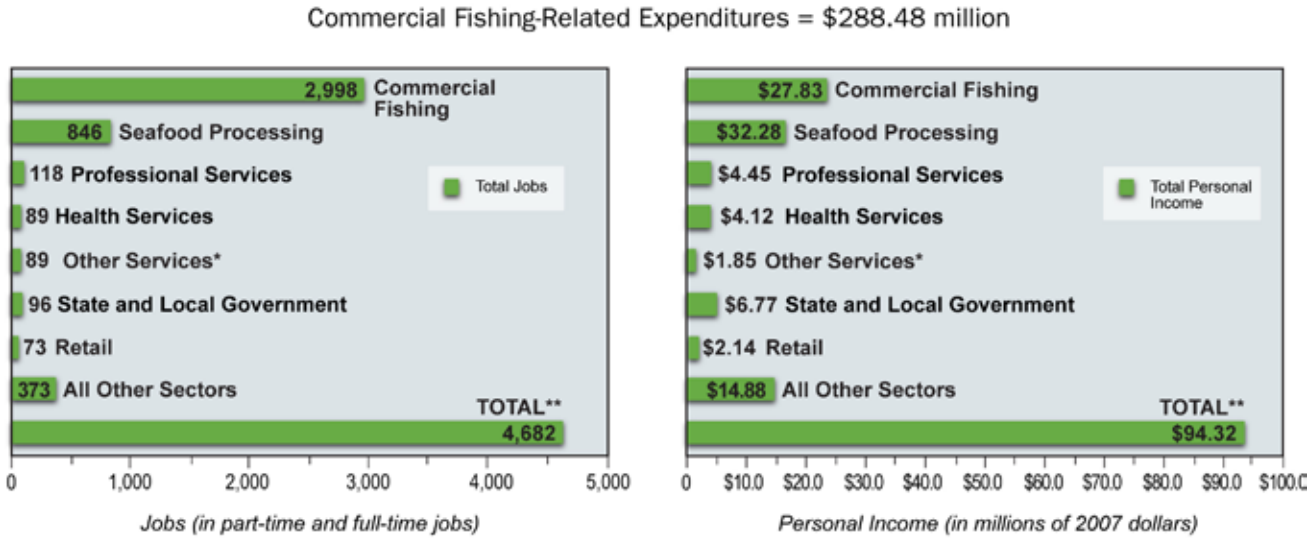
Economic Impacts

Fishing vessels, processors, and industry-support businesses generate economic activity throughout the southeast Alaska region. The economic impacts of the commercial salmon fishery in southeast Alaska can be characterized in terms of the economic output (total expenditures) of the commercial harvesting and processing sectors, and by the employment and personal income directly and indirectly generated by those activities. As described in Appendix A, an economic impact model based on the IMPLAN input-output modeling platform and database was constructed to assess economic impacts of the 2007 commercial harvest in southeast Alaska.

The estimated economic impacts, including output, jobs and personal income, generated by the harvesting and processing of seafood from southeast Alaska waters in 2007 are shown in *Figure 7*. The commercial harvest of salmon generated $288.5 million in direct expenditures in 2007 that supported an estimated 4,682 full- and part-time jobs, including 2,998 jobs in commercial fishing and 846 jobs in seafood processing. Personal income in southeast Alaska generated by the commercial harvesting of salmon was an estimated $94.3 million, including $27.8 million for

commercial harvesters and $32.3 million for processors. The value of total (direct, indirect, and induced) output generated by commercial fishing and processing of salmon was an estimated $599.3 million in 2007.

Figure 7.
Economic Impacts of Commercial Fisheries in Southeast Alaska on Sectors of the Southeast Alaska Regional Economy (Year 2007)



** Other services include machinery and equipment repair and maintenance, and other lesser-important services.*

*** Total jobs and personal income include "induced" effects resulting from spending of income received by households and revenues received by local governments.*

Source: Results from IMPLAN-based economic impact model developed by Ed Waters; refer to Appendix A for modeling details.

SPORT FISHERIES

Activity Overview

Sport fishing opportunities for salmon in Alaska are world-renowned, and attract large numbers of both resident and nonresident anglers. According to the U.S. Fish and Wildlife Service (U.S. Department of the Interior 2008), 180,000 anglers participated in sport fishing throughout Alaska in 2006, of which state residents accounted for 76,000 (42%) and nonresidents of Alaska accounted for 104,000 (58%).

Similar to other areas of Alaska, sport fishing opportunities in southeast Alaska are abundant. In most management areas of the region, anglers can fish for all five salmon species, as well as for Dolly Varden, brook trout, rainbow/steelhead trout, cutthroat trout, grayling, halibut and lingcod. Unlike fishing opportunities in the more populated areas of Southcentral Alaska, most angling in southeast Alaska occurs in marine waters, and nonresidents of Alaska account for a larger share of the sport fishing activity. Overall, most sport fishing in southeast Alaska occurs without guide services, although nonresidents (51%) are much more likely than residents (8%) to take guided

fishing trips (Southwick Associates 2009). Both resident and nonresident anglers in southeast Alaska are more likely to fish in marine waters than in freshwaters.

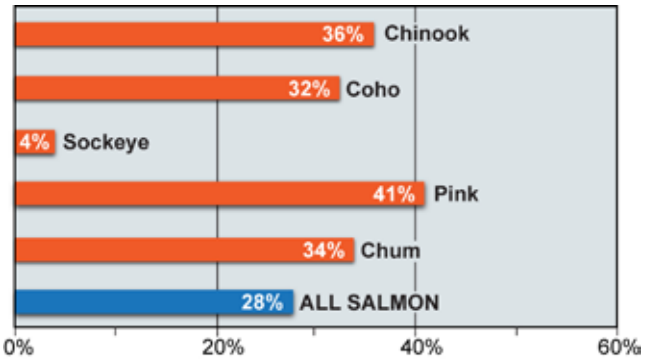
ADF&G regulates marine and freshwater sport fishing in southeast Alaska on a region-wide basis. Although regulations are developed region-wide, specific exceptions to these regulations are developed on a management area-by-management area basis. There are seven sport fishing management areas in southeast Alaska: Ketchikan, Prince of Wales Island, Petersburg-Wrangell, Sitka, Juneau-Glacier Bay, Haines-Skagway, and Yakutat *(Figure 1)*. In addition to the region-wide marine and freshwater regulations, ADF&G has specific regulations for trout in southeast Alaska, which are based on ADF&G research on cutthroat trout and steelhead. (ADF&G 2010)

Catch, Effort and Expenditures

Between 2003 and 2007, the annual sport catch of salmon in southeast Alaska ranged from 748,480 fish (in 2006) to 1.26 million fish (in 2005) (Figure 4). In terms of numbers of salmon caught, coho accounted for about 41 percent of all salmon caught in southeast Alaska sport fisheries between 2003 and 2007, followed by pink salmon (31% of all salmon caught), Chinook (18%), chum (6%), and sockeye (4%).

As a percent of the statewide catch, pink salmon caught in southeast Alaska sport fisheries is the only salmon species that accounted for more than 40 percent of the statewide totals in 2007 *(Figure 8)*. The harvest of Chinook, coho, and chum salmon in southeast Alaska each accounted for between 25 percent and 35 percent of the statewide totals for these species, and the harvest of sockeye accounted for about 4 percent of the statewide totals in 2007. Across all salmon species, the sport harvest of salmon in southeast Alaska in 2007 comprised about 28 percent of all recreationally-caught salmon statewide.

Figure 8.
2007 Sport Catch of Salmon in Southeast Alaska as a Percent of Statewide Total



Source: ADF&G

In 2007, salmon accounted for 929,751 fish (57.4%) of the total number of fish caught (1,619,272 fish) in all sport fisheries in southeast Alaska (ADF&G undated). Catch of Dolly Varden/ Arctic Char was 53,656 fish (3.3% of all fish caught), trout (including rainbow, Cutthroat, brook, and Lake) was 28,967 fish (1.8%), and steelhead was 14,853 fish (0.9%).

In southeast Alaska, recreational anglers participated in 540,260 days of fishing in 2007 (about 22% of statewide totals). Of this total, 81 percent (435,340 days) were in marine waters and 19 percent (104,920 days) were in freshwaters. Residents of Alaska accounted for 219,130 days, or about 41 percent of all angler days, and nonresidents of Alaska accounted for 321,150, or 59 percent. (Southwick Associates 2008)

In terms of angler expenditures, recreational anglers fishing in southeast Alaska spent an estimated $274 million in 2007 on equipment, boats, and trip-related and other items (including construction and maintenance of real estate primarily used for sport fishing), representing about 20 percent of statewide spending on recreational fishing in 2007. Saltwater fishing accounted for almost half ($132 million) of all angler spending in southeast Alaska. Resident anglers accounted for 36 percent of all Southeast sport fishing-related spending and non-residents accounted for 64 percent. Based on the catch of salmonids (including steelhead, trout, and Dolly Varden) as a percentage of the total sport catch in southeast Alaska (63.4%), it is estimated that recreational fishing for salmonids in southeast Alaska accounted for about $174 million of the $274 million in angler expenditures in 2007.

Net Economic Values

A widely-accepted notion is that anglers fishing for salmon, steelhead and other salmonids typically receive some value associated with their fishing experience that is over and above the out-of-pocket expenditures that anglers make to participate in these activities. This "surplus value" concept, which is often referred to as net willingness to pay, is important for understanding the total economic value of sport fisheries and for assessing the economic feasibility of investments to improve the quality of the fishing experience. In essence, these "net economic values" measure the benefits to sport anglers (over and above the costs) of fishing opportunities

Net economic values of sport fishing activities typically are determined based on the value associated with an angler day (or trip). Angler surveys often are used to estimate these values, which can differ by type of activity, including species sought, mode of fishing (e.g., shore fishing or fishing from a boat), and angler success.

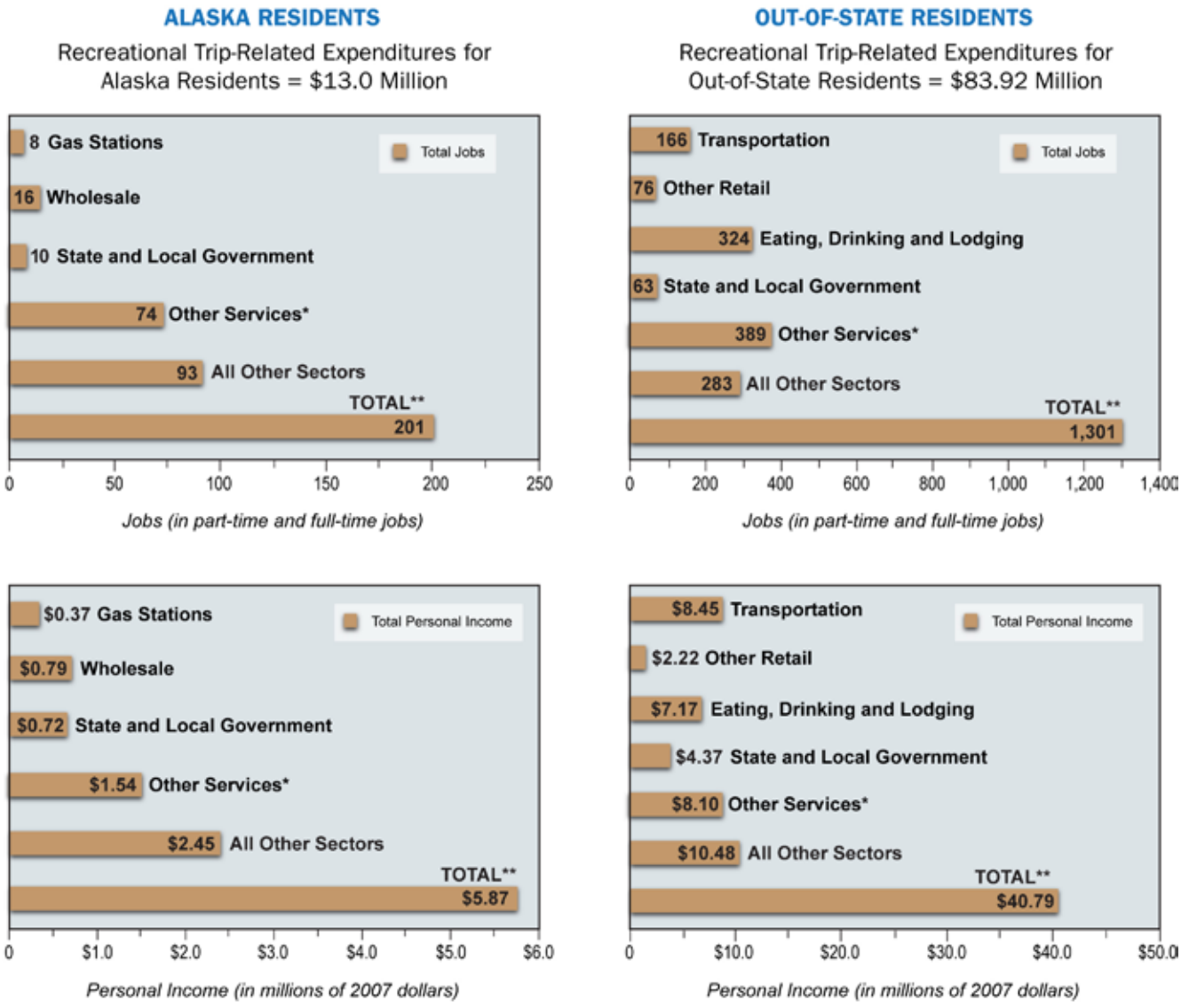
For this study, net economic values for sport fishing for salmonids are estimated based on values derived from a 1999 study of sport fishing in Alaska (ISER 1999). Net economic values (on a angler-day basis) derived from the ISER study are $26.45 per angler day for resident anglers and $47.79 per angler day for nonresident anglers; values were adjusted to 2007 dollars using the consumer price index (1.4194 times 1993 values). These adjusted angler day values were then multiplied by the number of angler days for 2007 reported above–219,130 angler days for resident anglers and 321,150 angler days for nonresidents. These calculations result in estimates of net economic values for sport fishing in southeast Alaska during 2007 of $8,226,100 for resident anglers, and of $21,783,600 for nonresident anglers.

It should be noted that these estimates of net economic value are approximations that are based on average per angler-day values. More precise estimates could be developed by considering important site and species characteristics, such as catch rates and other indicators of sport fishing quality. Collecting and analyzing these types of data, however, are beyond the scope of this study, which necessitates using readily available information instead.

Economic Impacts

Similar to commercial fisheries, sport fisheries in southeast Alaska are an important contributor to the regional economy. Resident and nonresident anglers make purchases of many goods and services that in turn support, both directly and indirectly, a large number of businesses in southeast Alaska. These purchases include trip-related items such as food and lodging, fish packages that include travel arrangements as well as food, lodging, and guiding services, and fishing equipment

Figure 9.
Economic Impacts of Sport Fisheries in Southeast Alaska on Sectors of the Southeast Alaska Regional Economy (Year 2007): Trip-Related and Package Expenditures



** Other services include amusement and recreation services, automobile repair and maintenance, household goods repair and maintenance, and other lesser-important services.*

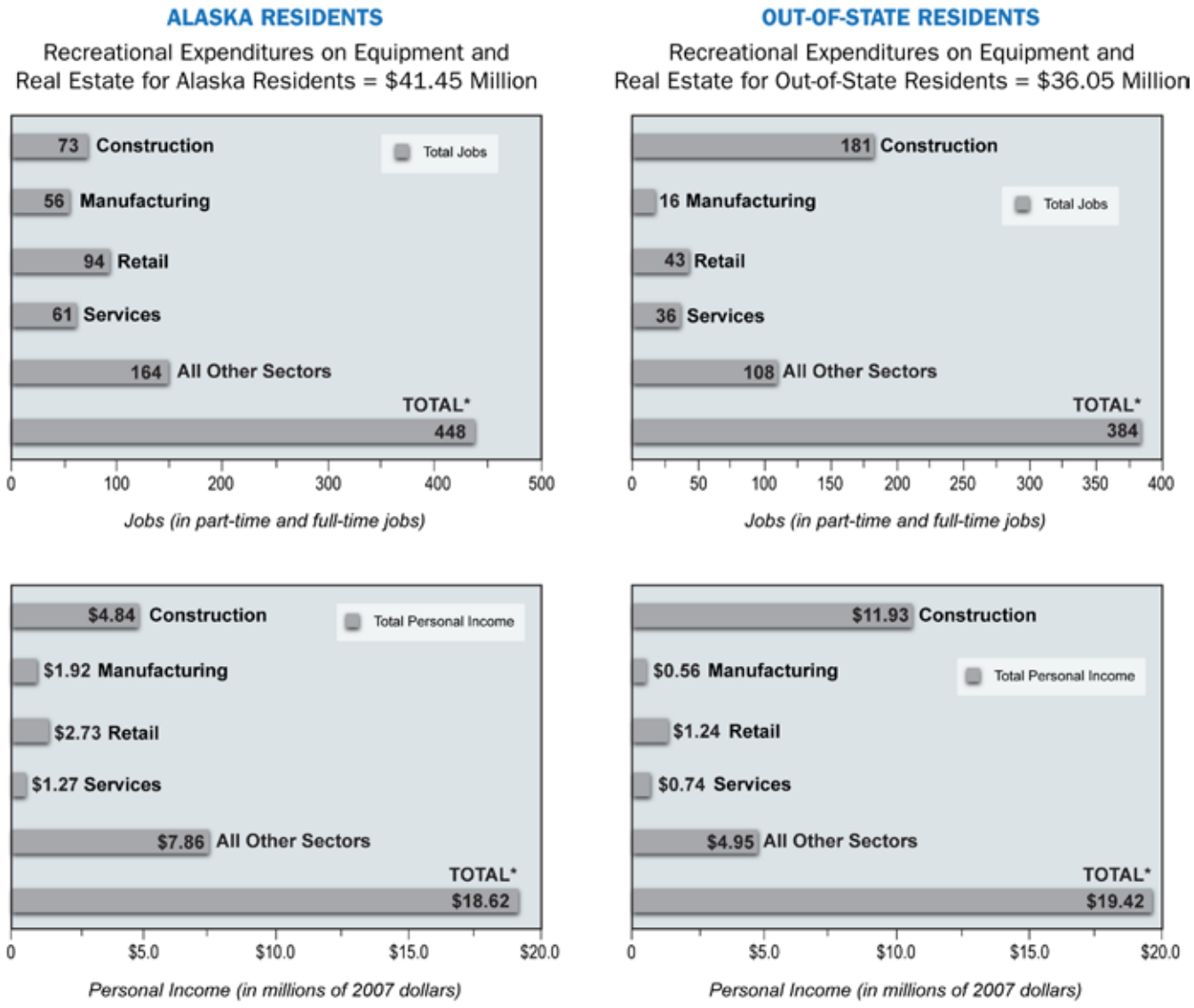
*** Total jobs and personal income include "induced" effects resulting from spending of income received by households and revenues received by local governments.*

Source: Results from IMPLAN-based economic impact model developed by Ed Waters; refer to Appendix A for modeling details.

(including boats). Some resident and nonresident anglers also make fishing-related expenditures for the leasing or owning of real estate that is used for sport fishing purposes.

The expenditures made by anglers for sport fishing activities generate additional economic effects throughout the regional economy beyond the initial angler spending. These additional economic effects are typically estimated with regional input-output models that relate changes in some specific industry to impacts on other industries in the regional economy. For this study, an economic impact model based on the IMPLAN input-output modeling platform and database

Figure 10.
Economic Impacts of Sport Fisheries in Southeast Alaska on Sectors of the Southeast Alaska Regional Economy (Year 2007): Equipment and Real Estate Expenditures



** Total jobs and personal income include "induced" effects resulting from spending of income received by households and revenues received by local governments.*

Source: Results from IMPLAN-based economic impact model developed by Ed Waters; refer to Appendix A for modeling details.

was constructed (see Appendix A) to assess the economic impacts of expenditures made by resident and nonresident anglers for sport fishing for salmonids in southeast Alaska.

Resident anglers who fished for salmonids in southeast Alaska made an estimated $13.0 million in trip-related expenditures, including the purchase of fishing-related packages, in 2007 *(Figure 9)*. These purchases by residents of southeast Alaska supported an estimated 201 jobs and generated $5.9 million in personal income. The value of total output (including multiplier effects) related to purchases by salmonids resident anglers in southeast Alaska was an estimated $26.8 million in 2007.

Although the estimates of economic impacts (jobs and personal income) generated by resident and nonresident anglers are conceptually consistent, these two components of economic impacts are fundamentally different in terms of their contribution to the regional economy. Tourism spending by nonresident anglers is considered a basic industry (much like exporting industries) because money flows into the regional economy from nonresidents of the region, whereas the spending by residents of southeast Alaska is generally considered a reallocation of regional income from one sector to another.

As *Figure 9* shows, the impacts on the regional economy generated by nonresident anglers are substantially higher than those generated by resident anglers. Nonresident anglers spent an estimated $83.9 million on trip-related and package expenditures that supported an estimated 1,301 jobs and generated $40.8 million in personal income. The value of total output generated by nonresident angler purchases was $176.4 million.

The impacts on the regional economy of spending on equipment (including the purchase and maintenance of boats) and real estate-related purchases by resident and non-resident salmonid anglers are shown in *Figure 10*[1]. Unlike for trip-related purchases, resident anglers make greater expenditures on equipment and real estate-related purchases than nonresident anglers do. In 2007, resident anglers spent an estimated $41.4 million on equipment and real estate-related purchases, as compared to an estimated $36.1 million for nonresident anglers.

PERSONAL USE AND SUBSISTENCE FISHERIES

Personal use fishing is defined as the taking of, or fishing for fishery resources by Alaska residents for personal use and not for sale or barter, whereas subsistence fishing is defined as the taking of, or fishing for fishery resources by a resident for subsistence uses (ADF&G undated). In southeast Alaska, a permit is required to participate in personal use fishing.

[1] Expenditures by sport anglers on real estate-related repairs and construction are included in this study because these expenditures were included in the Southwick Associates study that is the source of recreational fishing expenditure data. It should be acknowledged, however, that accurately estimating legitimate real estate-related expenditures associated with recreational fishing is very difficult; as a result, the economic impacts identified in this study that are based on these expenditures should be interpreted cautiously.

As a practical matter, the main difference between personal use fishing and subsistence fishing in southeast Alaska is where anglers fish (Harris, personal communication). Personal use fishing in southeast Alaska occurs in areas designated as "nonsubsistence areas". The Joint Board of Fisheries and Game has designated two nonsubsistence areas in southeast Alaska – the Ketchikan Nonsubsistence Area and the Juneau Nonsubsistence Area.

Personal use fishing in southeast Alaska is managed by the Commercial Fish Division of the ADF&G. Subsistence fishing in state waters also is managed by the Commercial Fish Division, whereas subsistence fishing on Alaska's federal lands and non-navigable waters has been managed since 1990 by the Federal government.

The main reason that Alaska residents participate in personal use and subsistence fishing is the underlying economics. Depending on where the fishing occurs, bag limits are anywhere from 5 to 50 sockeye per day, with annual limits either set at the daily limit or some multiple of it. The gear used is typically dip nets, beach seines, cast nets, and gaffs. Often a group of permit holders will work together and share the harvest. (Harris, personal communication)

Similar to recreational fisheries, the value of personal use or subsistence fishing can be estimated in terms of the expenditures made by participants in the fishery, and by the surplus value or net willingness to pay associated with fishing opportunities. As *Figure 4* shows, the harvest of salmon in personal use and subsistence fisheries in southeast Alaska annually ranged from about 42,000 fish to 79,000 fish between 2003 and 2007. In 2007, 3,153 permits were issued in southeast Alaska (including Yakutat) for personal use and subsistence fishing, with a catch of 41,863 salmon (88 percent was sockeye). Permits were issued to households with an average of three persons per household. Assuming that persons participating in personal use and subsistence fisheries caught, on average, 10 fish on each trip and have per-trip expenditures for bait, fuel, food, and lodging similar to sport anglers, it is estimated that these trips generated $453,500 in expenditures.

A study of personal use and subsistence fisheries in the Copper River of Alaska (Henderson et. al 1999) estimates that residents participating in personal use and subsistence fishing received between $50.93 and $56.88 (1990 values) in net economic value per trip. Using the mid-point of this range and adjusting to 2007 dollars using the consumer price index, per-trip values for 2007 are estimated at $76.51. Using this average per-trip value and the estimated 4,186 trips, net economic values for personal use and subsistence fishing in southeast Alaska are estimated at $320,270 for 2007.

The trip-related spending by persons participating in personal use and subsistence fisheries also generates economic impacts on the regional economy. Based on estimates of $453,500 in trip-related spending in southeast Alaska, this level of spending directly and indirectly supports five jobs and generates $195,000 in personal income throughout the region.

ECONOMIC CONTRIBUTIONS AND IMPACTS OF SOUTHEAST ALASKA SALMONID RESOURCES

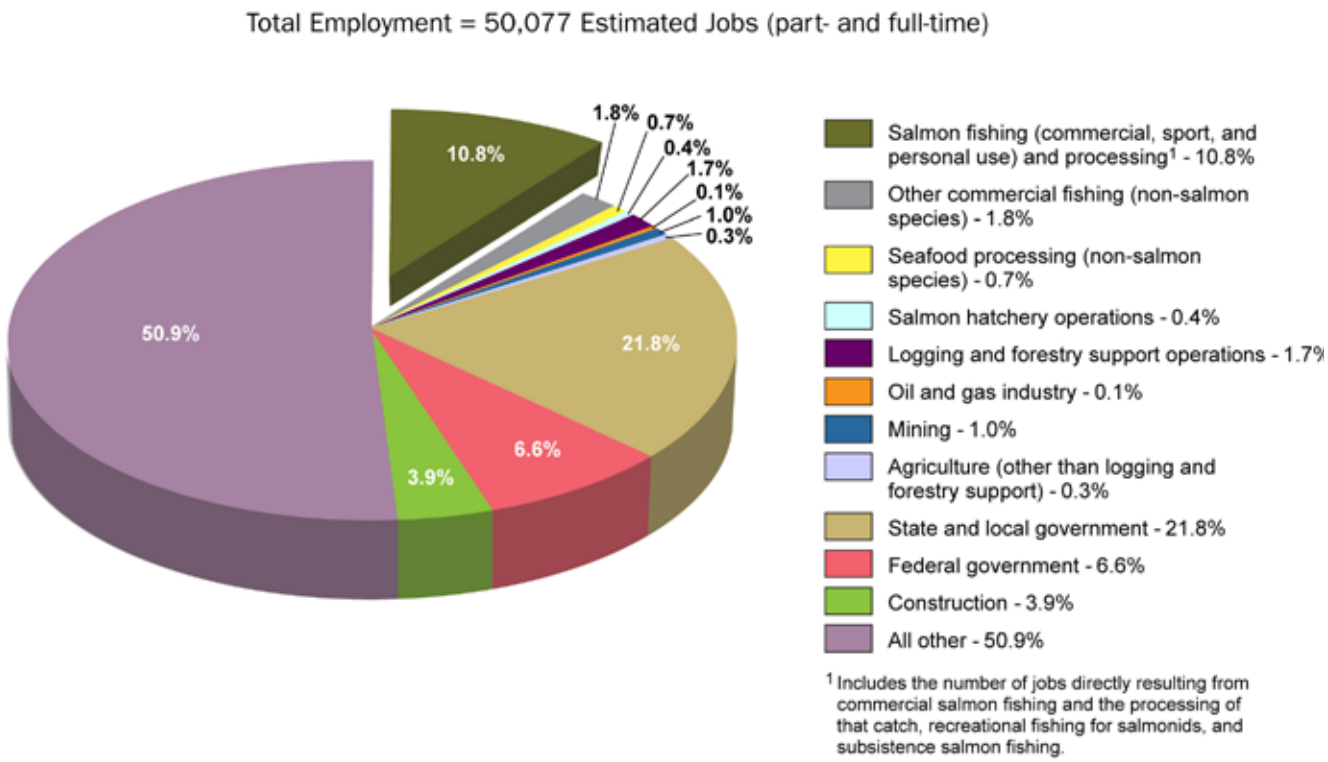
Salmonid resources create value for persons participating in commercial, sport, and personal use/subsistence fisheries (use values), as well as generating economic activity in the local and regional economies affected by these fisheries. Salmonid resources also generate societal values to persons who do not directly participate in these fisheries, but who place monetary value on knowing that salmonid resources are being protected for current and future generations (existence and bequeath values). Although not evaluated in this study, these "non-use" components of value contribute to the total economic value of natural resources such as salmonids (Peterson and Sorg 1987).

As estimated in this study, the use value of salmonid resources to commercial fisheries in southeast Alaska is estimated at $260.9 million in 2007. The value of salmonid resources to recreational fisheries in southeast Alaska is estimated at $204.4 million in 2007, including expenditures of $174.4 million and net economic values of $30.0 million. The value of salmonid resources to personal use/subsistence fisheries is estimated at $0.77 million in 2007, including $453,500 in expenditures and $320,300 in net economic values. In sum, these three components of use values total $466.1 million.

In addition to contributing to use values, the salmonid fisheries of southeast Alaska and hatchery operations contribute to economic activity in the region. Total output associated with the three fisheries and hatchery operations, which includes the additional rounds of economic activity resulting from the multiplier effect, is estimated at $986.1 million. The total number of jobs directly and indirectly supported by southeast Alaska fisheries and hatchery operations are estimated at 7,282, and total personal income (wage earnings, profits, and other income) generated by these fisheries and hatchery operations is an estimated $188.9 million.

Fishing for salmon in southeast Alaska, including commercial, recreational and personal use/subsistence and the processing of comercially-harvested salmon, accounts for an estimated 10.8 percent of total employment in southeast Alaska (*Figure 11)*. (Note that direct employment effects of salmon fishing and the processing of commercially-harvested salmon are compared in *Figure 11* to total employment by industry in the remainder of the economy.) By comparison, logging and forestry support operations generate an estimated 1.7 percent, and mining supports about 1.0 percent of all regional employment. Employment in state and local government accounts for 21.8 percent of the regional jobs, and employment in the Federal government represents 6.6 percent.

Figure 11.
Southeast Alaska Employment by Industry



Sources: Jobs for salmon fishing (commercial, recreational, and personal use/subsistence) were derived for this study based on 2007 fishing activity. Jobs for all other sectors are from 2008 IMPLAN data for southeast Alaska.

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APPENDIX A – ECONOMIC IMPACTS MODELING AND ESTIMATION

This appendix describes the procedures used to estimate the regional economic impacts of the fisheries and hatchery operations in southeast Alaska (SEAK). An IMPLAN-based economic impact model was developed in Excel by Dr. Edward Waters for use in conducting the economic impact analysis. The following steps describe model development and the analysis of economic impacts. References to cell numbers and ranges refer to the Excel spreadsheet in which the model was constructed.

Step 1: Aggregate 2008 IMPLAN data from the following ten boroughs and special areas and use to generate the SEAK IMPLAN model.

- Haines Borough
- Hoonah-Angoon Division
- Juneau Borough
- Ketchikan Gateway Borough
- Petersburg Census Area
- Prince of Wales Area
- Sitka Borough
- Skagway Borough
- Wrangell Borough
- Yakutat Borough

Step 2: Generate "Social Accounting Matrix (SAM)>computable general equilibrium (CGE) reports" for the SEAK IMPLAN model using IMPLAN version 2.

Step 3: Use GAMS (General Algebraic Modeling System) to import the CGE reports files and to construct an "import purged" SAM based on the industry aggregation scheme shown in <SE_AK_2008_INDUSTRY_MAP_(IMPLAN_440).xls>.

Step 4: Configure the SEAK SAM with the following "endogenous" industries (i.e., sectors whose activity levels are determined at least partially by the model).

1 AGRI
2 FISHING
3 OIL_GAS
4 MINING
5 UTILITIES
6 CONSTR
7 FOOD
8 SEAFOOD
9 OTHMANU
10 WHOLESALE

11 TRANSPORT
12 FOODST
13 GASST
14 OTHRETAIL
15 INFO
16 FIRE
17 PROFSERVS
18 EDUSERVS
19 HEALTHSERV
20 EDL
21 OTHSERVS
22 MISC
23 SLGOVENT
24 FEDGOVENT
25 SLGOVI
26 FEDGOVI

Step 5: Include the following endogenous transfer and institutional accounts in the SAM.

27 LAB (employee compensation)
28 PROP (proprietors' income)
29 OPI (other property income: dividends, interest and rent)
30 INDT (indirect business taxes)
31 LOW_HH (the three lowest IMPLAN household income categories)
32 MED_HH (the three middle IMPLAN household income categories)
33 HI_HH (the three highest IMPLAN household income categories)
34 SLGOVT (state and local government)

Step 6: Export the SAM to an Excel file (see tab 'GAMS'). Note that values in the SAM are expressed in million of dollars.

Step 7: Make minor adjustments to certain terms in the SAM to balance row and column sums (see tab 'Modified'). The resulting SAM is shown in tab 'IxI SAM'.

Step 8: Adjust the Fishing industry sector to align Fishing industry output with total 2007 ex-vessel revenues resulting from SE Alaska landings taken from the Alaska Department of Fish & Game website: http://www.cf.adfg.state.ak.us/ (see note 1 below). Elements of the IMPLAN Fishing sector production function were scaled up based on the 2007 ADFG ex-vessel revenue estimates. A corresponding adjustment was made to IMPLAN Fishing industry employment and to estimated inter-industry purchases of local raw fish inputs by the Seafood processing sector. The resulting SAM is shown in tab 'IxI SAM (2)'.

Step 9: Construct the SAM regional economic model using standard matrix algebra techniques (see tab 'IxI SAM MODEL'). The SAM model includes the above 34 endogenous sectors. In this type of model, **"direct effects"** originating from defined external demand (or exogenous spending items) are assumed to stimulate indirect and induced economic activity in the region. **"Indirect effects"** are determined by resulting inter-industry transactions in response to this activity; and **"induced effects"** are triggered by the resulting respending of income and taxes by resident households and local government. Note that a model employing these types of assumptions about the range of endogenous transfer and institutional sectors (i.e., resident households and local government administration) will tend to produce higher multiplier results than would a model that assumes a lower level of endogenous institutional activity.

Step 10: Configure the following impact scenarios for analysis (details are shown in <SEAK_INPUTS_FOR_IO_Analysis_03-12-2010.xls> and <SEAK_Hatchery_Budget.xls>).

Commercial Harvesting & Processing (Note that Washington state FEAM processor margins were used to estimate ex-processor sales.)

Recreational Trip Expenditures & Packages (Note that data were provided by Tom Wegge and mapped to IMPLAN industries and to aggregated SAM sectors.)

- SEAK Residents
- Non-Residents of SEAK

Recreational Equipment & Real Estate (Note that data were provided by Tom Wegge and then adjusted from producer price to purchaser price basis for equipment purchases and mapped to IMPLAN industries and to aggregated SAM sectors.)

- SEAK Residents
- Non-Residents of SEAK

Personal & Subsistence (Note that data were provided by Tom Wegge and mapped to IMPLAN industries and to aggregated SAM sectors.)

Hatchery Operations (Note that expenditure share data from "Yakama Basin Coho and Fall Chinook Acclimation Project" were used to distribute total expenditures to underlying cost categories and mapped to IMPLAN industries and to aggregated SAM sectors).

Step 11: **"Margining"** (i.e., conversion from purchaser prices to producer prices) was performed on the estimated direct expenditures by recreational and personal use anglers in order to properly align expenditure amounts with the industry sector actually providing the goods and services. For example, the price paid for processed food purchased at a local convenience store includes significant transportation and trade margins in addition to the cost of the goods themselves. An attempt was made to "unbundle" these types of transactions to correctly assign expenditures to the list of industries providing the goods and services.

Step 12: Array impact scenarios as consecutive input vectors in cells AK155:AT192 in tab 'Ixl SAM MODEL'.

Step 13: Post-multiply each impact scenario vector by the SAM inverse matrix ((I-A)-1). These **"output impact"** results ($ million) are displayed in cells A193:J233.

Step 14: Calculate **employment impacts** (# of jobs) by multiplying each element of the output impact results vectors by the corresponding sector employment-to-output ratio. These results are displayed in cells A235:J276.

Step 15: Calculate **income impacts** ($ million) by multiplying each element of the output impact results vectors by the corresponding sector income-to-output ratio. These results are displayed in cells A278:J319.

Notes:

1. While IMPLAN generally does a good job tracking actual employment and payroll in most regional industries, notable exceptions are the agriculture and fishing sectors, where employment is often part-time or seasonal and therefore not subject to reporting requirements under state unemployment insurance programs. As such, employment and compensation amounts for these "non-covered" industries reported in state employment data and also in IMPLAN tend to be substantially underestimated.

2. **"Leakage"** (i.e., loss of income from the regional spending stream) is determined in regional economic models by (1) the level of goods and services purchased from outside a region ("Imports"), and (2) the relative number of non-resident workers employed in the region. IMPLAN estimates the proportion of non-labor inputs in a region using regional purchase coefficients (RPCs) that are calculated within IMPLAN by a statistical technique that uses available regional data. In the SE Alaska SAM model, the combined "non-services" industries (Agriculture, Fishing, Mining, Utilities, Construction and Manufacturing) imported 39% of their non-labor inputs. The combined "services" sectors (Trade, Transportation, Information, Finance, Insurance, Real Estate, Professionals, Private Education, Health, Accommodations, Restaurants, etc.) imported 30% of their non-labor inputs. Also, about 39% of regional households' purchases were assumed to be imported from outside SE Alaska, and about 19% of employee compensation was assumed paid to nonresident workers.

SOUTHEAST ALASKA

By the Numbers 2019

CHANGES **2017 TO 2018**

Regional **population** decreased by **80 people** to **72,876**

Labor force increased by **2 jobs** to **45,642** jobs

Total Government jobs decreased by **108 jobs** to **13,148**

Cruise **Passengers** increased by **7% to 1.2 million**

Pounds of Seafood Landed in the region decreased by **118 million pounds,** a decrease of **39%**

Health Care Jobs in the region increased by **121**, a gain of **3%**

SOUTHEAST ALASKA'S **ECONOMY**

The Southeast Alaska summer of 2019 was filled with record-high temperatures and a historic number of visitors spending money across the region's communities. While it was the picture of prosperity, the region's complex economic framework is thriving in some segments, while struggling in others.

Southeast Alaska's shrinking State sector is down by more than 800 jobs over 7 years. Long the top provider of wages in the region, state government is on track to be a distant third in coming years – after municipal government and tourism – and a bountiful fishing season would make the state the fourth largest provider of wages. Alaska's fiscal health has been managed to the detriment of Southeast Alaskans, as short-term gains took priority over the long-term economic health of the State sector, and State savings were depleted without full implementation of a sustainable fiscal solution. As a result the region has been embroiled in economic uncertainty that is a problematic companion to a thriving private sector.

The regional health care industry had been optimistic about the trajectory of the economic environment, adding nearly 500 jobs and $50 million in wages over the last four years to support the growing health care needs of an aging population. However, steep state cuts to Medicaid funding, compounded by the potential loss of matching federal dollars, have reversed the growing business confidence of that sector. The region's mining sector has been growing, while the ship building and construction sectors have contracted.

Fishing remains mercurial. Southeast Alaska lost nearly 700 seafood jobs in the past four years, with wages down by $22 million. By volume, the catch for 2018 was the lowest in decades, but strong seafood prices have offset losses. The so-called trade war with China is having deleterious impacts on several Southeast industries, including seafood, timber, and mining.

Through all of this, the visitor industry has provided a critical counter-balance to a capricious economy. In just seven years, the tourism sector added more than 2,000 annualized jobs to Southeast communities, increasing wages by $85 million. During the summer of 2020, 1.44 million visitors are projected to spend nearly $800 million during their Southeast Alaska holidays.

The collective result was a flat economy in 2018. Southeast Alaska decreased in population by 80 people, added two jobs, and overall wages grew incrementally. The region persevered through several rough years, but Southeast Alaskans are resilient and remain optimistic about the future. More than a quarter of regional businesses plan to add jobs in the coming year, and 68% of business leaders expect the coming year to be positive and/or better than last year.

SOUTHEAST **2020 STRATEGIC PLAN** SUMMARY

The Southeast Alaska 2020 Economic Plan, is a five-year strategic plan for the region. The membership worked together to develop an overall vision statement, 46 objectives, and 7 priority objectives, along with regional and industry specific SWOT analyses. More than 400 people representing small businesses, tribes, Native organizations, municipalities, and nonprofits were involved in various elements of the planning process. In 2018 this work received a national NADO Innovation Award. The Plan's objectives are listed below.

Transportation

- **Priority** Minimize Impacts of Budget Cuts to AMHS and Develop a Sustainable Operational Model.
- Road Development.
- Move Freight to and from Markets More Efficiently.
- Ensure the Stability of Regional Transportation Services Outside of AMHS.

Energy

- **Priority** Promote Priorities of the Regional Energy Plan, Including Infrastructure and Diesel Displacement.
- Support Community Efforts to Create Sustainable Power Systems that Provide Affordable/Renewable Energy.
- Complete Regional Hydrosite Evaluation for Southeast Alaska.

Maritime

Maritime Industrial Support

- **Priority** Maritime Industrial Support Sector Talent Pipeline: Maritime Workforce Development Plan.
- Continue to Grow the Regional Maritime Sector.
- Increase Access to Capital for the Regional Maritime Industrial Support Sector.
- Support Capital Investments in Expanded Marine Industry Support Infrastructure.
- Harbor Improvements.
- Examine Arctic Exploration Opportunities That the Region as a Whole Can Provide.

Seafood Industry

- **Priority** Mariculture Development.
- **Priority** Full Utilization and Ocean Product Development.
- Increase Energy Efficiency and Reduce Energy Costs.
- Regional Seafood Processing.
- Seafood Markets.
- Sea Otter Utilization and Sustainable Shellfish.
- Maintain Stable Regulatory Regime.
- Seafood Workforce Development.

Visitor Industry

- **Priority** Market Southeast Alaska to Attract More Visitors.
- Improve Access to Public Lands.
- Increase Flexibility in Terms of Permit Use.
- Increase Yacht and Small Cruise Ship Visitations.
- Improve Communications Infrastructure.
- Advocate for Funding to Maintain Existing Recreational Infrastructure.
- Grow Cultural and Arts Tourism.

Timber Industry

- **Priority** Provide an Adequate, Economic and Dependable Supply of Timber from the Tongass National Forest to Regional Timber Operators.
- Stabilize the Regional Timber Industry.
- Work with USFS to Direct Federal Contracts Toward Locally-Owned Businesses.
- Support Small-Scale Manufacturing of Wood Products in Southeast Alaska.
- Continue Old-Growth Harvests Until Young-Growth Supply is Adequate.
- Community-Based Workforce Development.
- Update Young Growth Inventory.

Other Objectives

- **Healthcare:** Meet Regional Workforce Development Needs.
- **Research:** Attract Science and Research Jobs to Southeast Alaska.
- **Housing:** Support Housing Development.
- **Food Security:** Increase Production, Accessibility, and Demand of Local Foods.
- **Communications:** Improved Access to Telemedicine in Southeast Alaska.
- **Marketing:** Market Southeast Alaska as a Region.
- **Solid Waste:** Regional Solid Waste Disposal.
- **Education:** Partner with University & K-12 to Meet Workforce Needs
- **Arts:** Increase Recognition of Southeast Alaska's Thriving Arts Economy.
- **Mining:** Minerals & Mining Workforce Development.
- **Cultural Wellness:** Support Activities and Infrastructure that Promote Cultural Wellness.

A Message from **Southeast Conference**

Executive Director
Robert Venables

We truly are living in "interesting times." In many economic sectors, the region is holding its own or doing well, while others struggle. The pervasive uncertainty that envelopes the region and state is cited as a top reason industry hesitates to invest, expand and grow. A stable fiscal policy is essential.

Southeast Alaska is blessed with the natural resources that can provide the basis for a strong economy. Our fisheries, mariculture, mining, timber and energy "endowment" is second to none. We need to focus on creating an environment that attracts and nurtures investment in those opportunities.

Also critical is the availability of skilled labor. Southeast Conference continues to be involved in workforce development and is a strong supporter of our University as a primary institution for preparing the next generation of workers.

Infrastructure and transportation must be present to support new and growing businesses. Southeast needs adequate ports, harbors, airports, roads, and most certainly a viable ferry system. Changes to AMHS are here, but we have a plan – and more importantly, a process guided by statewide stakeholders with a passion to see it succeed in its mission.

Our award-winning Economic Plan is our guide. This year we use it to measure how we've done the last 5 years as we update it toward our goal of strong economies, healthy communities and a quality environment in Southeast.

Robert Venables, Meilani Schijvens, and Alec Mesdag show off the National Association of Development Organizations 2018 Innovation Award, which Southeast Conference won for the Southeast Alaska 2020 Economic Plan. Photo by Heather Holt.

Incoming President
Alec Mesdag

Alec Mesdag is the Director of Energy Services for Alaska Electric Light and Power in Juneau. Together with his wife, they own and operate Salty Lady Seafood Company, a mariculture farm in Bridget Cove.

I lived in Portland for about five years. Among many strange things about living there, "Keep Portland Weird" stickers are all over the place. When I moved back to Juneau and attended my first Annual Meeting, it struck me that, in Southeast, we don't need to remind each other. I think that's the greatest advantage Southeast Conference has as an economic development organization. The membership and region have great diversity of thought, culture, and experience, and we welcome one another. That mixture drives innovation, and innovation drives growth.

One of the less-heralded bonds of our region is the need to constantly battle with visitors and in-laws from Portland about what it takes to stay warm when wet. That fundamental requirement for successfully going outside in Southeast Alaska helps underpin an ability to distinguish between reality and dogma, and that works as an analogy for what impressed me and encouraged me to become more involved in Southeast Conference. The organization's structure and economic plan acknowledge the need for continuous adaptation by government and the private sector, so the two complement each other's work without creating obstacles and distortions. That is why membership engagement in the Southeast Alaska Economic Plan has more potential to shape the trajectory of our region's economy than any other factor within our control.

The mission of Southeast Conference is to **undertake and support activities that promote strong economies, healthy communities and a quality environment in Southeast Alaska**. As the state and federally-designated regional economic development organization, Southeast Conference serves as the collective voice for advancing the region's economy. We have 200 member organizations representing 1,200 people from 32 regional communities. We started 60 years ago with a group of people supporting the establishment of a regional transportation system, leading to the formation of the Alaska Marine Highway System. Our members stayed together through more than a half-century to focus on concerns unique to the region.

Image Credits: Front cover photo of Juneau Waterfront by Zachary Hanna. Back cover photo by Bethany Goodrich, Sustainable Southeast Partnership. Icons/map by Avery Veliz.

Four Years of Change: 2014 to 2018

Table tracks key Southeast indicators over the past 4 years, along with associated changes.

Demographics	2014	2018	% Change 2014-2018	Change 2014-2018
Population [1]	74,432	72,872	-2%	-1,556
Ages 65 and older [2]	9,243	11,089	20%	1,846
Under Age Five [2]	4,622	4,146	-10%	-476
Twenty somethings [2]	9,398	8,447	-10%	-951
K-12 School District Enrollment [3]	11,804	11,334	-4%	-470
General Economic Conditions				
Total Labor Force (jobs, includes self-employed & USCG) [1,5,6]	45,694	45,642	0%	-52
Total Job Earnings [1, 5, 6]	$2.17 billion	$2.28 billion	5%	+$109 million
Total Private Sector Payroll [1, 6]	$1.41 billion	$1.51 billion	7%	+$97 million
Average Annual Wage [1]	$47,593	$50,023	5%	$2,430
Annual Unemployment Rate [1]	7.1%	6.0%	-1.1%	-1.1%
Top Economic Sectors	**2014**	**2018**	**% Change**	**Change**
Government	**Public Sector: 35% of all employment earnings**			
Total Government Employment [1, 5]	13,602	13,148	-3%	-454
Federal Employment [1, 5] (8% of all employment earnings)	2,110	2,111	0%	1
State Employment [1] (14% of all job earnings)	5,504	4,771	-13%	-733
City and Tribal Employment [1] (14% of all job earnings)	5,988	6,266	5%	278
Total Government Payroll (includes USCG) [1, 5]	$765.8 million	$776.9 million	1%	+$11 million
Total State of Alaska Payroll	$311.3 million	$283.3 million	-9%	-$28 million
Visitor Industry	**Key Industry: 11% of all employment earnings**			
Total Visitor Industry Employment [1, 6]	6,923	8,004	16%	1,081
Total Visitor Industry Wages/Earnings [1, 6]	$188.5 million	$249.3 million	32%	+$60.8 million
Total Southeast Alaska Passenger Arrivals	1,359,897	1,618,311	19%	258,414
Cruise Passengers [10]	967,500	1,169,000	21%	201,500
Total Air Passenger Arrivals from Outside SE [11]	372,197	435,476	17%	63,279
Total AMHS Passengers from Outside SE [12]	20,200	13,835	-32%	-6,365
Commercial Fishing & Seafood Industry	**Key Industry: 10% of all employment earnings**			
Total Seafood Employment (includes fishermen) [1, 6]	4,372	3,711	-15%	-661
Total Seafood Employment Earnings [1, 6]	$259.0 million	$237.4 million	-8%	-$21.6 million
Pounds of Seafood Processed [7]	232.9 million	132.7 million	-42%	-97.8 million
Pounds Landed (commercial seafood whole pounds by SE residents) [8]	300.0 million	185.2 million	-38%	-114.8 million
Estimated Gross Earnings (ex-vessel value of pounds landed) [8]	$277.1 million	$246.9 million	-11%	$30.2 million
Shared Fish Taxes [13]	$5.8 million	$4.5 million	-22%	-$1.2 million
Health Care Industry (public & private health)	**Key Industry: 11% of all employment earnings**			
Health Care Employment [1, 6]	3,523	3,990	13%	467
Health Care Wages [1, 6]	$194.8 million	$243.3 million	25%	+$48.5 million
Maritime Economy (Includes employment from all industries)	**Top Sector: 27% of Private Sector employment earnings**			
Private Maritime plus USCG Employment [1,5,6]	6,768	6,273	-7%	-495
Private Maritime plus USCG Wages [1,5,6]	$395.5 million	$396.8 million	0%	+$1.3 million
Other Selected Statistics	**2014**	**2018**	**% Change**	**Change**
Construction Employment [1, 6] (6% all employment earnings)	2,168	1,909	-12%	-259
Mining Employment [1] (4% of all employment earnings)	783	889	14%	106
Price of Gold [7]	$1,266	$1,268	0%	$2
Total Southeast AMHS Ridership [12]	242,648	179,312	-26%	-63,336
Cost of Living: Consumer Price Index [1]	215.8	225.5	5%	9.7
Housing Starts: Housing Permitted /Completed [4,1]	321	188	-41%	-133
Avg. Daily Volume ANS Oil Production (mbbls/day) [14]	512,810	508,601	-1%	-4,209
Annual Avg. Domestic Crude WTI Oil Prices (in $/Barrel) [14]	$97.88	$71.71	-27%	-$26

Sources: [1]Alaska Department of Labor (ADOL); [2]ADOL Southeast Alaska Population by Age, 2014 to 2018; [3]Alaska Department of Education and Early Development; [4]Based on the quarterly Alaska Housing Unit Survey, a survey of local governments and housing agencies; [5] US Coast Guard; [6] 2017 US Census Nonemployer (self-employment) Statistics; [7]Kitco Metals Inc.; [8]ADF&G Southeast Alaska Commercial Seafood Industry Harvest and Ex-Vessel Value Information, 2014-2018; [10]Cruise Line Agencies of Alaska; [11]US Bureau of Transportation Statistics (RITA); [12]Alaska Marine Highway System data; [13]Shared Taxes and Fees Annual Report FY17, ADOR; [14]Alaska Department of Revenue *Crude Oil and Natural Gas Prices.*

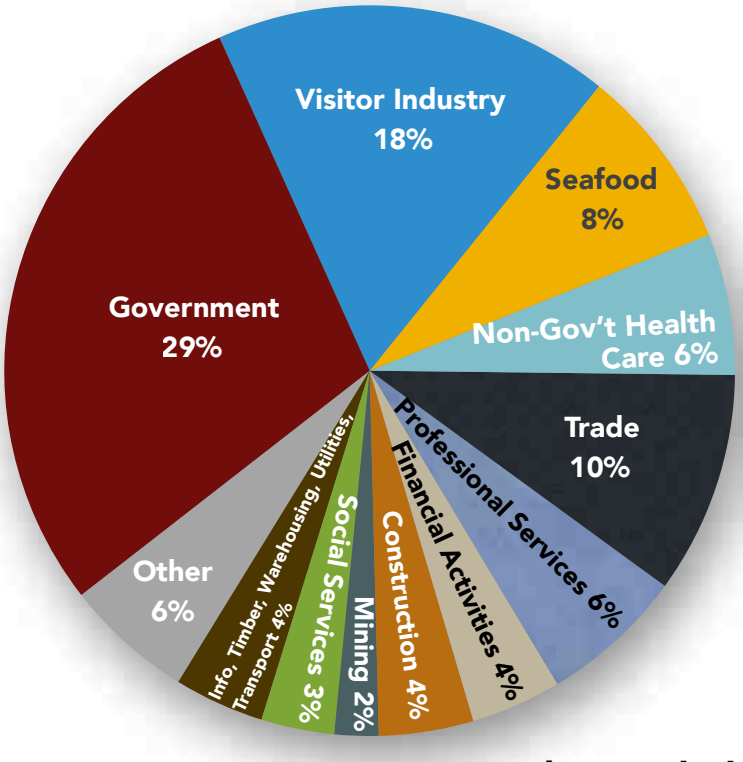
The Whole **Southeast Alaska Economy** 2018

In 2018, Southeast Alaska gained 380 year-round equivalent jobs and $17 million in workforce earnings over 2017. Approximately a quarter (26.1%) of regional workers are non-residents.

Annual Average Jobs

45,642 Jobs

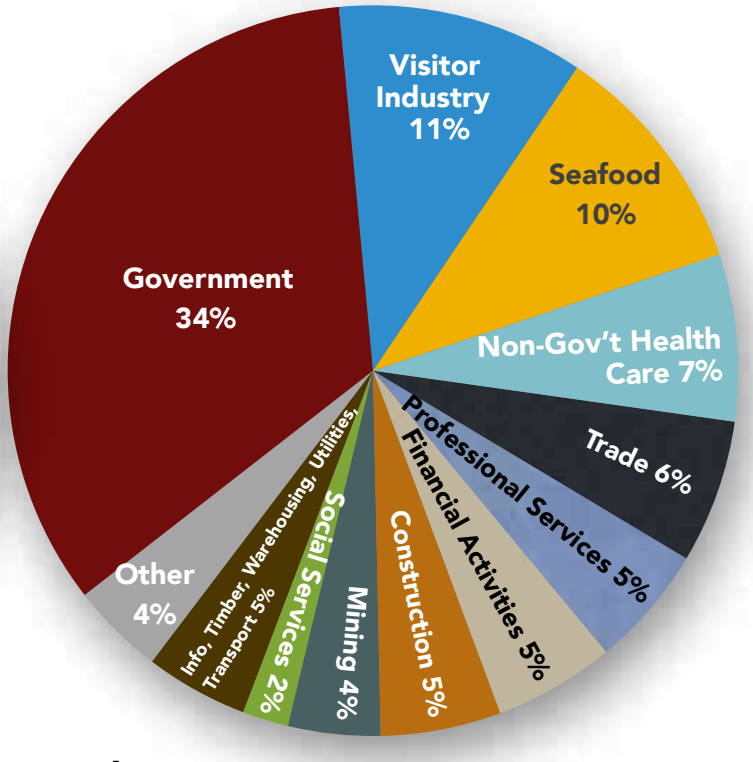
Up 2 Jobs in 2018 +0%



Employment Earnings

$2.3 Billion Workforce Earnings

Up $86 Million +4%



2018 Southeast Alaska Employment Earnings

	Employment Related Earnings			Employment Numbers		
	Wages (2018)	Self-Employment Earnings (2017)	Total Earnings	Annual Average Employment (2018)	Self-Employed (2017)	Total Employment
Government (includes Coast Guard)	$721,459,750	$55,467,580 CG*	**$776,927,330**	12,486	662 CG*	**13,148**
Visitor Industry	$216,101,975	$33,241,000	**$249,342,975**	7,037	967	**8,004**
Seafood Industry	$61,983,458	$175,459,000	**$237,442,458**	1,458	2,253	**3,711**
Trade: Retail and Wholesale	$120,405,013	$24,666,000	**$145,071,013**	3,903	587	**4,490**
Health Care Industry (private only)	$154,278,150	$14,330,000	**$168,608,150**	2,615	237	**2,852**
Construction Industry	$88,673,702	$32,972,000	**$121,645,702**	1,331	578	**1,909**
Financial Activities	$52,935,761	$69,216,000	**$122,151,761**	1073	757	**1,830**
Professional and Business Services	$78,756,495	$44,242,000	**$122,998,495**	1,606	1,304	**2,910**
Mining Industry	$92,753,768	$274,000	**$93,027,768**	879	10	**889**
Social Services	$42,218,089	$4,224,000	**$46,442,089**	1,289	187	**1,476**
Information (publishing, broadcasting, telecomm.)	$22,074,083	$1,474,000	**$23,548,083**	483	58	**541**
Timber Industry	$16,739,683	$2,025,000	**$18,764,683**	280	57	**337**
Warehousing, Utilities, & Non-Visitor Transport	$46,340,395	$15,414,000	**$61,754,395**	777	166	**943**
Other	$66,819,751	$27,657,000	**$94,476,751**	1,677	925	**2,602**
Total	$1,781,540,073	$500,661,580	$2,282,201,653	36,894	8,748	45,642

Sources: Alaska Department of Labor 2018 Employment & Wage data; 2017 (latest available) US Census Nonemployer (self-employment) Statistics; Active Duty Military Population by 2018, ADOL.*These cells in Government refer to 2018 active duty Coast Guard personnel employment and wages, and not self-employment data.

Notes: Seafood Industry includes animal aquaculture, fishing & seafood product preparation, and Southeast Alaska resident commercial fishermen (nonresident fishermen & crew who did not report income are excluded). **Visitor Industry** includes leisure & hospitality, and visitor transportation (air, water, scenic). **Timber** includes forestry and logging support activities for forestry, and wood product manufacturing.

Southeast Tourism Statistics 2020

Estimated Regional Visitor Industry Projections for 2020

43
Cruise Ships in Southeast

606
Cruise Ship Voyages

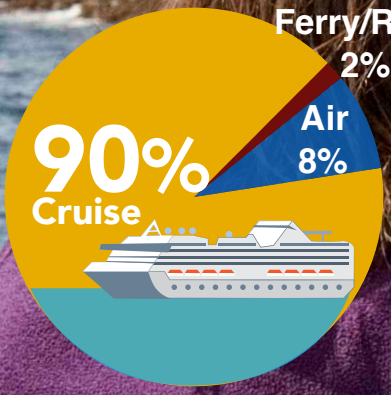
1.44
Million Cruise Passengers

$793
Million in Tourist Spending

2020

65%
Increase in cruise passengers from 2010

Tourist Arrivals in Southeast by Mode

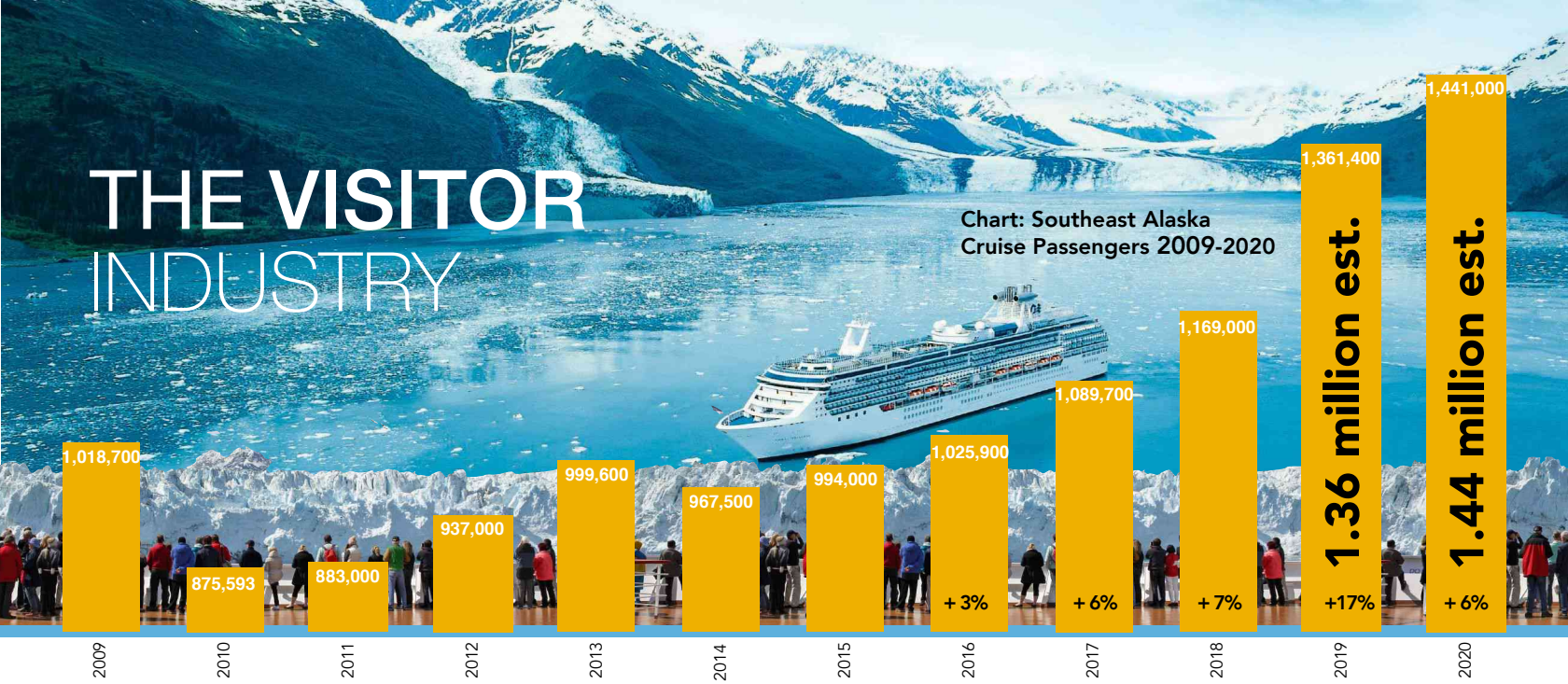


Southeast Alaska Cruise Passengers Arrivals by Port

Port	2018 actuals	2019 projected	2020 projected	% of all passengers	Change 2018 to 2020
Juneau	1,151,094	1,325,792	1,421,929	99%	24%
Ketchikan	1,053,764	1,212,033	1,275,636	89%	21%
Skagway	957,847	1,044,107	1,070,610	74%	12%
Gustavus (Glacier Bay)	569,807	636,811	584,528	41%	3%
Hoonah (Icy Strait Point)	189,000	272,327	404,033	28%	114%
Sitka	158,362	224,379	210,399	15%	33%
Haines	57,798	67,799	78,322	5%	36%
Wrangell	11,974	17,342	17,742	1%	48%
Total Southeast	1,169,000	1,361,400	1,441,000	100%	23%

Sources: Cruise voyage and passenger number projections provided by Cruise Lines International Association Alaska. Excludes numbers for some smaller cruise ships. Spending and mode projections developed by Rain Coast Data based on CLIAA, AVSP VII, US Bureau of Transportation Statistics, and Alaska Marine Highway System data.
Photo Credit: Tourists aboard an Allen Marine vessel in Sitka, by Peter Metcalfe.

THE VISITOR INDUSTRY



Visitor Industry
8,004 Annualized Jobs

Up 265 Jobs in 2018 +3%
Wages up 8%

The visitor industry is the largest private sector industry in Southeast, both in jobs and, since 2016, in total workforce earnings (see chart on page 5). Indeed, if the industry continues to grow it is set to eclipse both the municipal and state government sectors in total wages (it is already larger than both in terms of employment) and become the region's largest sector overall. The visitor industry accounted for 18% of regional employment (8,004 annual average jobs) and a quarter of all private sector employment.

Since 2011, tourism has added more than 2,000 year-round equivalent jobs to the Southeast economy. Those working in the visitor industry earned $249 million in 2018—or 11 percent of all regional employment income. The average annualized wage in the visitor industry is $31,152, significantly lower than the average regional wage of $50,002, but it is a figure that has been steadily increasing over time.

In 2018, 1.6 million air, ferry, and cruise passengers came to Southeast Alaska from outside the region, a 19% increase over 2014. Airline passenger traffic from outside the region grew 17%, and cruise passenger traffic to the region increased by 13%. However, ferry arrivals from outside the region fell by 32% due to decreases in funding and service.

Cruise Ship Traffic

Most passengers arriving in the region come by cruise ship than any other mode. When tourists only are considered, that figure will be 90% by 2020. Cruise passenger traffic has seen massive increases in recent years. Between 2010 and 2020, the number of cruise passengers arriving in the region is projected to increase by a staggering 65%, including two-year growth of 23% expected between 2018 and 2020. Southeast Alaska will receive 5% of all global cruise ship passengers in 2019.

In 2019, 40 cruise ships are scheduled to visit the region, carrying 1.36 million passengers on 577 voyages. In 2020, ten new ships and 29 additional port calls are expected to be added, while 7 ships will be phased out of the region. Lines with new ships will include Carnival, Princess, Royal Caribbean, Norwegian, and Oceania. Lines that plan to reduce their Alaska fleet include Holland America, Crystal, and Azamara, which has no ships scheduled to visit Alaska in 2020.

Key Economic Driver

Southeast Alaska is the most visited part of the state, with two-thirds of all tourists coming to the region. One-third of all Alaska visitor spending occurs in Southeast, where visitors are expected to spend nearly $800 million in 2020.

Increased Jet Service

For the fourth year in a row, in 2018 Southeast Alaska saw a record-breaking number of airline passengers from outside the region, with 435,476 arrivals. However, in 2019 air passenger numbers declined. As of July 2019, airline passenger arrivals were down 4% over the first half of 2018.

Visitor Outlook

The visitor industry has the strongest outlook of all Southeast Alaska industries. Alaska's popularity as a visitor destination has continued to grow. In 2018, Glacier Bay was rated the best cruise designation in the world by cruisers. More Americans are traveling due to a strong national economy and international travel destinations are increasingly perceived to have security risks. Cruise passenger arrivals are expected to continue to rise as larger, higher-capacity vessels visit the region. Along with increased visitors, the number of jobs and associated income in this sector will continue to rise.

However, Southeast's strong visitor economy is tied to a strong national economy. As more signals suggest the possibility of a national recession, the region should be prepared for this sector to see a reduced number of visitors if a recession does occur.

Sources: Combination of ADOL 2018 Employment and Wage data and 2017 US Census Nonemployer (self-employment) Statistics; McDowell Group; US Bureau of Transportation Statistics (RITA); Alaska Marine Highway System; Cruise Line Agencies of Alaska; Cruise Market Watch; Cruise Critic; Juneau International Airport Passenger Statistics; Economic Impact of Alaska's Visitor Industry. Forecast 2020 U.S. Department of Commerce, US Office of Travel and Tourism Industries. OMB budgets. Cruise Lines International Association Alaska.
Note: In this analysis, the visitor industry includes leisure and hospitality businesses, along with air, water & scenic transportation companies.
Photo Credit: Cruise Lines International Association Alaska & Shutterstock 290564897.

SOUTHEAST MARITIME: 6,273 Jobs

Private and US Coast Guard Maritime Employment & Workforce Earnings (-2 jobs 2017-2018)

Fishing & Seafood Processing
Jobs: **3,508**
Wages: **$237.4 M**
Change in jobs 2014-18: **-20%**

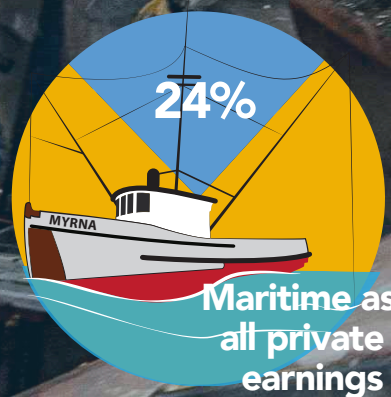
Marine Tourism
Jobs: **1,258**
Wages: **$47.2 M**
Change in jobs 2014-18: **+68%**

US Coast Guard
Jobs: **793** (Active Duty and Civilian)
Wages: **$66.4M**
Change in jobs 2014-18: **+5%**

Marine Transportation
(Excluding Tourism)
Jobs: **367**
Wages: **$24.8M**
Change in jobs 2014-18: **-5%**

Ship Building, Repair, Marinas
Jobs: **326**
Wages: **$19.1 M**
Change in jobs 2014-18: **+73%**

Marine-Related Construction
Jobs: **21**
Wages: **$1.8 M**
Change in jobs 2014-18: **-75%**



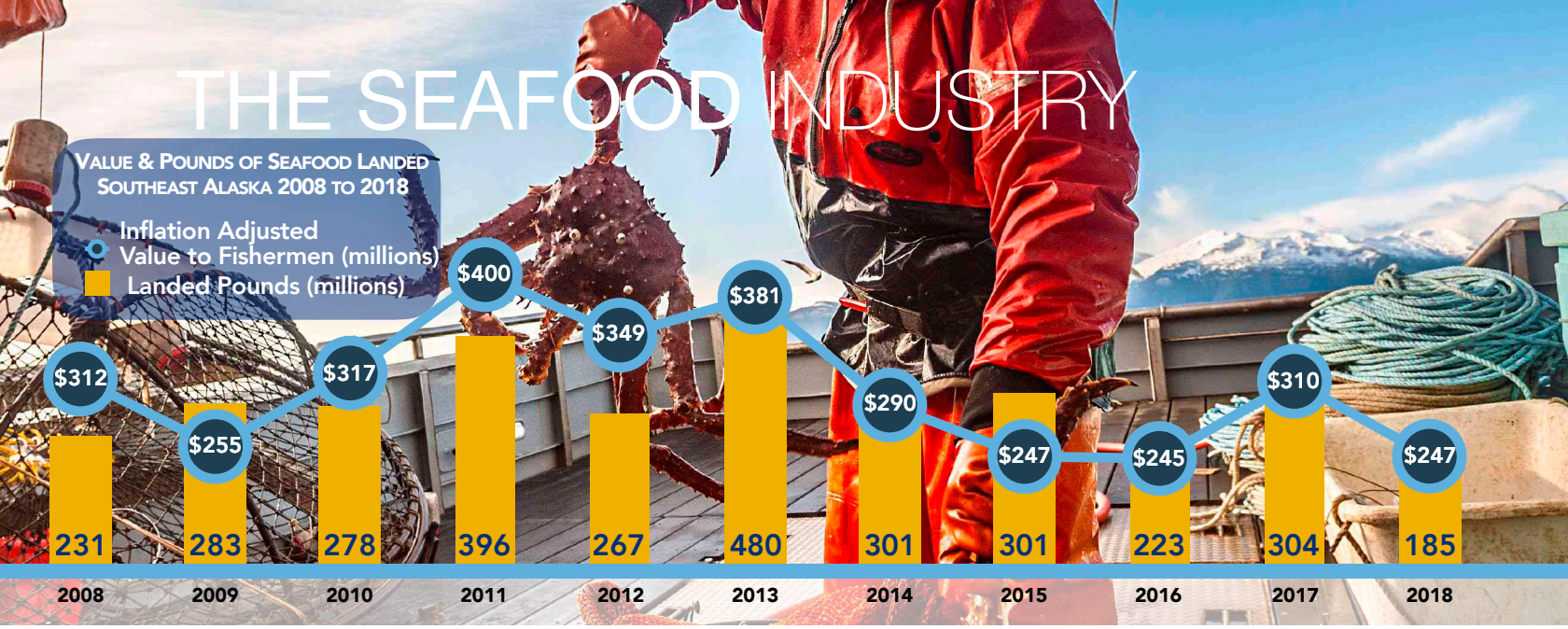
Maritime as a % of all private sector earnings in SE

Southeast Private & USCG Maritime Economy 2014-2018

Total Jobs 2018: **6,273**
Total Wages 2018: **$396.8 Million**
Change in jobs since 2014: **-495**
Change in jobs by percent: **-7%**
Change in earnings since 2014: **-$1.3 Million**
Change in earnings by percent: **-0.3%**

Photo by Chris Miller Photography.
For methodology, notes, and sources, see *www.raincoastdata.com/sites/default/files/Maritime by the Numbers.pdf*

THE SEAFOOD INDUSTRY



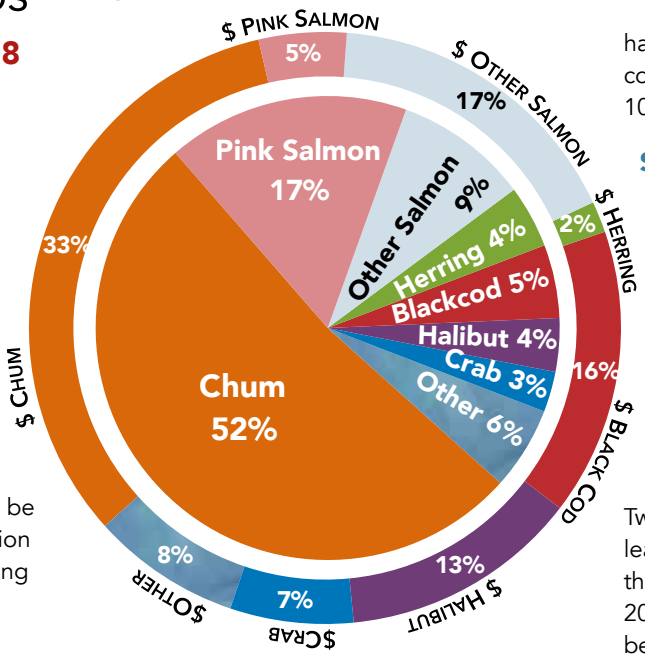
Southeast Seafood Industry 3,711 Jobs

Down 118 Jobs in 2018

The regional 2018 fishing season was significantly below the ten-year average, and total pounds landed was the lowest since the 1980s. Poor pink salmon and herring returns are primarily to blame. The Southeast Alaska seafood harvest in 2018 was 185 million pounds with an ex-vessel value of $247 million. An "average" year would have netted 117 million more pounds of seafood, and earned fishermen $57 million in direct earnings. Fishermen caught 100 million fewer pounds of pink salmon than would be expected in an average year, and 19 million fewer pounds of herring. However, a strong chum return helped offset some of these losses.

Seafood Landed in SE Alaska by Species, 2018

Outer ring = % of harvest by DOLLAR value: $247 million
Inner pie = % of harvest by POUNDS landed: 185 million



Key Economic Driver

The regional seafood industry (including commercial fishing and seafood processing) generated 3,711 annual regional jobs and $237 million in earnings in 2018, making up 8% of jobs in the region and 10% of earnings. This represents 118 fewer jobs than last year, and a loss of 650 jobs since 2015.

The majority of the statewide catch of Chinook, coho, keta (chum), shrimp, Dungeness crab, and the dive fisheries occurs in Southeast Alaska. In 2018, the five salmon species represented 78% of the regional seafood catch by volume, and just over half of total ex-vessel value ($135 million). Halibut and black cod, at 9% of the total catch, accounted for nearly one-third of total catch value in 2018.

Pink salmon were 76% below 10-year averages. Warm sea temperatures between 2013 and 2016 are being blamed for the reduction in pink salmon.

There was significant variability across fisheries in 2018. Southeast Alaska's 2018 king salmon season was the worst in 57 years of record-keeping, and 2019, with limits set by the Pacific Salmon Treaty, will be even worse. The sockeye salmon harvest was also one of the poorest on record, 47% below 10-year average harvest levels, as was Dungeness crab. In contrast, the 2018 chum salmon return was the 10th largest since statehood.

Seafood Processing

In 2018, shore-based seafood facilities in Southeast Alaska processed 133 million pounds of seafood, with a wholesale value of $439 million, a 42% decrease in seafood pounds processed over 2017. State-shared fisheries taxes for processing activity in FY18 generated $4.5 million for regional communities.

Seafood Industry Outlook

Two-thirds of regional seafood business leaders reported an unfavorable outlook for their industry. While the preseason forecast for 2019 of 44 million salmon was somewhat below typical years, only 60% of that number had been realized by the late summer 2019, mostly due to a poor Chum return. Only a quarter of the expected Chum had been captured by early September.

Uncertainty related to harvest fluctuations, a return of warming ocean temperatures (known as "the blob"), Chinese tariffs, commercial fisheries budget cuts, and global advances in salmon farming all contribute to growing concerns. Retaliatory tariffs imposed by China have already caused a one-third drop in US seafood sales, and more seafood tariffs are set to be enacted on December 15th. Meanwhile, the regional mariculture industry has been growing.

Sources: Combination of ADOL 2018 Employment and Wage data; 2017 US Census Nonemployer (self-employment) Statistics; ADF&G Seafood Production of Shorebased Plants in Southeast Alaska; ADF&G Southeast Alaska Commercial Seafood Industry Harvest and Ex-Vessel Value Information; Run Forecasts and Harvest Projections for 2019 Alaska Salmon Fisheries and Review of the 2018 Season; ADF&G March 2019; Shared Taxes and Fees Annual Report FY18, ADOR; Alaska Commercial Salmon Harvests and Ex-vessel Values, ADF&G. **Seafood Industry** includes animal aquaculture, fishing, & seafood product preparation and Southeast Alaska resident commercial fishermen (nonresident fishermen & crew who did not report income are excluded). Laine Welch Fish Factor. **Photo**: Chris Miller Photography.

THE HEALTH CARE INDUSTRY

24% wage growth in 3 years

Health Care
3,990 Jobs

Up 121 Jobs in 2018
+3.1%

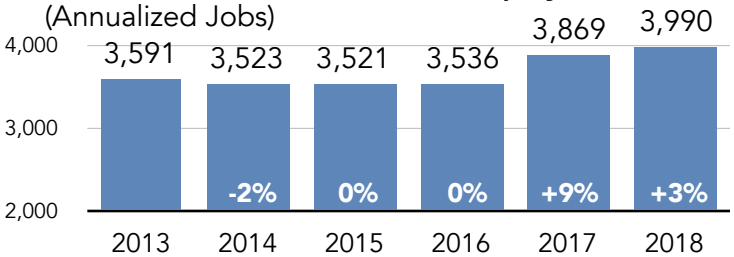
Since 2017, regional health care jobs have finally been growing after years of remaining essentially flat, and even declining.

In 2018, there were 3,990 annual average (year-round equivalent) health care jobs in Southeast Alaska, comprising 9% of the total regional workforce. Between 2016 and 2018, total health care employment increased by 12.5%, for a gain of more than 450 jobs. High worker replacement rates, partly due to the high use of traveling health care workers, means that the total number of people working in the regional health care industry is higher than the annual average job number, with more than 5,000 workers participating in the Southeast Alaska's health care industry in 2018.

The top health care employers in the region are Southeast Alaska Regional Health Consortium (SEARHC) with nearly 1,200 staff, Juneau's Bartlett Regional Hospital with approximately 650 employees, and PeaceHealth Ketchikan Medical Center with nearly 500 workers. Just over a quarter (28%) of health care jobs (1,130) are government jobs, including municipal hospital workers and State of Alaska Pioneer Homes staff.

Regional health care wages have grown significantly in recent years, increasing by $47 million, or 24%, over the past three years, from $195 million in 2015 to $243 million in 2018. Southeast Alaska's health care workers earned 11% of all regional wages last year. The total economic impact of the health care industry in Southeast Alaska in 2018 was $569 million.

Southeast Alaska Health Care Employment
(Annualized Jobs)



Despite growing health care needs in the region due to an aging populace and growing patient volumes, health care employment and wages stagnated through 2016 amid political uncertainty over national health care policy, proposed Medicare cuts, and cuts to state Medicaid. Once that uncertainly appeared to be resolved, hiring increased significantly.

Nationally competition for health care jobs is fierce. With more health care workers needed nationally to support an aging America and more Americans accessing health care, there is a shortage of medical professionals entering the workforce. Medical and nursing schools graduate a similar number of students as they did two decades ago, and baby boomers are retiring. Regional wages were found not to be competitive enough to attract and retain sufficient talent. Southeast providers had to adjust wages upward to remain competitive in attracting workers, resulting in the significant total wage increase.

Whether or not this trend continues is up in the air, as political uncertainty surrounding health care is back.The Spring 2018 Southeast Alaska Business Confidence survey showed that the health care sector was the most optimistic among all regional sectors. However, in December 2018 the governor proposed steep cuts to health care and Medicaid spending across the State of Alaska, which would also result in the loss of matching federal dollars. There are 19,815 individuals enrolled in Medicaid across the region. By Spring 2019 the annual confidence survey showed that health care sector leaders dropped to become the least optimistic in the span of just a year. (See page 17).

In 2019, Southeast Conference conducted a Southeast Alaska health care workforce survey to measure the future workforce needs of regional health care providers along with the obstacles to meeting those needs. Top management from 22 regional health care organizations completed the survey, representing 3,161 health care workers, or 80% or all health care staff. The survey was commissioned by the University of Alaska Southeast, University of Alaska Anchorage, Bartlett Regional Hospital, the Southeast Alaska Regional Health Consortium, and Alaska State Hospital and Nursing Home Association. The following page summarizes some of the survey's key findings.

Source: Southeast Alaska Health Care Workforce Analysis September 2019, Southeast Conference. **Photo credits:** Peter Metcalfe

Southeast Alaska Health Care **Workforce Analysis**

Best/Least Effective **Recruitment** Strategies

Southeast Alaska health care leaders were asked to rank the effectiveness of 16 recruitment strategies. This chart is a weighted ranking of their highest and lowest ranked tools.

The most effective recruitment tools for Southeast health care institutions include higher wages and providing flexible work arrangements.

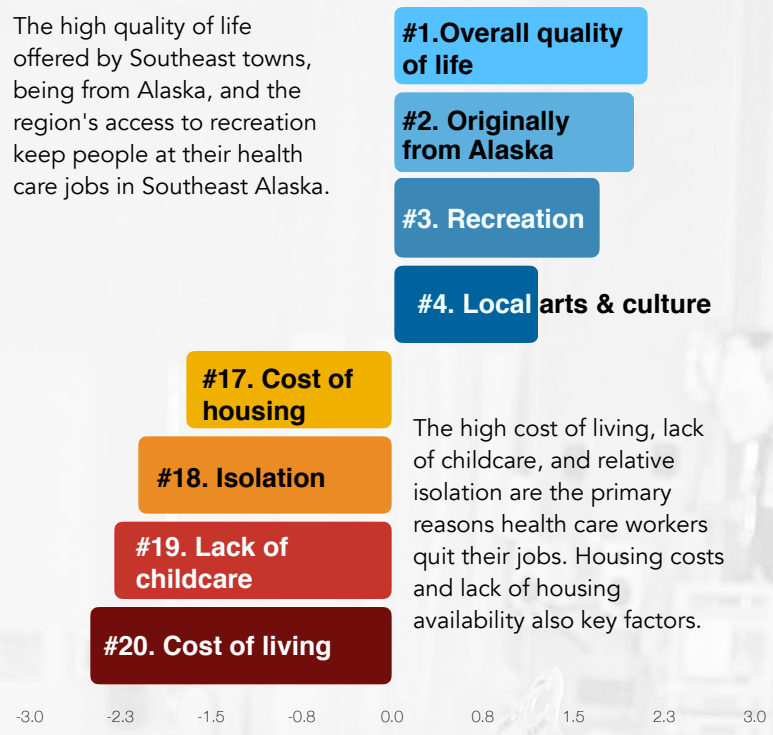
The least effective recruitment tool was use of job fairs.

Primary **Retention & Turnover** Factors

Health care leaders asked to rank the significance of 20 factors that result in long-term retention, or in staff turnover.

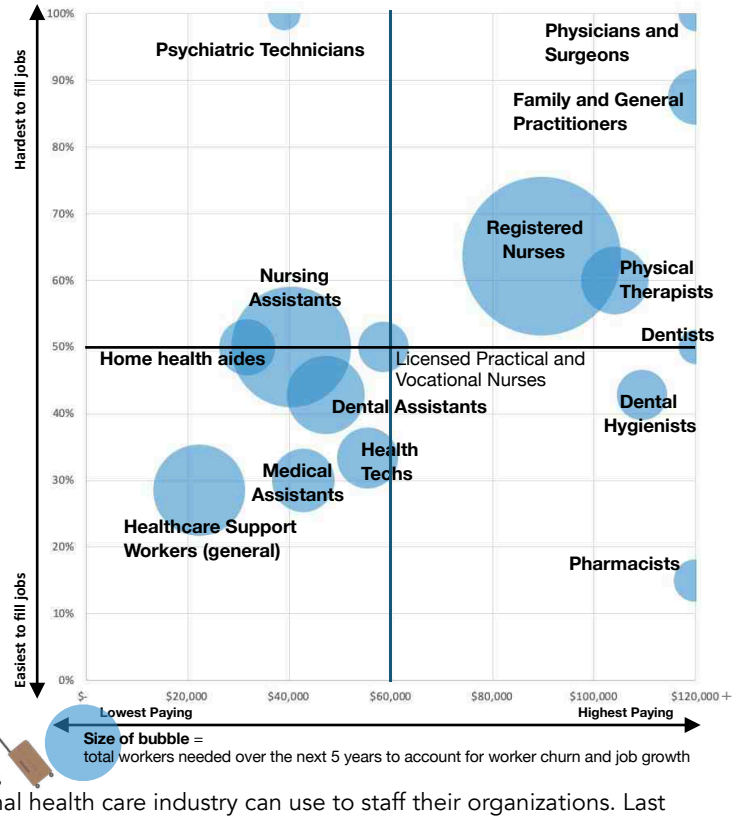
The high quality of life offered by Southeast towns, being from Alaska, and the region's access to recreation keep people at their health care jobs in Southeast Alaska.

The high cost of living, lack of childcare, and relative isolation are the primary reasons health care workers quit their jobs. Housing costs and lack of housing availability also key factors.



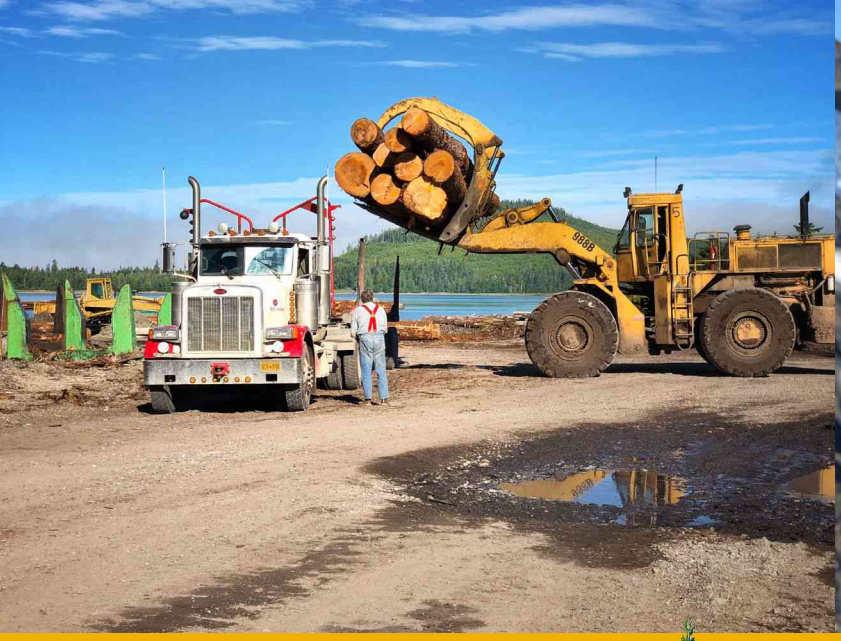
Workforce 5 Year Development Needs

This bubble chart cross-tabulates earnings, recruitment ease, and turnover, and compiles a single picture of the region's future health care workforce needs. It provides a visual blueprint as to where the most resources should be focused when attracting workers to the region, or for "growing our own" workforce. Registered nurses have the highest workforce development need. Last year, 824 registered nurses worked in the region, although the average quarterly worker count was 628, meaning there was significant worker churn in those positions. Moreover, it is hard to fill registered nurse jobs, 82% of health care organizations in the region say it is a difficult position to fill, including 64% who say it is very difficult. While the position is not growing as fast as others — the projected growth for this position is 5% in five years — combined growth and turnover rates mean that **an additional 543 registered nurses will be needed in the region over the next five years**, assuming nothing is done to stem the high rate of turnover. Nursing assistants will also be in high demand, with 312 new positions in need of filling by 2023. While physicians, surgeons, and psychiatric technicians are the hardest positions to fill, the total number of positions forecast to be in need of filling over the next five years is comparatively smaller at 49 combined positions.



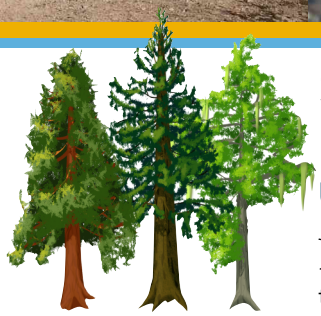
Traveling **Health Care Workers**

Use of traveling health care workers is another important tool that the regional health care industry can use to staff their organizations. Last year, nearly 350 traveling health care workers came to Southeast Alaska. Travelers are both positive and problematic for the Southeast Alaska health care industry. While each of those traveling health care workers represents additional capacity, they also represent additional costs. According to survey analysis, it costs 30% to 250% more to engage a traveling health care worker than it would be to hire a permanent employee, depending on the organization.



Southeast **Timber Industry** 337 Jobs

Down 17 Jobs in 2018
-5%



Regional timber jobs declined by 5% in 2018. The workforce is down to 337 jobs in 2018, with total earnings of $18.8 million. Most of the region's timber jobs are concentrated on Prince of Wales Island, which is home to Viking Lumber, the last remaining mid-sized sawmill in Southeast Alaska. Southeast timber jobs peaked at 3,543 annual average jobs in the 1990s.

In 2001, the Roadless Rule dramatically curtailed logging, roadbuilding, and mineral leasing in all national forests. The Tongass was temporarily exempted from the rule in 2003, but in 2011 that exception was overturned, further limiting access to regional timber stands. Maintaining a sufficient timber supply has been challenging. Even in parts of the Tongass where the rule does not apply, timber sales face regulatory and economic hurdles, and constant legal challenges.

In 2019, the USFS indicated that exempting the Tongass from the Roadless Rule could be the preferred alternative in the draft environmental impact statement to be issued in the fall. The final impact statement and record of decision will not be completed until late 2020 and will be subject to years of litigation. Removal of Roadless Rule restrictions could make more suitable timber land available for harvesting and increase forest-related employment. However, the Forest Service would still have to amend its 2016 management plan before new timber sales could be readied.

Currently, the regional timber supply remains low. A land exchange between the Mental Health Trust and the US Forest Service opened up areas for timber harvest in 2019, although ongoing process arguments have delayed phase 2 of that project, which could have a negative effect on the short-term regional timber supply.

The trade war is also impacting the timber sector. Spruce has been the subject of higher Chinese import tariffs, stalling sales in northern Southeast, where the forests are primarily spruce. The longer-term impact of the trade disputes remains unknown at this time.

Sources: ADOL 2018 Employment and Wage data; Kitco Metals Inc; Coeur Mining Inc. 2018 Annual Report; Hecla Mining Company 2018 Annual Report.
Photo credits: Bryce Dahlstrom, Viking Lumber and Constantine Metal Resources.

Southeast **Mining Industry** 889 Jobs

Up 3 Jobs in 2018

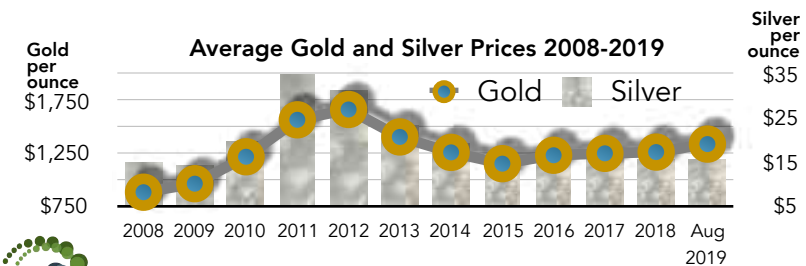
Mining industry employment in the region was flat in 2018, and is on track for 2019 to maintain a similar number of workers. In 2018, there were 889 annual average mining jobs in Southeast Alaska, with a payroll of $93 million. Two large mines operating in the region account for most (93%) of mining employment. In August 2019, Hecla Greens Creek employed 436 full-time permanent employees (+5 from 2018), while Coeur Alaska Kensington had a staff of 386 (-3 from 2018). Average annual wages of $104,650 in 2018 were up 2% from 2017. Mining jobs remain the highest-paying in the region, paying more than double the average regional wage of $50,002.

Hecla Greens Creek is one of the largest silver mines in the world, while the Coeur-owned Kensington is exclusively a gold mine. At Hecla Greens Creek production was mixed in 2018: silver production was down 5% to 8 million ounces, while zinc was up 5%, and gold production was up 1%. Production at Kensington was down 1%, with 113,778 ounces of gold produced in 2018. Zinc prices were up in 2018, and gold continues to rise incrementally.

Mineral exploration continues at the Palmer Zinc-Copper-Gold-Silver Project in Haines. Constantine received permits to construct an underground ramp (tunnel) for expanded exploration. The company recently released a positive Preliminary Economic Assessment, projecting an 11-year mine life with the current resources.

In September, the governor asked that Bokan Mountain, a rare earth element exploration project on Prince of Wales Island, be federally designated as a high priority infrastructure project.

The mining sector is expected to grow incrementally in 2019 and 2020, as it mitigates the impacts of new tariffs.



Construction Industry

1,909 Jobs

Down 23 Jobs in 2018 -1%

For the fifth year in a row construction employment is down, bringing employment to its lowest level since 1992. Jobs fell by 23 last year to 1,909, a combined loss of 360 jobs, or 16% decline, over five years and a $28 million corresponding drop in wages. Construction workers in the region earned $122 million in 2018 — or 5% of all Southeast Alaska employment earnings.

One positive indicator for the sector was that housing construction was up in 2018, as 13 more units were permitted or completed than in the year prior. A total of 188 new homes were permitted in 2018. However, home construction remains significantly down from previous years.

Construction Outlook

Visitor industry infrastructure needs have improved the outlook for construction in the region.

- Hoonah's Icy Strait Point is constructing a 500-foot floating dock in partnership with Norwegian Cruise Lines.
- Norwegian Cruise Lines also is exploring a partnership to build a private dock north of Ketchikan at Ward Cove.
- In Juneau, Norwegian recently bid $20 million to purchase 2.9 acres of waterfront land (known as the Subport) and the area is expected to be developed.
- In Ketchikan, the city is considering a $150 million reconfiguration of its existing cruise dock to accommodate cruise vessels exceeding 1,000 feet in length.
- In Juneau, construction is underway on the the public-private waterfront Archipelago project.
- The Central Council of the Tlingit and Haida Indian Tribes of Alaska is building a heritage park in Thane.

Early employment data indicate construction-related employment is finally growing again, and is projected to grow 3% in 2019.

Education

3,096 Jobs

Up 14 Jobs in 2018 +0%

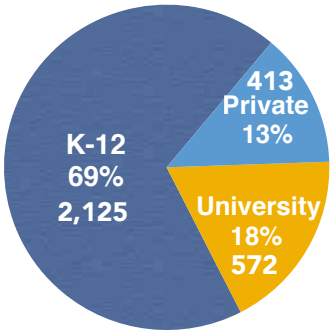
Education is a significant source of jobs in Southeast Alaska. With just over 3,000 average annual workers, the region's educators make up 7% of all regional jobs, and 6% of all regional wages. Teaching jobs provide a counterbalance to summer-centric industries like tourism, fishing, and construction jobs. Education jobs peak at 3,546 in the winter, and decline to just 1,264 positions in July. The average educator's wage in the region was $44,388 last year. Combined, educators earned $137.4 million in 2018.

Education jobs are primarily in the public sector, and 20% of all government jobs are in education. K-12 education is conducted by municipal governments, and comprise 69% of all education positions in the region, with 2,125 average annual workers in 2018, a number that has remained stable in recent years.

The university employed 558 workers in 2018, a decline of 15% compared to 2014, consistent with budget cuts that reduced funding to the University of Southeast Alaska by 13% over this period.

Private education jobs account for 13% of all education employment.

Distribution of 3,096 SE Education Jobs



School Enrollment

UAS enrollment was down by 4% from 2017 to 2,561 students in 2018. In 2018, the number of K-12 students dropped by 146 kids, to 11,334. Regionally, K-12 enrollment decreased for the 21st time in 23 years. Since 1997 annual enrollment shrank by more than 3,500 students, a 24% decline across Southeast Alaska.

Sources: Combination of Alaska Department of Labor 2018 Employment and Wage data and 2017 US Census Nonemployer (self-employment) Statistics; State of Alaska. Alaska Department of Education and Early Development; UA in Review. **Photography credit:** Rain Coast Data and UAS

GOVERNMENT

Government Jobs 2018
Local 5,266 Jobs **-84**
State 4,771 Jobs **-49**
Federal 2,111 Jobs **+1**
Tribal 999 Jobs **+24**

Government as a percentage of all Southeast Employment Earnings 2018

Government
13,148 Jobs

Down 108 Jobs in 2018 -1%

Government wages made up 34% of all regional employment earnings ($777 million) and 29% of the region's jobs (13,147) in 2018.

State Government Losses

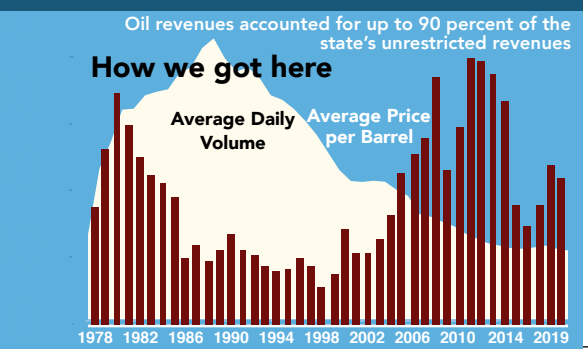
State government employment and spending have continued to decline, significantly impacting the regional economy. In Southeast Alaska, 12% of all direct wages come from the state (down from 15% in 2011). State jobs have declined for seven years in a row. Historically, oil paid for up to 90% of the state budget; today, oil covers about 30 percent. Total tourism wages are on track to surpass total state wages in 2019.

State Budget Challenge

Alaska is now only America's sixth-largest oil-producing state. Declining oil production and prices devastated the State of Alaska budget. The state has operated in deficit mode for the past six years, using more than $16 billion in savings to cover budget gaps.

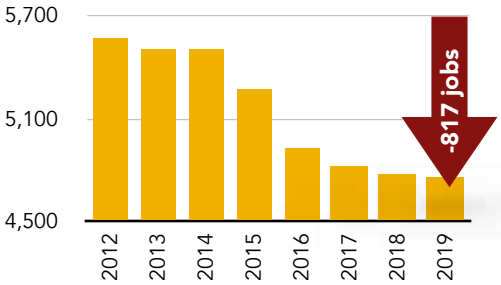
In February 2019, the governor proposed a plan to reign in spending by making $1.6 billion in cost reductions to the operating budget, with the bulk of the savings realized through cuts to ferries, health care, the University of Alaska, K-12 education, seniors, and creating a cost shift from the state to municipalities. Absent from the plan to balance the budget were reduced tax credits to oil companies ($1.2 billion in FY19); reduced Permanent Fund Dividend payments (a full PFD payment and repayment of previously capped dividends would cost $4.3 billion); or consideration of taxes. (See page 18 for budget survey results). The ensuing disagreement over how best to balance the budget, along with the controversial use of line item vetoes, has created an atmosphere of deep political and economic uncertainty in the region.

Avg. Daily Volume of the Trans Alaska Pipeline System and Inflation Adjusted Price Per Barrel, 1978-2019



Southeast State Jobs

State jobs in the region are down for the 7th year in a row, for a total of 817 jobs lost since 2012, ***a decline of 15%***



Federal Government

Federal government employment losses are compounding state job cuts, but appear to have stabilized. Since 2005, federal employment in the region has fallen by 600 jobs (28%) worth $50 million in annual wages.

Local Government

Local entities across the region are having to provide new programs and services the state has cut, resulting in financial complications and resulting in the loss of 84 municipal jobs across the region. Despite these challenges, local government jobs are poised to grow slightly in 2019. Tribal government, which includes 18 entities in the region, added 24 jobs in 2018.

Government Outlook

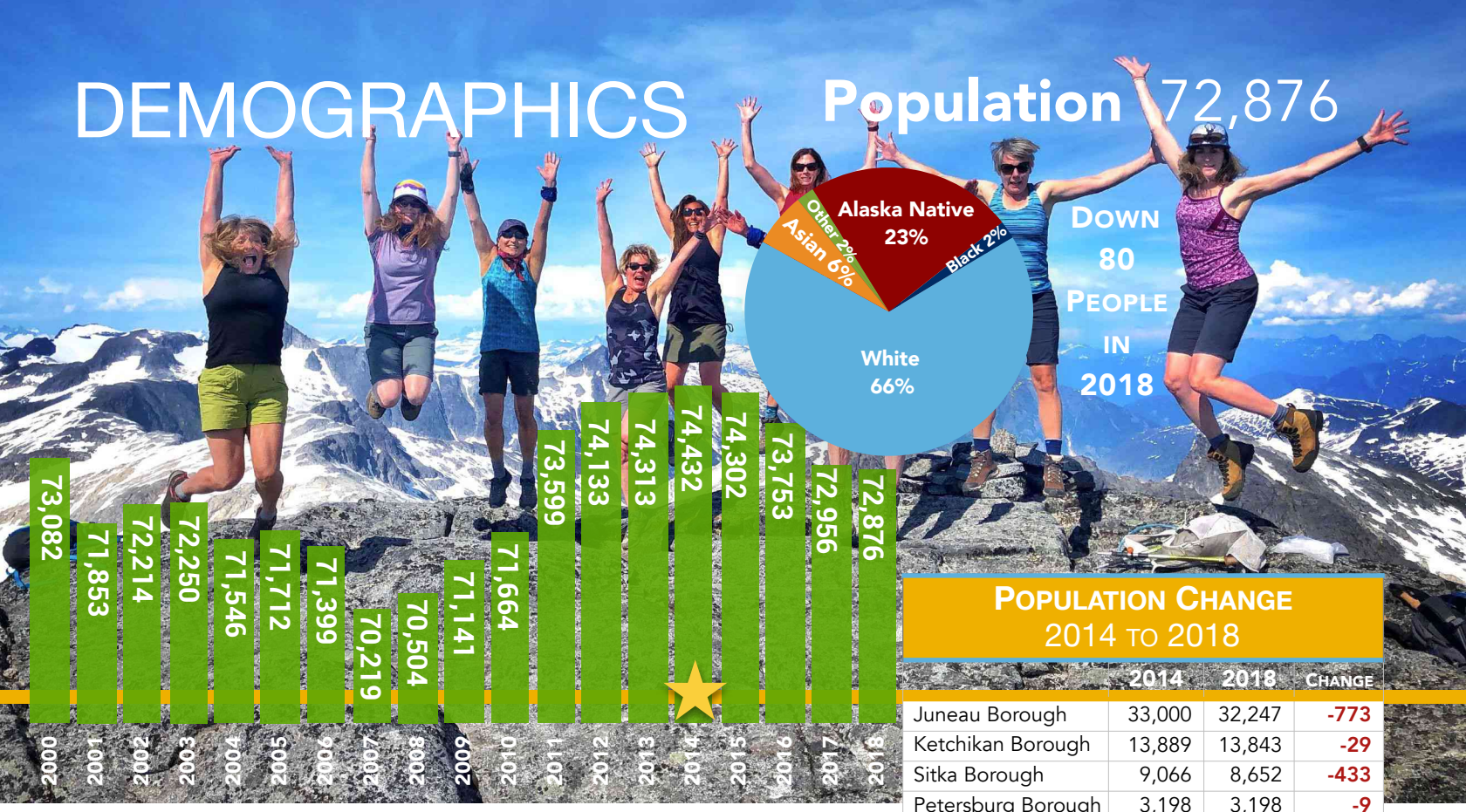
Early job reports from 2019 are somewhat positive. In the first half of 2019, only 14 additional state jobs were lost, local government jobs have grown by 2%, and federal jobs are up by 1% as well.

While legislation restructuring the $66 billion Alaska Permanent Fund passed in 2018, allowing lawmakers to use a portion of fund earnings to pay for state services and stabilize the state budget, these funds remain in limbo as the budget fight continues. The permanent fund is now more important to the budget than the oil industry, and all other taxes combined. But until a sustainable budget pathway is agreed upon and implemented, the region's economic outlook will remain uncertain.

Sources: ADOL 2018 Employment and Wage data; Alaska Department of Revenue. **Photo Credit:** Juneau Empire.

DEMOGRAPHICS

Population 72,876



2018 marked the 4th straight year of regional population decline in Southeast Alaska, but the net loss of 80 people was just a fraction of those seen in previous years. Half of the communities in the regions experienced gains in 2019, including the boroughs of Ketchikan, Petersburg, Haines, and Wrangell. In general, population losses last year were relatively small. While some communities on Prince of Wales Island, like Klawock and Coffman Cove, experienced dramatic population changes, the island population as a whole declined by 2%.

The leveling out of losses comes as relief to the region. Between 2014 and 2018, Southeast Alaska's population decreased by 1,642. The losses were region-wide, with six of eight boroughs reporting population declines. The boroughs of Skagway and Wrangell grew by 11% and less than one percent, respectively, during that period.

Juneau is the Loss Leader

Population losses were most significant in Juneau. Dramatic cuts in state employment contributed to a reduction of nearly 900 residents in the capital city over the past three years. Juneau's losses also abated in 2018, with a decline of just 55 people.

Migration

More people moved away from Southeast than moved here in 2018, but natural increases helped reduce the impact of outmigration. In 2018, there were 255 more births than deaths, while 335 more people moved out of the region than moved in.

Aging Continues

Since 2010, the most pronounced demographic shift has been aging of the population. During that period, the 60-plus population grew by 5,000 people, a 42% increase over 2010 due to aging in place. Nearly a quarter of people in the region are now age 60 or older. In Haines, Wrangell, and the Hoonah-Angoon census area, where the averages ages are 48.6, 48, and 46.8, respectively, it is nearly one-third. The average age of Southeast as a whole is 39.9. Juneau is comparatively the youngest community in the region.

Population Outlook

Population losses appear to have leveled out, but uncertainty regarding the state funding cuts makes it hard to project future changes. As long as the state continues to make fiscal reductions, these will continue to be paired with population declines.

Population Change 2014 to 2018

	2014	2018	Change
Juneau Borough	33,000	32,247	-773
Ketchikan Borough	13,889	13,843	-29
Sitka Borough	9,066	8,652	-433
Petersburg Borough	3,198	3,198	-9
Haines Borough	2,551	2,480	-70
Wrangell Borough	2,413	2,426	11
Metlakatla	1,446	1,398	-49
Craig	1,205	1,095	-112
Skagway Borough	1,038	1,088	109
Klawock	803	777	-28
Hoonah	786	789	1
Kake	627	601	-26
Yakutat Borough	623	523	-109
Gustavus	518	554	35
Thorne Bay	530	524	-8
Angoon	420	410	-10
Hydaburg	407	398	-9
Coffman Cove	175	168	-8
Tenakee Springs	129	144	17
Hollis	93	124	31
Naukati Bay	120	124	4
Klukwan	84	94	10
Hyder	91	80	-13
Kasaan	76	81	8
Pelican	77	68	-9
Port Alexander	45	55	10
Edna Bay	47	43	-4
Whale Pass	38	57	17
Port Protection	56	31	-24
Game Creek	18	18	0
Elfin Cove	16	12	-4
Point Baker	12	13	0
Remainder	835	761	-168
Total	**74,432**	**72,876**	**-1,642**

Sources: Alaska Department of Labor (ADOL); ADOL Southeast Alaska Population by Age, Sex and Borough/Census Area, 2010 to 2018; Alaska Population Projections.
Photography credit: Debbie Hart.

SOUTHEAST ALASKA REGIONAL OVERVIEW

Southeast Alaska Land Ownership

Circle size = Number of Acres

16% OTHER FEDERAL HOLDINGS MAKE UP NEARLY ALL THE REST (MOSTLY GLACIER BAY)

3.4% ALASKA NATIVE ORGANIZATIONS ARE THE REGION'S NEXT LARGEST LAND OWNER

2.5% STATE OF ALASKA LANDS INCLUDE THOSE MANAGED AS PART OF THE MENTAL HEALTH TRUST

0.25% MUNICIPAL LAND HOLDINGS

0.05% PRIVATE LAND OWNERS

THE REGION

The Southeast Alaska panhandle extends 500 miles along the coast from Metlakatla to Yakutat, encompassing approximately 33,500 square miles of land and water. The saltwater shoreline of Southeast Alaska totals approximately 18,500 miles. More than 1,000 islands make up 40 percent of the total land area. The region is home to 34 communities. The three largest communities—Juneau, Ketchikan, and Sitka—together are home to 75 percent of the regional population.

CULTURE

The dominant culture in the region is indigenous. Alaska Natives—the Tlingit, Haida, and Tsimshian—make up nearly a quarter (23%) of the region's population. The Tlingit have resided in the region for 11,000 years. The region's mild climate, abundant food and raw materials supported the development of highly organized and culturally advanced societies with extensive trade routes and rich artwork.

ECONOMIC TRENDS

Starting in the 1880s, the economy of Southeast Alaska experienced a century of growth that intensified after statehood in 1959. From statehood into the 1990s, population and employment levels in Southeast more than doubled as the workforce expanded in the areas of mining, government, fishing, tourism, and timber. In the beginning of the 1990's seafood and timber directly accounted for a fifth of the regional economy. However, over that next decade pulp mills and sawmills in the region closed, laying off 3,200 workers. During the same period, the value of salmon declined and catch levels fell. Total Southeast Alaska wages hit bottom in 1997. The population continued to decline through 2007. Between 2008 and 2015, the region experienced a significant economic recovery, rebounding to record numbers of jobs, wages, and residents. However, the state budget crisis and the loss of more than 800 State of Alaska jobs changed the economic trajectory of the region.

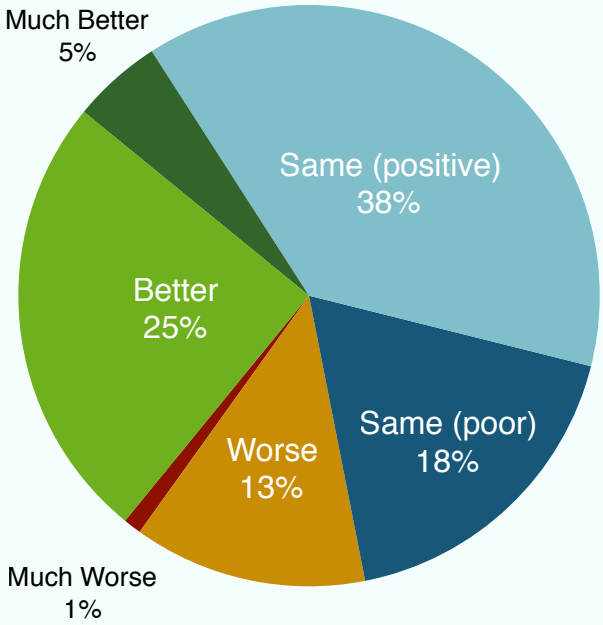
LAND OWNERSHIP

A lack of privately-owned land and land available for development is unique to Southeast Alaska and impacts the ability of the region to nurture the private sector. (See infographic on the left.) Southeast Alaska's land ownership is dominated by the federal government, which manages 94 percent of the land base. Most of this (78%, or 16.75 million acres) is the Tongass National Forest. The remaining federal lands are mostly in Glacier Bay National Park. The State manages 2.5 percent of the total land base (511,500 acres), including the Alaska Mental Health Trust Authority and University of Alaska lands. Boroughs and communities own 53,000 acres—a quarter of one percent of the regional land base. Alaska Native organizations, including village, urban, and regional corporations and the Annette Island Reservation, own 3.4 percent (728,100 acres) of the land base. Other private land holdings account for 0.05 percent of the land base. In 2017, communities received nearly $19 million in federal Payment In Lieu of Taxes and Secure Rural Schools funding to compensate for federal ownership of the regional land base.

Sources: Personal communications with State of Alaska; US Forest Service; Sealaska. *Economies in transition: An assessment of trends relevant to management of the Tongass National Forest, USDA 1998.* **Image Credits:** Misty Fjords Shutterstock image 68855041. Canoe by Annie Caufield. Background image carving by Mike Dangeli.

SOUTHEAST **ECONOMIC OUTLOOK** SURVEY

"What is the economic outlook for your business or industry over the next year (compared to the previous year)?"



Current Regional Business Climate Survey

In April of 2019, 320 Southeast Alaska business owners and top managers from 25 communities responded to Southeast Conference's Business Climate and Private Investment Survey.

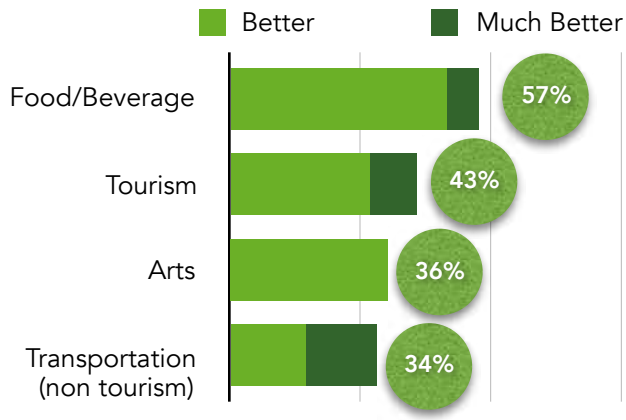
Southeast Alaska Economic Outlook

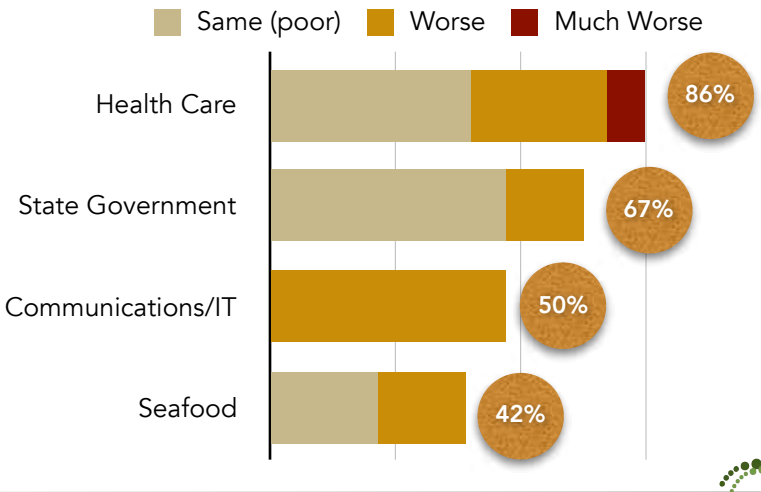
Southeast Alaska business leaders overall have a similar outlook looking forward that they did a year ago. More than half (56%) of survey respondents expect their prospects to remain status quo, 30% expect their prospects to improve in the coming year, and 14% expect decline. This represents a one percent increase in overall positive outlook over last year, but a three percent increase in those who feel the outlook is "much better" than it was the year before.

Businesses in Hoonah, Gustavus, and Skagway reported the outlooks that are most likely to improve — more than 50% of business leaders in each of those communities said that they expect the economic outlook to be better or much better in the next 12 month. Petersburg leaders reported the most deteriorating economic outlook. The food and beverage, and tourism industries reported the most improving outlooks by industry, with more than 40% of respondents foreseeing improvement. The least optimistic sector was the health care industry; 43% of respondents expect that industry to worsen.

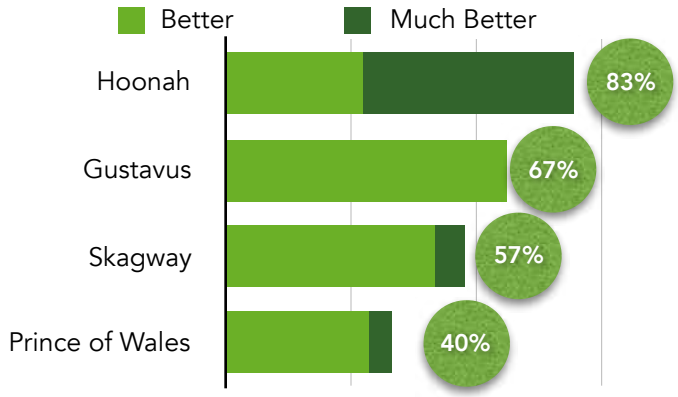
What is the economic outlook for your business or industry compared to last year?

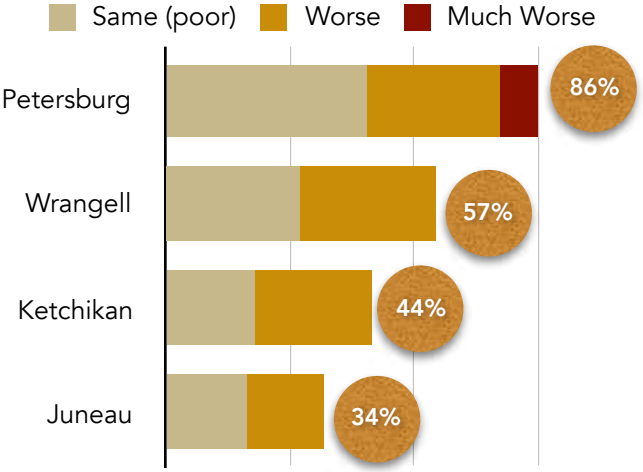
By Industry





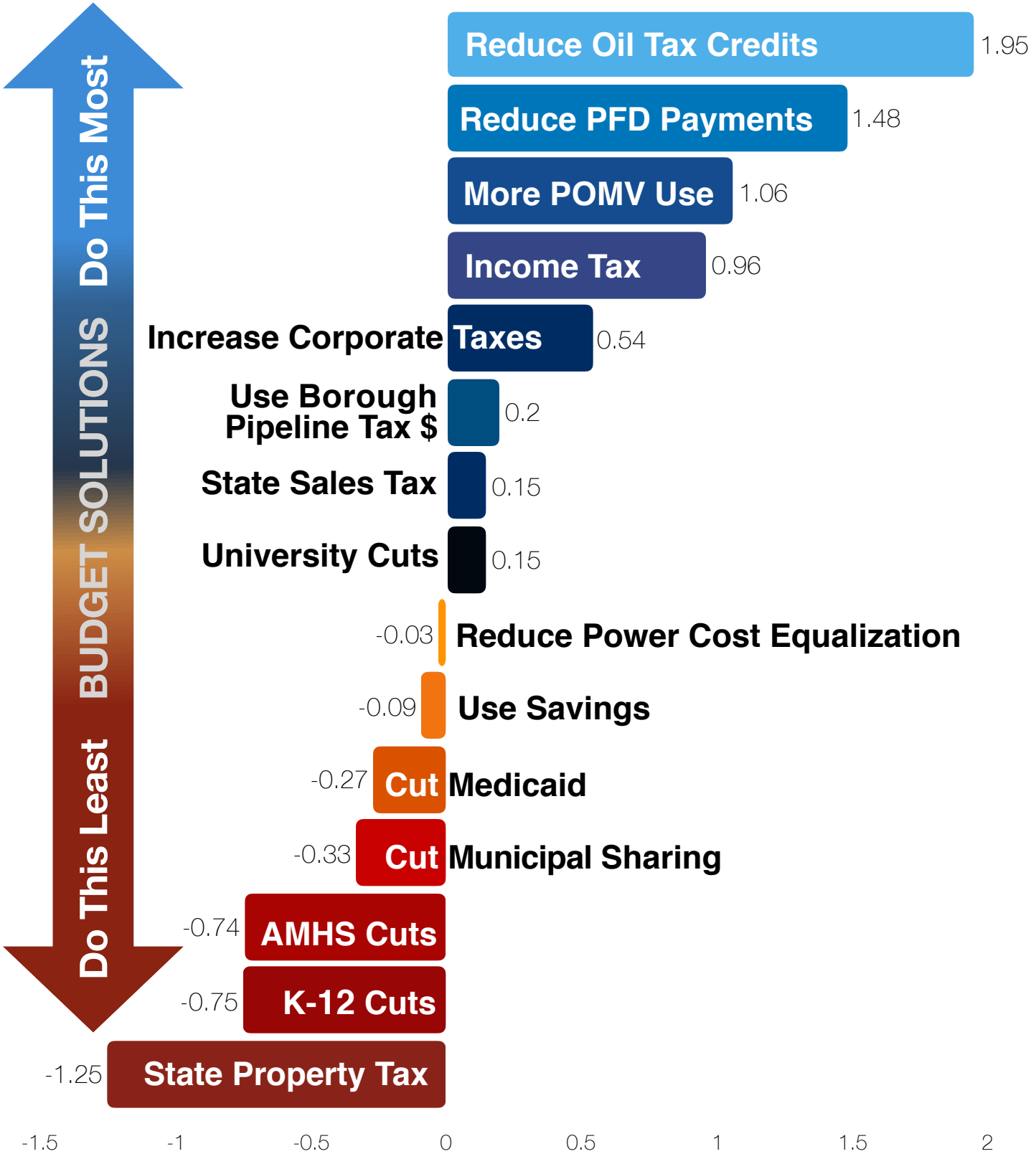
By Community





Southeast Businesses **Budget Findings**

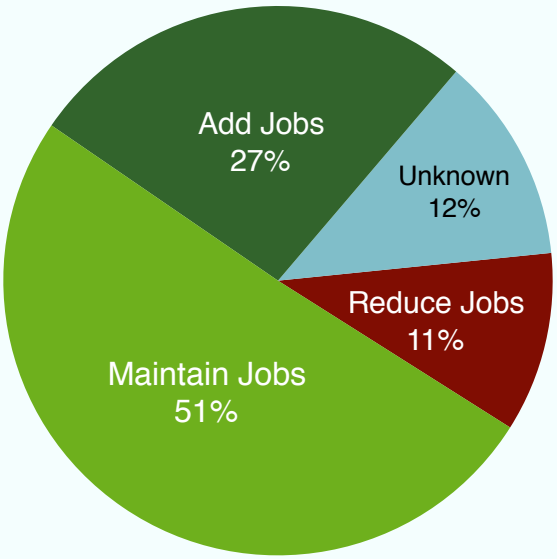
Southeast Conference asked **320** Southeast business owners and top managers in **25** regional communities how they would like to see the state achieve a balanced budget. This is an overall ranking of their responses.



Responses weighted by use preference

Adding **Jobs in 2019 and 2020**

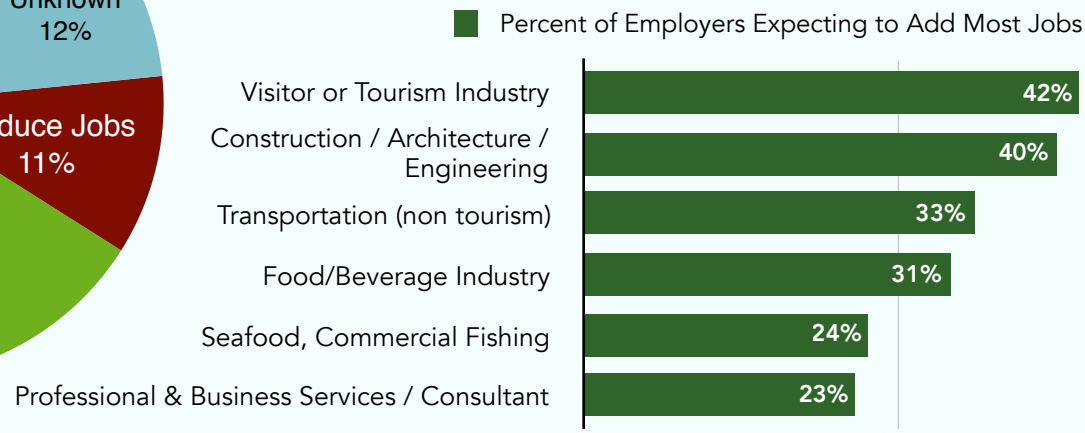
Over the next year, do you expect your organization to add jobs, maintain jobs, reduce jobs, or are you unsure?



Hiring in the next year

A new question added to the survey this year was regarding hiring expectations over the next year. More than a quarter of the 320 business leaders surveyed expect to add jobs to their businesses over the next 12 months, while 51% expect to maintain total jobs, and 11% expect to reduce total employees. The largest gains are expected in the visitor industry, where a staggering 42% of respondents expect to increase their total staff in the upcoming year. The arts, IT, financial, and real estate sectors project the smallest worker increases.

Analyzed by community, Skagway employers expect the most significant job gains. Juneau and Petersburg are the least likely to add jobs next year.



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Conservation Biology

Contributed Paper

Use of Historical Logging Patterns to Identify Disproportionately Logged Ecosystems within Temperate Rainforests of Southeastern Alaska

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Abstract: *The forests of southeastern Alaska remain largely intact and contain a substantial proportion of Earth's remaining old-growth temperate rainforest. Nonetheless, industrial-scale logging has occurred since the 1950s within a relatively narrow range of forest types that has never been quantified at a regional scale. We analyzed historical patterns of logging from 1954 through 2004 and compared the relative rates of change among forest types, landform associations, and biogeographic provinces. We found a consistent pattern of disproportionate logging at multiple scales, including large-tree stands and landscapes with contiguous productive old-growth forests. The highest rates of change were among landform associations and biogeographic provinces that originally contained the largest concentrations of productive old growth (i.e., timber volume >46.6 m^3/ha). Although only 11.9% of productive old-growth forests have been logged region wide, large-tree stands have been reduced by at least 28.1%, karst forests by 37%, and landscapes with the highest volume of contiguous old growth by 66.5%. Within some island biogeographic provinces, loss of rare forest types may place local viability of species dependent on old growth at risk of extirpation. Examination of historical patterns of change among ecological forest types can facilitate planning for conservation of biodiversity and sustainable use of forest resources.*

Keywords: forestry, fragmentation, land-cover change, old-growth forest

El Uso de Patrones Históricos de Tala para Identificar Ecosistemas Talados Desproporcionadamente en Bosques Lluviosos Templados del Sureste de Alaska Albert & Schoen 11-839

Resumen: *Los bosques del sureste de Alaska permanecen en su mayoría intactos y contienen una proporción sustancial de los bosques lluviosos templados maduros de la Tierra. Sin embargo la tala a escala industrial ha ocurrido desde los 1950s dentro de un rango relativamente estrecho de tipos de bosque que nunca se ha cuantificado en una escala regional. Analizamos los patrones históricos de tala de 1954 hasta 2004 y comparamos las tasas relativas de cambio entre tipos de bosque, asociaciones de formaciones terrestres y provincias biogeográficas. Encontramos un patrón consistente de tala desproporcionada en escalas múltiples, incluyendo grandes fragmentos y paisajes con bosques maduros productivos contiguos. Las tasas más altas de cambio estuvieron entre las asociaciones de formaciones terrestres y provincias biogeográficas que originalmente contenían la mayor concentración de bosque maduro productivo (p.ej.: volumen de madera >46.6 m^3/ha). Aunque solo 11.9% de los bosques maduros productivos han sido talados a lo largo de la región, los fragmentos se han reducido al menos en 28.1%, bosques de karst en 37%, y paisajes con el volumen más alto de bosque maduro contiguo en 66.5%. Dentro de algunas provincias biogeográficas aisladas, la pérdida de tipos raros de bosque puede ubicar la viabilidad local de especies dependientes del bosque maduro en riesgo de extirpación. Examinar los patrones históricos de cambio entre tipos de bosque ecológicos puede facilitar la planeación para la conservación de la biodiversidad y el uso sustentable de los recursos forestales.*

Palabras Clave: bosque maduro, cambio en cobertura de suelo, fragmentación, silvicultura

Paper submitted December 16, 2011; revised manuscript accepted August 17, 2012.

DOI: 10.1111/cobi.12109

Introduction

Assessment of threats to rare ecosystems has become an increasing focus for global conservation, and factors such as geographical distribution and changes to ecosystem composition, structure, and function have been used in such assessments (Nicholson et al. 2008; Rodriguez et al. 2010). We used historical patterns of logging to assess change among forest ecosystems within the coastal temperate rainforests of southeastern Alaska and specifically to assess how current forest conditions differ from historical conditions.

Coastal temperate rainforests are globally uncommon. The largest (35% of this ecosystem worldwide) is distributed along the Pacific coast of North America from northern California through southern coastal Alaska (Kellogg 1992; DellaSala et al. 2011:16). Although the southern half of the Pacific coast rainforest is heavily developed, northern British Columbia and southeastern Alaska retain the largest amount of intact old-growth temperate rainforest on Earth and support abundant populations of species that have declined or are threatened in the southern portion of their historical ranges (e.g., Pacific salmon [*Oncorhynchus* spp.], brown bear [*Ursus arctos*], and Marbled Murrelet [*Brachyramphus marmoratus*]) (DellaSala et al. 2011:57).

In southeast Alaska, where fire is rare, natural patterns of disturbance such as wind storms, landslides, and flooding produce a fine-scale patchwork of forest types and structure that differ substantially from the more homogenous, even-aged stands that develop after clearcut logging (Kramer et al. 2001; Ott & Juday 2002; Alaback et al. 2013). Old-growth forests typically occur in a mixed-age mosaic dominated by old trees (>300 years) and have multilayered canopies, abundant understory vegetation, and high structural diversity (Harris & Farr 1974; Kramer et al. 2001). In contrast, clearcut logging is a stand-replacing event that initiates succession (0–5 years, shrubs; 5–25 years young conifers; 25–30 years, conifers that prevent light from reaching the forest floor) (Alaback 1982). Twenty to 30 years after clearcutting (stem-exclusion phase), the forest is characterized by a homogeneous structure, low understory diversity and productivity, and relatively low habitat value for native fauna. This stage typically lasts >100 years (Wallmo & Schoen 1980; DellaSala et al. 1996). Although timber volume sufficient for commercial harvest may regenerate <100 years after logging (Harris & Farr 1974), the structure and diversity of old-growth forests require several centuries to develop (Alaback 1982; DellaSala et al. 2011:49).

Large-scale timber harvesting in the region developed, following passage of the 1947 Tongass Timber Act, within a framework of subsidized, long-term timber contracts (Beier et al. 2009). Later, harvest on private lands began under the 1971 Alaska Native Claims Settlement Act (Knapp 1992). Logging in the region peaked at 2.3 million m^3/year in 1990 and declined to approximately 0.4 million m^3/year in 2004 (USFS 2008*a*) as a result of combined political, economic, and institutional factors (Beier et al. 2009). Although the location and timing of past logging is known, the pattern of logging relative to the availability of forest types has not been analyzed at a regional scale to allow for evaluation of changes in diversity and abundance of forest ecosystems and determination of the potential implications for conservation of biodiversity (Lindenmayer et al. 2000) and timber supply (Beier 2010).

Our objectives were to document current forest conditions and historic patterns of logging; estimate the original distribution of ecosystems (ecological forest types) among biogeographic provinces; and map the distribution of old-growth ecosystems that have sustained disproportionate rates of logging in the past. Uniquely, we documented in a spatially explicit manner how southeastern Alaska forests have changed as a result of logging and how the present landscape differs from historical conditions. Although researchers have evaluated change in condition of old-growth forests over time in areas farther south in the Pacific Northwest (Staus et al. 2002; Wimberly & Ohmann 2004), few have provided a sufficiently fine-grained characterization of ecological systems to identify changes in rare forest types (Strittholt et al. 2006) or specifically investigated ecological correlates of anthropogenic change (Alig et al. 2005). Recent (60 years) patterns of old-growth logging in southeastern Alaska can provide a model for understanding other temperate rainforest regions that were less well documented and now reflect a more complex mosaic of human development (Huston 2005).

Methods

Study Area

Southeastern Alaska extends approximately 800 km between Dixon Entrance (55°N, 130°W) and Yakutat Bay (59°N, 140°W) and is dominated by the Alexander Archipelago, which has >5000 islands and a total land area of 8.7 million ha (Fig. 1). Approximately 80% of the region is contained within the Tongass National Forest (6.8 million ha). Our study area was in the perhumid rainforest zone, which is characterized by a maritime climate with cool summers (<15 °C), abundant precipitation (200–600 cm), and mild winters (rarely < −10 °C) (Alaback 1996). Although the region is characterized as a rainforest, a large proportion of the landscape is wetlands, alpine tundra, and recently glaciated terrain (Nowacki et al. 2001).

Closed-canopy conifer forests are widely distributed below 600 m and are typically dominated by associations of western hemlock (*Tsuga heterophylla*), Sitka spruce

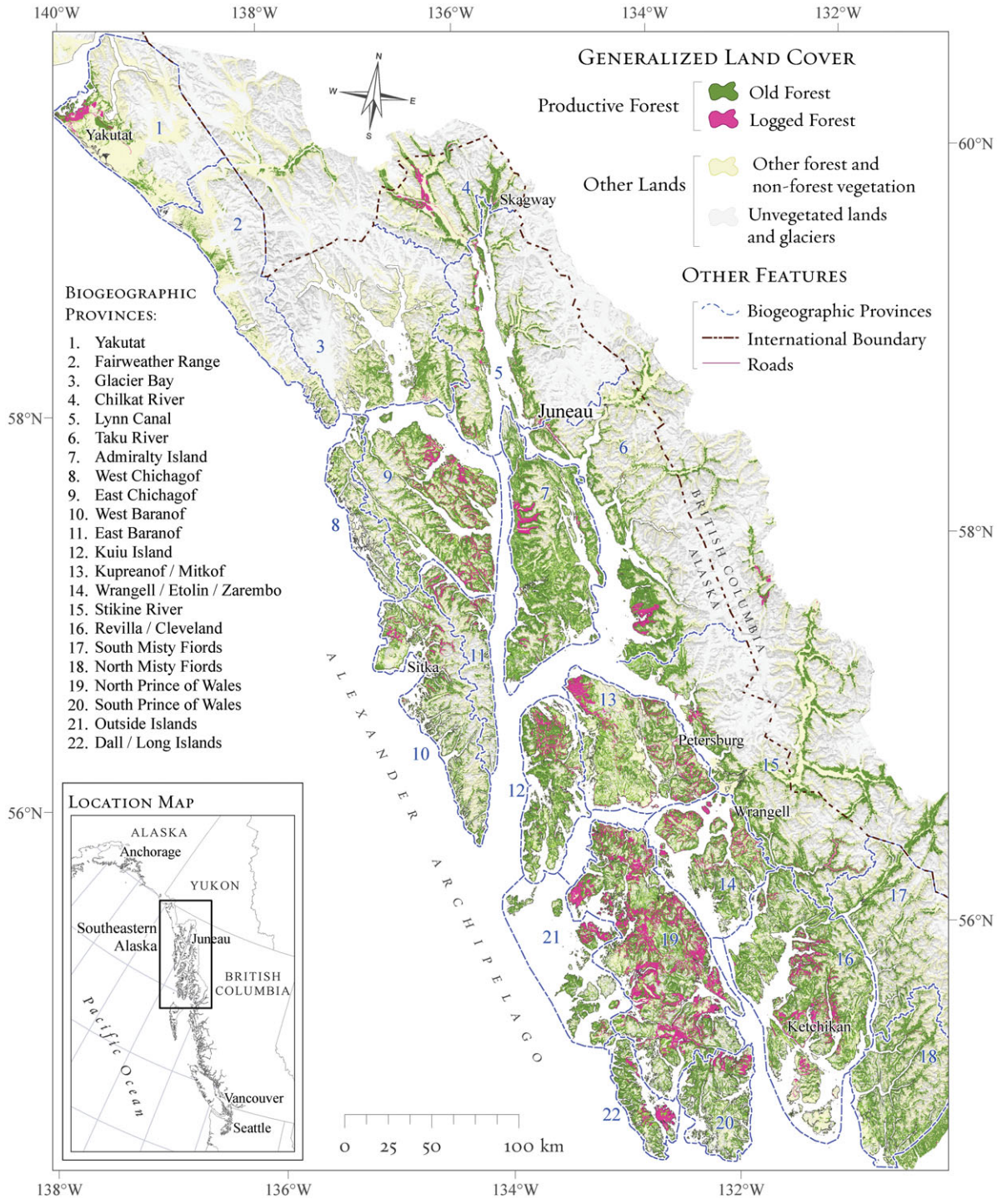

Figure 1. Generalized land cover and productive forest lands among biogeographic provinces in southeastern Alaska.

(*Picea sitchensis*), western redcedar (*Thuja plicata*), and Alaska yellow-cedar (*Chamaecyparis nootkatensis*) (Viereck et al. 1992). In general, large-tree (mean diameter >53 cm), old-growth forests are patchily distributed and tend to occur most frequently on well-drained sites, including lower elevation slopes, alluvial fans, and floodplains (Shephard et al. 1999) and on karst (i.e., porous limestone) substrates (Baichtal & Swanston 1996). We defined forest ecosystems on the basis of landforms and forest structural characteristics that correlate with important ecological processes, such as soil productivity and frequency of disturbance, species composition, and habitat value for native flora and fauna (Shephard et al. 1999; Caouette & DeGayner 2008).

Mapping of Forest Ecological Systems

To characterize forest types, we combined data on vegetation and landform associations to identify ecologically important distinctions not represented by vegetation mapping alone (Comer et al. 2003). Forest productivity is determined largely by soil characteristics and climatic gradients (Nowacki et al. 2001; USFS 2008*b*), and we followed the U.S. Forest Service (USFS 2008*a*) definition of forest productivity: a "productive forest" is land capable of producing >1.4 m^3/ha of wood fiber/year or with standing volume of timber >46.6 m^3/ha. Although not strictly a measure of net primary productivity, we assumed that given the region's low rate of forest disturbance under historical conditions (Alaback 1996; Kramer et al. 2001), characteristics of existing old-growth forest provided an index of site potential adequate for broad-scale comparison of forest productivity among landforms and biogeographic provinces (USFS 2008*b*).

Our primary source for mapping vegetation was the USFS (2008) Tongass timber inventory, which was completed in 1986. The inventory consisted of extensive ground surveys and aerial photography and periodic updates to reflect ongoing management. Productive old-growth forests are categorized by average tree size (Caouette & DeGayner 2005) and volume of standing timber. On the basis of mean diameter, productive old-growth forests are categorized as large-tree (>53 cm), medium-tree (43–53 cm), and small-tree (<43 cm) stands. Caouette and DeGayner (2008) report accuracy of 60–80% between this inventory and ground-based stand exams. Although characterization by tree size and timber volume differs from a typical forest classification that is based on species composition (e.g., Viereck et al. 1992), it is a useful indicator of structural gradients (Caouette & DeGayner 2008) that represents an important aspect of forest diversity (Noss 1990) and habitat functions for wildlife species (e.g., Schoen & Kirchhoff 1990; Iverson et al. 1996).

To map forests on lands outside the Tongass, we merged the timber inventory from the Haines State Forest (HSF) (ADNR 1985) and the Interim Land Cover Classification (ILC) (Shasby & Carneggie 1986). The HSF inventory categorizes stands on the basis of tree size, similar to the Tongass inventory. The ILC category "closed-canopy conifer" is roughly equivalent to the medium-tree old-growth category (i.e., middle 74%) of the Tongass inventory. Other ILC categories did not meet criteria for productive old growth and were excluded from further analyses. Following Caouette and DeGayner (2005), we categorized small-tree stands on hydric soils as low-volume strata, small-tree stands on nonhydric soils and medium-tree stands on hydric soils as medium volume, and all large-tree and medium-tree stands on nonhydric soils as high-volume strata (USFS 2008*a*). We used the National Wetlands Inventory (Cowardin et al. 1979) to identify hydric soils and calculated estimates of gross timber volume as a function of volume strata and geographic area (USFS 2008*a*). We digitized more recent road construction and logging activity outside the Tongass through visual interpretation of aerial photography (current in 1997) and Landsat Enhanced Thematic Mapper (ETM) imagery (current in 2000–2002).

To characterize forest conditions over a landscape matrix rather than as individual stands (Wiens 1995), we developed an index of old-growth forest density. We based the index on a moving-window analysis of gross volume within a 0.9-km radius (1.56 km^2). This index integrated information on forest structure and the degree to which productive old-growth forests are contiguous across this landscape.

Our sources for mapping landform associations were the Tongass Soils Inventory, derived from aerial photography and ground surveys (USFS 1996), and Karst Inventory, derived from field surveys and U.S. Geological Survey data on bedrock geology (Baichtal & Swanston 1996). We categorized landform associations as coastal (marine deposits and wave-cut terraces uplifted by tectonic or isostatic forces), lowland (glacial till and outwash, low topographic relief, extensive wetlands), valley floor (glacially carved U-shaped valleys with alluvial and glacial deposits), hills (rolling terrain, heavily scoured by glaciers), mountain slopes (low-to-mid slopes of mountain features, angular terrain, carved by glaciers, alluvial, and colluvial deposits), mountain summits (higher elevation, angular terrain), and volcanic (postglacial, volcanic terrain). A detailed description of landforms and the interacting effects of geology, landform, and hydrology on vegetation in this area is available in Nowacki et al. (2001). For areas lacking data on landform association, we used a supervised classification of topographic features (elevation, slope, and topographic position index) and the Tongass Soils Inventory as the training set (Hengl & Rossiter 2003). Overall agreement of this model with the soils inventory was 68%. Because karst was relatively rare, we merged all landform associations in areas of karst to preserve sufficient sample size for analyses.

To analyze the geographic distribution of forests and logging activity, we used biogeographic provinces (USFS 2008*a*) that represent ecologically important patterns of climate, glacial history, and island biogeography (Nowacki et al. 2001; Cook et al. 2006). The resulting maps of forest condition and landform associations were evaluated and considered robust by biologists and foresters with knowledge of local areas. All mapping was conducted with ArcInfo (version 9.2, Environmental Systems Research Institute, Redlands California).

Assessment of Forest Change

Data on the original composition of logged stands were available for 98,023 ha within the Tongass that were

logged after 1986. We assumed the proportional rates of logging within this sample among large- (29.3%), medium- (64.6%), and small- (6.1%) tree stands were representative of all logging that occurred from 1954 to 2004. To estimate historical timber volume, we assumed the distribution of hydric soils was a suitable variable to discriminate between medium-volume (i.e., hydric soils) and high-volume stands (i.e., nonhydric) (USFS 2008*a*). These assumptions are conservative and supported by anecdotal evidence that earlier logging (before 1979) was skewed more toward large-tree and high-volume stands than logging that occurred after 1986 (Rakestraw 1981; USFS 2008*a*). We used this information to compare average density of landscape forest and patch characteristics among the forest landscapes with the highest volume of forest (>18,762 m^3/km^2) between 1954 and 2004.

We determined patterns of selectivity in logging by comparing forest types selected for logging with their original availability (Alldredge et al. 1998). We evaluated selectivity among stand characteristics (tree size and timber volume), landscape-scale forest (timber volume per square kilometer), elevation (m), categories of landform associations and biogeographic provinces (percent productive forest). We used chi-square tests for categorical variables and Kruskal–Wallis for continuous variables (Conover 1980) to test for significance. We examined the correlation between rate of logging and forest productivity (as indexed by the percentage of land in productive forest) among biogeographic provinces and landform associations with Spearman's rank correlation (Conover 1980) and logistic regression (Hosmer & Lemeshow 1989).

Logistic-Regression Model of Forest Change

We developed a multiple logistic-regression model to identify the suite of forest variables most strongly predictive of whether forests had been logged or not logged and to map this relation within remaining old growth. To control for spatial autocorrelation at a regional scale, we explicitly included differences among biogeographic provinces as a potential explanatory variable in the logistic model. At the local scale, we spaced sample locations on a systematic grid at 1-km intervals and eliminated duplicate points that fell within any single forest stand. Each observation was coded as logged (1) or not logged (0) for the logistic model. We excluded federally protected lands from the logistic analyses.

Comparing all combinations of independent variables, we identified the best model with the Akaike information criterion (Hosmer & Lemeshow 1989) in STATISTICA software (StatSoft, Tulsa, Oklahoma). To account for an inadequate sample of logging within some biogeographic provinces, we grouped provinces of Admiralty Island with Chichagof Island; Glacier Bay and Fairweather provinces with Lynn Canal; and Misty Fiords with the Stikine River mainland (Fig. 1). We used the area under receiver operating characteristics (ROC) curve and percentage of observations correctly classified to evaluate the model (Guénette & Villard 2005). We interpreted the model by evaluating the significance of independent variables and the odds ratios (Hosmer & Lemeshow 1989).

We mapped the output of the logistic model as an index of selectivity that reflects the degree to which any combination of geographic, forest, and environmental variables were either preferentially selected or avoided for logging. For the purpose of calibrating the model to observed forest conditions, we determined the cut point that provided maximum accuracy in differentiating logged and old-growth stands (Guénette & Villard 2005). We used this criterion to estimate the remaining distribution of old-growth forest types that had sustained disproportionate rates of logging.

Results

Mapping of Forest Ecological Systems

Forested lands covered 4,488,848 ha in southeastern Alaska, approximately 50% of the total land base. Productive forests (including old-growth and younger stands) covered 2,657,154 ha, approximately 30% of the region's land base. Among landform associations, the proportion of land in productive forest was highest on karst (67%), followed by coastal areas (53%), hills (53%), mountain slopes (50%), valley floors (43%), volcanoes (31%), lowlands (31%), and mountain summits (2%).

Within productive old growth in 2004 (2,320,088 ha), large-tree stands represented 10.2%, whereas medium-tree stands represented 74.7% and small-tree stands represented 15.1% of the total (Table 1). Average timber volume among old-growth stands was 194.9 m^3/ ha (SD 46.4, range = 37–263), and at a landscape scale average volume was 4,330 m^3/km^2 (SD 5,029, range = 0–25,770). As a measure of availability, productive old-growth forests were most abundant on mountain slopes (58.7%), followed by lowlands (12.5%), valley floors (10.4%), hills (10.1%), and karst (4.1%). Among biogeographic provinces, North Prince of Wales had the largest proportion of all productive old growth (10.9%), followed by Admiralty Island (10.5%), Revillagigedo Island and Cleveland Peninsula (10.0%), and East Chichagof Island (7.6%). The remaining 16 provinces contained ≤6.2% of productive old growth each (Table 1).

Assessment of Forest Change

Although a large majority of productive forests in 2004 were old-growth forests (88.1%), the relative rate of logging differed among forest types and biogeographic provinces (Table 1). Large-tree stands were logged

Table 1. Distribution and condition of productive forest lands and the relative rate of logging among categories of tree size, landform association, and biogeographic province in southeastern Alaska.

	Productive forest lands					
	old forest		*logged forest*			
Variable	*(ha)*	*(%)*	*(ha)*	*(%)*	*Logged (%)*[a]	*Relative proportion logged*[b]
Tree size						
large	237,591	10.2	92,900[c]	29.3	28.1	2.36
medium	1,748,187	74.7	204,825[c]	64.6	10.5	0.88
small	354,310	15.1	19,341[c]	6.1	5.2	0.43
Landform						
Karst	95,596	4.1	56,217	17.7	37.0	3.11
valley floor	242,429	10.4	45,521	14.4	15.8	1.33
Coastal	36,576	1.6	5138	1.6	12.3	1.04
Hills	235,914	10.1	28,391	9	10.7	0.90
mountain slopes	1,373,992	58.7	149,879	47.3	9.8	0.83
Lowlands	293,484	12.5	30,681	9.7	9.5	0.80
Volcanic	6,571	0.3	521	0.2	7.3	0.62
mountain summits	55,526	2.4	718	0.2	1.3	0.11
Biogeographic province						
North Prince of Wales	255,884	10.9	119,699	37.8	31.9	2.68
Dall and Long Islands	44,056	1.9	10,880	3.4	19.8	1.66
Yakutat Forelands	33,525	1.4	7402	2.3	18.1	1.52
Kupreanof and Mitkof	144,764	6.2	27,364	8.6	15.9	1.34
Wrangell, Etolin, and Zarembo	93,341	4	16,713	5.3	15.2	1.28
East Chichagof	177,353	7.6	28,928	9.1	14.0	1.18
Outside Islands	47,951	2	7448	2.3	13.4	1.13
East Baranof	36,952	1.6	5,583	1.8	13.1	1.10
Chilkat River Complex	56,064	2.4	8,069	2.5	12.6	1.06
Revilla Island and Cleveland Peninsula	234,832	10	29,476	9.3	11.2	0.94
South Prince of Wales	68,218	2.9	7,236	2.3	9.6	0.81
Kuiu Island	117,705	5	12,007	3.8	9.3	0.78
West Baranof	95,561	4.1	7,869	2.5	7.6	0.64
Taku River	139,349	6	8,717	2.7	5.9	0.49
Stikine River	135,547	5.8	6,083	1.9	4.3	0.36
Admiralty Island	245,417	10.5	10,968	3.5	4.3	0.36
Lynn Canal	85,929	3.7	2,542	0.8	2.9	0.24
Glacier Bay	61,880	2.6	81	0	0.1	0.01
South Misty Fiords	128,030	5.5	0	0	0	0
North Misty Fiords	87,883	3.8	0	0	0	0
West Chichagof	30,107	1.3	0	0	0	0
Fairweather Icefields	19,741	0.8	0	0	0	0
All productive forest	2,340,088	100	317,066	100	11.9	1.0

[a] *Percent original availability.*
[b] *Ratio of percentage change within each category to the average change for all forest types (11.9%).*
[c] *Estimated by extrapolating the observed rates of logging from 1986 to 2004 (n = 98,023 ha) of large (29.3%), medium (64.6%), and small trees (6.1%) in all forest lands logged (n = 317,066 ha).*

2.4 times more than their relative availability, whereas medium-tree and small-tree stands were logged less than their availability (Table 1). Logging also occurred disproportionately at broader spatial scales. Logging was significantly higher in productive forests that were contiguous at a landscape scale (Wald $\chi^2 = 2910$, 1 df, $p < 0.0001$) and in the most productive landforms (Spearman's $R = 0.48$, $p = 0.02$) and biogeographic provinces, such as North Prince of Wales ($R = 0.802, p = 0.01$) (Fig. 2), than in noncontiguous forests and provinces and landforms with less productive forest lands.

As a result of selective patterns of logging, characteristics of remaining old-growth forests differed from forest types that occurred historically. Average landscape volume of old-growth forest declined region-wide by 16.8% from 1954 ($\bar{X} = 11{,}958$ [SD 5,009]) to 2004 ($\bar{X} = 9{,}941$ [SD 4,666]; $Z = 81.65$, $n = 26{,}538$, $p < 0.01$). This trend reflects a process by which large, contiguous old-growth landscapes were fragmented and interspersed with young growth and the remaining old-growth stands contain a smaller proportion of large trees than historically. The highest volume landscape forests in 1954 (>18,762 m^3/km^2) were reduced by 66.5% region-wide from 243,373 ha in 1954 to 81,611 ha in 2004. This reduction was accompanied by similar declines in the number of patches (1954 $n = 2{,}464$; 2004 $n = 1{,}660$), average

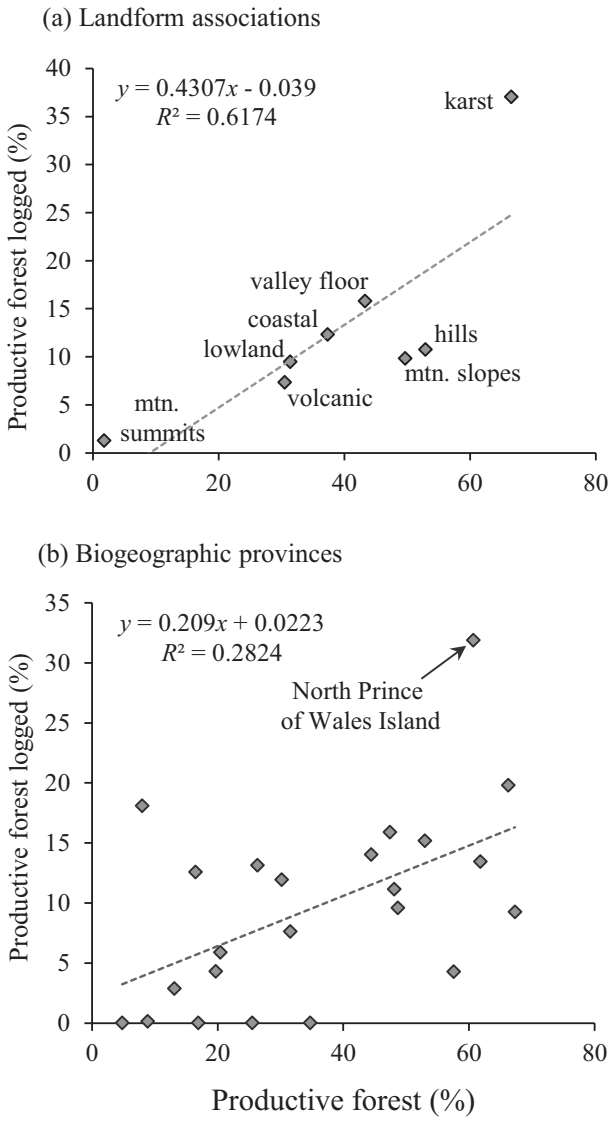

Figure 2. Percentage of lands in productive forest relative to percentage of those forests logged among (a) landform associations and (b) biogeographic provinces.

patch size (1954 $\bar{X} = 169$ ha [SD 848.4]; 2004 $\bar{X} = 105$ ha [SD 403]), and largest patch size (1954 max = 19,434; 2004 max = 9,433 ha). Due to natural fragmentation, high-volume forests contiguous at a landscape scale were always rare. The largest proportion (31%) of contiguous high-volume forest occurred on northern Prince of Wales Island, where such forests have been reduced by 93.8% (77,536 ha in 1954 to 4,801 ha in 2004) (Fig. 3) and average patch size declined from 264 ha in 1954 (SD 1,186.5) ($n = 435$, max = 11,692) to 73 ha in 2004 (SD 176.6) ($n = 164$, max = 1,321).

Logistic-Regression Model of Forest Change

With the exclusion of federally protected lands, the logistic-regression analyses included 1,727,483 ha, or 73.8%, of all productive forest lands in the region. The logistic model identified 4 variables that provided the best discrimination between logged and unlogged sites ($G = 4{,}438.58$, 18 df, $p < 0.0001$) (Table 2). The most significant predictor variable was landscape forest (Wald $\chi^2 = 1175.5$, 1 df, $p < 0.0001$), followed by biogeographic province ($\chi^2 = 614$, 15 df, $p < 0.0001$), stand volume ($\chi^2 = 499.5$, 1 df, $p < 0.0001$), and elevation ($\chi^2 = 479.2$, 1 df, $p < 0.0001$). Due to inadequate sample size, landform was not included in the final model. The goodness-of-fit chi-square test indicated the logistic model was apt ($p = 0.95$). The ROC indicated a good fit to the observed data (AUC = 0.859) and an optimal cut point of $p = 0.18$ to differentiate between logged and unlogged stands in the logistic model.

Regression coefficients showed that with other factors held constant, landscapes with higher forest density, stands with higher volumes of timber, and those located at lower elevations had higher rates of logging, whereas more sparsely distributed forests, lower volume stands, and those at higher elevations were logged at lower rates (Table 2). Although the highest proportion of all productive forests logged during this period was on North Prince of Wales (Table 1), the logistic model indicated that with other factors held constant, the relative rate of logging on East Baranof Island was similar to that on North Prince of Wales, both of which were 2.34 times greater than the regional average (Table 2).

With a cut point of 0.18 the logistic model correctly classified 75.8% of productive forest as either logged or unlogged. Forest types most commonly selected for logging, such as high-volume contiguous forests at lower elevations ($p \geq 0.18$), accounted for 34.6% (597,052 ha) of all productive forest, had sustained rates of logging 3.43 times greater than average, and consequently had a relatively high proportion of area in second growth (40.8%). In contrast, forest types not typically selected for logging such as lower volume fragmented forests and those at higher elevations ($p < 0.18$) represented 65.4% (1,130,386 ha) of all productive forest lands, sustained less than the average rate of logging (0.48-times), and remained largely in old-growth condition (94.3%).

Discussion

Although only a small fraction of all old-growth forests in southeastern Alaska have been logged (11.9%), the systematic way the most productive stands and landscapes have been targeted indicates that the likelihood of maintaining the natural abundance of forest types, including important fish and wildlife habitat, may be lower than this percentage suggests. Landscape-scale blocks of productive forest, stands of larger trees, and forests at lower elevations were disproportionately targeted for logging, and rate of logging was positively correlated with broad-scale forest productivity among landforms and biogeographic

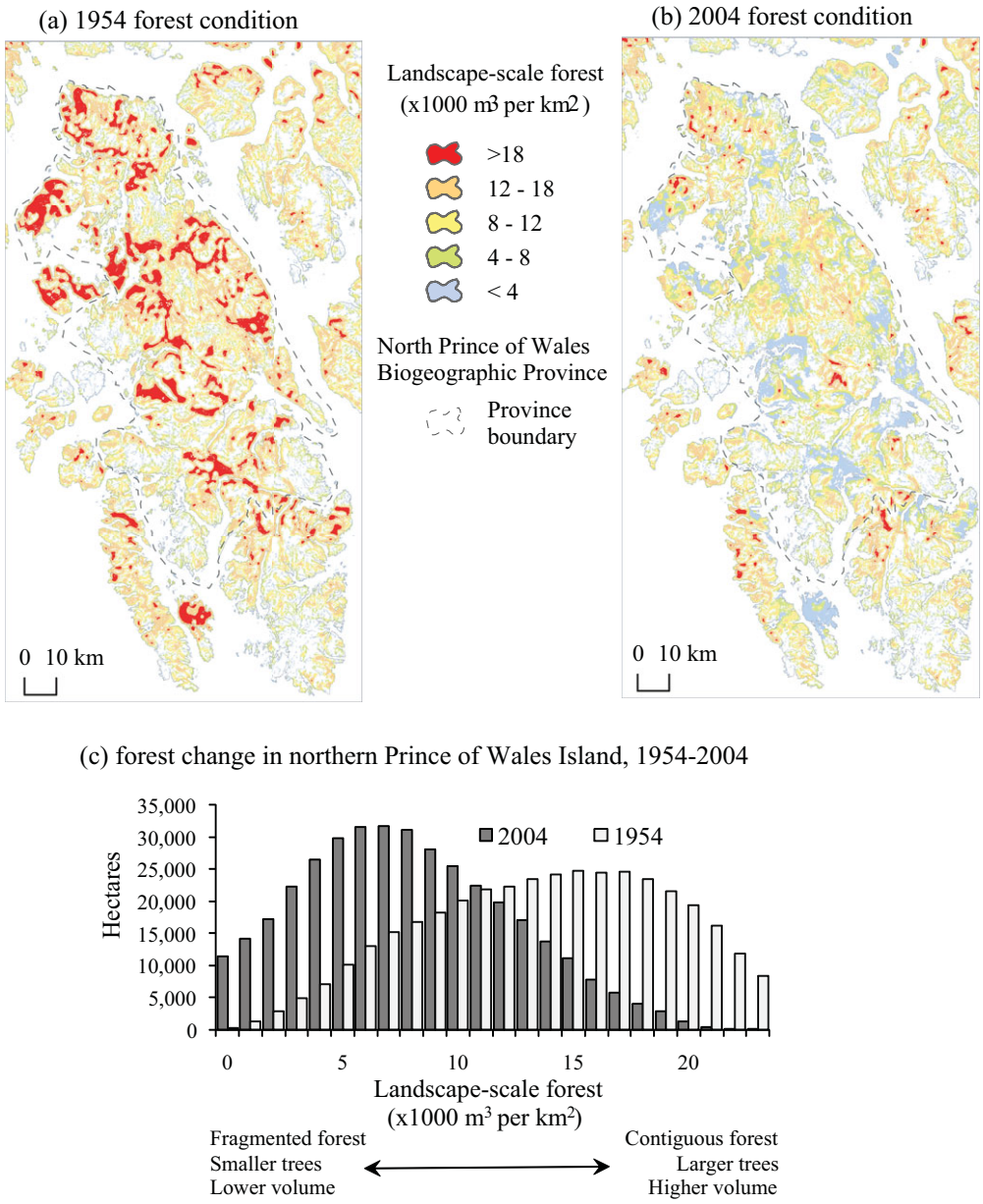

Figure 3. Change in the landscape-scale distribution of productive (i.e., timber volume >46.6 m^3/ha) old-growth forest in southeastern Alaska from (a) 1954 to (b) 2004 and (c) change in availability of remaining old-growth forests in the North Prince of Wales biogeographic province.

provinces. This spatial correlation of logging to forest productivity was consistent with patterns of change observed in coastal forests of western Oregon (Alig et al. 2005), and the more general relationship of resource development to ecosystem productivity as a common aspect of human development (DeFries et al. 2004; Huston 2005).

A consequence of depletion of rare forest types, such as large tree stands, karst forests, and high-volume forests that are contiguous at a landscape scale, is that habitat quality may also decline and adversely affect populations of fish and wildlife. For example, results of studies show a range of functions associated with large-tree forests, including provision of black bear (*Ursus americanus*) dens (Erikson et al. 1982), winter habitat for Sitka black-tailed deer (*Ococoileus hemionus sitkensis*) (Schoen & Kirchhoff 1990), nesting habitat for Northern Goshawk (*Accipiter gentilis*) (Iverson et al. 1996), and woody debris in streams that serves as structural habitat for salmon and other species (Heifetz et al. 1986; Willson & Halupka 1995). Similarly, karst exhibits attributes that make it highly productive for salmon (Bryant et al. 1998), yet

Table 2. Results of logistic regression model of forest types in southeastern Alaska that were either logged (1) or not logged (0) during 1954–2004.

Variable	*Odds ratio*[a]	*Coefficient*[b]	*SE*	*Wald* χ^2	*p*
Intercept	0.00	−7.35	0.17	1910.01	<0.0001
Landscape forest ($m^3 \times 1000/km^2$)	1.22	0.20	0.01	1175.52	<0.0001
Timber volume (m^3/ha)	1.02	0.02	0.00	499.51	<0.0001
Elevation (m × 100)	0.66	−0.42	0.02	479.22	<0.0001
Biogeographic province					
North Prince of Wales	2.34	0.85	0.05	277.46	<0.0001
East Baranof Island	2.34	0.85	0.15	30.92	<0.0001
Chichagof and Admiralty Island	2.16	0.77	0.07	119.22	<0.0001
Wrangell, Etolin, and Zarembo	2.14	0.76	0.10	62.78	<0.0001
Kupreanof and Mitkof	1.89	0.64	0.08	68.14	<0.0001
West Baranof Island	1.77	0.57	0.13	19.01	<0.0001
Revilla Island and Cleveland Peninsula	1.36	0.31	0.07	18.35	<0.0001
Dall Island Complex	1.25	0.22	0.12	3.53	0.0603
Outside Islands	1.00	0.00	0.15	0.00	0.9962
Chilkat River	0.90	−0.11	0.12	0.76	0.3836
Kuiu Island	0.56	−0.57	0.10	30.01	<0.0001
Taku River	0.44	−0.82	0.12	47.72	<0.0001
Yakutat Forelands	0.43	−0.84	0.16	25.84	<0.0001
Stikine River and Misty Fiords	0.39	−0.94	0.13	49.62	<0.0001
Lynn Canal and Glacier Bay	0.20	−1.61	0.21	56.56	<0.0001

[a] *Odds ratio represents the change in likelihood that a site was logged with a 1-unit change in a continuous predictor variable or the relative likelihood of logging among biogeographic provinces.*
[b] *Multiple logistic-regression coefficients indicate the overall preference for (coefficient > 0) or avoidance of (coefficient < 0) specific forest types or locations on the basis of historical patterns of logging with other factors held constant.*

karst is sensitive to increased soil erosion from road construction and logging (Baichtal & Swanston 1996). Landscape-scale blocks of old-growth forest are habitat for northern flying squirrels (*Glaucomys sabrinus*) on Prince of Wales Island and a key indicator of population persistence over time (Smith & Person 2007). Although both brown bears and wolves (*Canis lupus*) use a variety of areas, including old growth, they are particularly sensitive to fragmentation of landscapes by logging roads because roads increase risks of human-induced mortality (Schoen et al. 1994; Person & Russell 2008).

The sensitivity of species to changes in forested areas is recognized in the 1997 Tongass Land Management Plan that designated the Northern Goshawk as a "sensitive species," the northern flying squirrel and Marbled Murrelet as "species of concern," and the brown bear, wolf, and Sitka deer as "management indicator species" (USFS 2008*a*). Concerns regarding population viability of some species led the USFS to establish an Interagency Viable Population Committee that designed a landscape conservation strategy to address viability of species associated with old growth (USFS 2008*b*).

Nowhere are these factors more evident than on northern Prince of Wales Island. This province has extensive low-elevation karst, landscape-scale tracts of productive forests, high-quality habitat for a range of species (Albert & Schoen 2007), and is an important center of endemism (Cook & MacDonald 2001; Cook et al. 2006). The island has also sustained the highest rates of logging in the region (Albert & Schoen 2007; DellaSala et al. 2011:58). Although northern Prince of Wales contained only 10.9% of all productive forests in the region in 1954 it received 37.8% of all the logging. Consequently, 93.5% of its highest volume landscape-scale blocks of old growth had been logged.

The specific threshold at which habitat alteration affects population viability is difficult to determine (Fahrig 2001). However, results of a review of habitat thresholds literature (to inform forest planning in coastal British Columbia) indicated that maintaining loss of habitat below 40% of historical abundance poses a low risk to most species, whereas declines above that level result in less confidence that risks of extirpation will remain low (Price et al. 2009). On the basis of this criterion, rare forest types that have been reduced by >40% of historical abundance such as landscape-scale blocks of high-volume old growth, and particularly those on Prince of Wales Island, may warrant special consideration (Cook et al. 2006). Such a proactive approach to maintain forest diversity is particularly important because declines in the abundance and distribution of local populations of plants and animals may not be quantitatively measured for decades or centuries after habitat modification has occurred (Tilman 1994).

From a global perspective, southeastern Alaska supports a relatively low human population density, has developed industrially later than regions to the south, and continues to support populations of species such as salmon, brown bears, wolves, and Marbled Murrelets that have become rare or have been extirpated from more developed regions (DellaSala et al. 2011). Locally, the focus of logging within areas of higher productivity is typical

of agrarian expansion into previously undeveloped lands (Huston 2005) and likely reflects processes that contributed to the decline of these species elsewhere. Our model provides a spatial framework within which to identify remaining old-growth forests that have been disproportionately logged and provides a historical reference for planning restoration of functional attributes such as landscape-scale connectivity among forests blocks. Such tools may be particularly relevant in the context of recent petitions to list endemic subspecies associated with productive old-growth forest such as Queen Charlotte Goshawk (*A. g. laingi*), Prince of Wales flying squirrel (*G. s. griseifrons*), and Alexander Archipelago wolf (*C. l. ligoni*) for protective status under the U.S. Endangered Species Act. These results provide a baseline for assessing the distribution and abundance of rare ecosystems (e.g., large-tree old growth) on the basis of historical patterns of change and have implications for planning for ecological sustainability (Lindenmayer et al. 2000) and future management of forest resources in southeastern Alaska and elsewhere (DeFries et al. 2004; Turner et al. 2007).

Acknowledgments

We thank The Gordon and Betty Moore Foundation, The William and Flora Hewlett Foundation, Wilburforce Foundation, and the Nongame Partner Program of Alaska Department of Fish and Game for support of this work. Useful advice and guidance were provided by E. Dovichin, J. Sisk, and M. Kirchhoff. This manuscript greatly benefited from critical review by P. Alaback, D. DellaSala, J. Caouette, P. Kareiva, M. Smith, and 3 anonymous reviewers.

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United States Department of Agriculture

Forest Service

R10-MB-734

November 2011

Version 1.0

USDA Investment Strategy in Support of Rural Communities in Southeast Alaska 2011-2013

On the Cover

Visitor Services, *top left: Cruise ships docked in downtown Juneau during the busy summer tourist season*

Ocean Products, *top right: Seiner-caught salmon, vital to the economy of Southeast Alaska.*

Forest Products, *bottom left: Stacked lumber at Viking Lumber Co. on Prince of Wales Island.*

Renewable Energy*, bottom right: Energy efficient boiler that heats the Southeast Alaska Discovery Center in Ketchikan.*

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Executive Summary

Most rural communities in Southeast Alaska are experiencing declining populations, fewer job opportunities, and increasing energy costs. USDA agencies (Farm Service Agency, Forest Service, Rural Development) and the U.S. Economic Development Administration (USEDA) are partnering to revitalize communities and restore public lands by supporting job creation in areas that offer growth potential: fisheries and mariculture, recreation and tourism, forest management, and renewable energy. The goals of this USDA Investment Strategy (Strategy) include:

- creating quality jobs and sustainable economic growth;
- promoting small business creation, expansion, and retention;
- improving access to capital; and
- promoting job training and educational opportunities.

Working with the Juneau Economic Development Council (JEDC), USDA agencies collaborated with over 120 leaders from local businesses and communities to identify initiatives in four areas—Ocean Products, Visitor Services, Forest Products, and Renewable Energy—that will create a regional competitive advantage, thereby raising the economic conditions for all of Southeast Alaskans[1]. This is the first time a broad-based, interagency, regional collaborative assessment focusing on economic clusters has been attempted in Southeast Alaska.

This interagency team recommends improving community and ecological health by funding economic initiatives that: cross agency boundaries; align with current actions by USDA agencies; have a high likelihood for success; and are readily achievable. The initiatives include:

- Ocean Products: Increase watershed restoration activities so as to increase wild salmon production; include the seafood industry in USDA programs; study the use of fish byproducts for renewable energy purposes; and support mariculture through zoning adjustments and financial assistance.

- Visitor Products: Create independent traveler opportunities by developing multi-community land and water trails; increase opportunities for guided access; and improve opportunities to provide input regarding Tongass National Forest access fees.

- Forest Products: Promote new opportunities from second growth forest while maintaining support to the existing industry; showcase the use of young growth wood in local structures; simplify the small timber sale process; improve the Tongass timber planning process; catalyze the use of wood waste for energy; and develop a detailed analysis on the volume of young growth available across all lands.

- Renewable Energy: Collaborate with the State of Alaska to develop a Southeast renewable energy plan; increase agency support to renewable energy development projects; convert agency administrative facilities from oil to renewable energy; increase use of the Biomass Crop Assistance Program (BCAP).

USDA has identified about $30 million of existing funding to support these initiatives. In order to grow these economic sectors, however, USDA recommends an additional $29 million investment over the next two years. Given the current challenging economic times and likely decreasing federal budgets, an "all-hands-all-lands approach" of leveraging resources across agencies will be essential. Combining grant and loan programs provided by Rural Development, Farm Service Agency, U.S. Economic Development

[1] The full report can be found at www.jedc.org.

Administration, and Forest Service State and Private Forestry with annual appropriations can increase access to capital to facilitate entrepreneurship and economic growth. In the past two years, over $40 million in guaranteed loans and grants have been provided to communities, businesses, and non-profits in Southeast Alaska. Of these funds, over $10 million was directly in support of initiatives similar to those identified by the economic cluster groups.

Table 1. **Summary of planned and recommended investments to improve economic opportunities for rural communities in Ocean Products, Visitor Products, Forest Products, and Renewable Energy.**

USDA Investments Oceans, Visitors, Forests, Energy R10 - Tongass	Investments Planned For FY12 & FY13	Recommended Additional Funding to Increase Growth FY12 & FY13	Total of Planned and Recommended Investments in FY12 & FY13
Oceans	6,478,000	5,650,000	12,128,000
Visitors	1,912,000	8,370,000	10,282,000
Forests	24,967,000	11,775,000	36,742,000
Energy	728,000	3,355,000[1]	4,083,000
Total	**$34,085,000**	**$29,150,000**	**$63,235,000**

1 – Does not include $20 million to convert federal facilities in Southeast Alaska from oil to biomass heat.

In addition to financial investments and leveraging resources, collaboration, community capacity, and interagency coordination will be important to the success of this Strategy. USDA will also continue to support the business cluster work groups, launch a grant-making program to improve community capacity, and maintain an emphasis on interagency leadership and coordination. USDA will provide financial support to the business cluster work groups for facilitation, which continue to meet and have shifted their focus to implementation of the initiatives. The community capacity grant program will give communities additional resources to gain technical assistance in writing business, energy, or tourism plans, or convene and plan watershed restoration meetings, for example. Finally, USDA agencies, USEDA, and other partners will continue to meet at least quarterly to leverage resources and programs.

USDA in Alaska sees this Strategy as an ongoing, dynamic effort built on strengthening relationships among agencies, partners, and with businesses; finding shared visions and solutions; and directing USDA resources in areas that have the greatest potential to create sustainable jobs and healthy communities. USDA expects to update this plan in two years or sooner, if needed.

Introduction

Recognizing the pressing social, economic, and environmental challenges facing forest-dependent rural communities in Southeast Alaska, in May 2010 Secretary of Agriculture Tom Vilsack directed the U.S. Forest Service (USFS), Rural Development (RD), and the Farm Service Agency (FSA) to work with the U.S. Economic Development Administration (USEDA) and regional partners to enhance economic opportunities while maintaining community and ecosystem health.

This Transition Framework for Economic Diversification was initiated to assist Southeast Alaska communities in diversifying their economies through renewed collaborative efforts among public and private entities. Initially, the Framework focused on challenges with harvesting of old growth timber on the Tongass. Upon closer examination, it became clear that broadening the focus to natural resource management in general would be necessary given the breadth of challenges. It also became clear that considerable attention to strengthening the economy was needed.

To implement the Framework, USDA and USEDA formed an Implementation Team and established a two-year timeline. The team adopted a collaborative approach with the goals of increasing employment and improving community and ecosystem health in four areas: renewable energy, forest management, fisheries and mariculture, and tourism and recreation. The team recognized early that a significant investment in strengthening and building collaboration and partnerships was essential to success.

In September 2010, the Forest Service contracted the Juneau Economic Development Council to complete an economic development asset map and report that outlined the human, financial, institutional, and natural assets of Southeast Alaska. The report identifies many of the assets and barriers to economic development in the region. Assets include the abundance of natural beauty and recreational opportunities, cultural opportunities, safety, and availability of high-speed internet. Barriers include high freight, electricity, and real estate costs, government regulations, lack of transportation and infrastructure, limited collaboration, and limited education and workforce readiness.

JEDC used the report and map to develop an economic action plan for job creation in Southeast Alaska organized around four important economic sectors for the regional economy: Ocean Products, Visitor Services, Forest Products, and Renewable Energy. Economic cluster working groups generated the basis of the plan. More than 100 leaders from state, private, non-governmental, and federal organizations and groups have participated in this collaborative effort to date.

In May 2011, JEDC summarized over 30 major action initiatives developed by the cluster working groups. The report is available at: http://jedc.org/seclusterinitiative.php. The three USDA agencies and USEDA then identified those action initiatives that agency resources could support in the next two years. In particular, initiatives were selected that:

- align with USDA agency programs;
- cross agency boundaries; and
- have a high likelihood for success (especially in the near-term), are readily achievable, and create the greatest benefit within the limited resources available.

This USDA Investment Strategy for Southeast Alaska (hereafter Strategy) summarizes the work that has already been accomplished in support of these initiatives, outlines what the agencies intend to do in the next two years, and what additional work can be done if additional resources were available.

Why does USDA need to be involved in job growth?

Most of the land in Southeast Alaska is publicly owned. The Forest Service manages the 17 million acres of the Tongass National Forest, nearly 80% of the land base. Approximately 70,000 people reside in 32 towns and villages in Southeast Alaska, many of which are accessible only by boat or plane. Residents rely heavily on natural resource-based industries. Currently the fishing, tourism, and mining industries support the largest number of jobs.

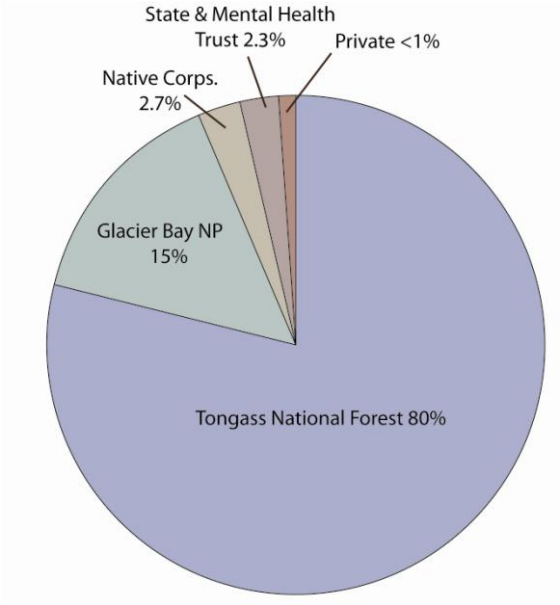


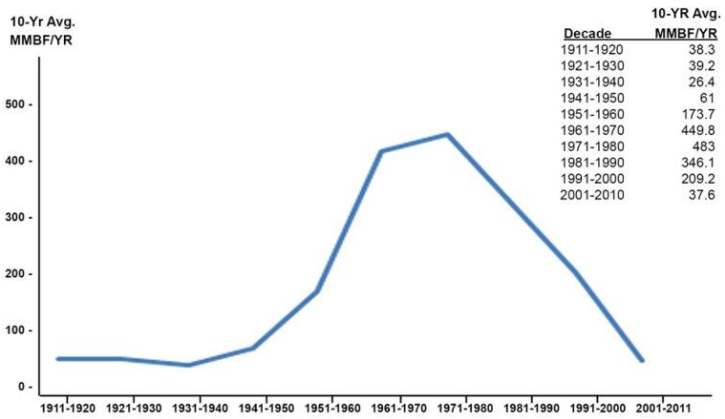
Figure 1. Landownership in Southeast Alaska

Today, communities in Southeast Alaska are facing rising energy costs, out-migration, and overall economic decline, not unlike rural areas in other parts of the U.S. Declines can be seen in economic indicators such as population, income, and youth as a proportion of population, all of which are indicators of community health.

Historically, the timber industry provided the backbone to stable economies. At its peak, jobs in the timber industry were comparable to the fishing industry. Today, timber jobs are at the lowest level in the last 50 years. With an ongoing decline in timber harvest, and renewed national interest in roadless area and old growth conservation, communities now face unprecedented economic challenges.

Research has shown that the region's population is aging more quickly than the rest of Alaska and the nation. From 2000 to 2009, the number of people between the ages of 55 to 69 increased by 60 percent, while every age group below age 49 decreased during the same time period. To reverse the downward trend in population, particularly with youth, local communities must have healthy economies, available housing, a reasonable cost of living, and job opportunities.

The decline in population is linked to the decline of the timber industry, manufacturing industries, fishing industry, and reduction in state and federal jobs. High fuel prices and increased costs of living have led many who live in smaller communities to migrate out. Young people are moving away and schools are closing. For some communities, the loss of even one family with children can mean that the local school enrollment falls below the minimum number required by the state for the school to remain open.



Decade	10-YR Avg. MMBF/YR
1911-1920	38.3
1921-1930	39.2
1931-1940	26.4
1941-1950	61
1951-1960	173.7
1961-1970	449.8
1971-1980	483
1981-1990	346.1
1991-2000	209.2
2001-2010	37.6

Figure 2. 100 Years of Timber Harvest from the Tongass National Forest

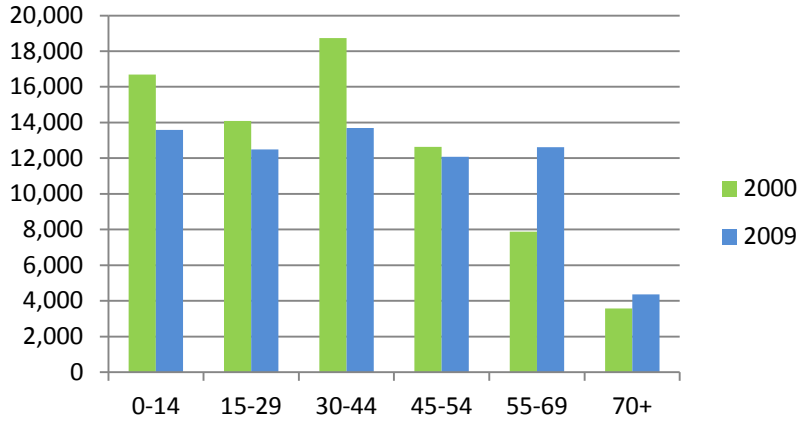


Figure 3. Changes in Population Based on Age

In spite of these overall trends, the region is rich in natural and cultural resources with healthy populations of salmon, healthy forests, and abundant wildlife populations. Animals thrive in Southeast Alaska that are rare elsewhere, such as brown bears, mountain goats, wolverines, bald eagles, black oystercatchers and trumpeter swans. Local community and Native connections to the region are strong and enduring. The vibrant people and communities create the foundation for a strong economy.

What is USDA and USEDA's role?

Creating jobs, growing the economy, and supporting healthy communities require an "all-hands-all-lands" approach in which USDA and USEDA are important partners. By increasing collaboration across agencies, we can leverage resources, support entrepreneurs, and facilitate people working together to create healthy communities and a healthy environment.

USDA and USEDA have a track record of supporting economic growth and healthy communities in Alaska by working with key business leaders, state, tribal, and local governments and communities. Individually, each of these four agencies has established programs and authorities that will help alleviate economic challenges in Southeast Alaska. By coordinating and implementing the variety of programs within this plan, we hope to decrease duplication and improve outcomes.

Revitalizing and maintaining community sustainability requires attention to the interrelation and interdependency of the region's economy, ecology, and culture. Now, more than ever, a collective focus is needed to improve the health of the 32 communities in Southeast Alaska. USDA agencies and USEDA are committed to providing the resources, leadership, and support necessary to support making this happen.

This Strategy marks an important milestone for as federal and state governments work with the people, industries, and communities of Southeast Alaska to support job creation and improve rural community health. Given this is the first interagency plan of its kind, periodic review and adjustments will be necessary.

Agency Programs

The agencies of the USDA and USEDA already have programs and authorities in place that allow them to respond to those "readily achievable" action initiatives defined by the cluster working groups. The Strategy and initiatives are also well aligned with Goal 1 of USDA's Strategic Plan for 2010-2015, which states, "The Department will provide on-the-ground support (financial, technical and planning assistance) for local multi-county, community-driven strategic plans." Below is a list of agencies involved in the Strategy for Southeast Alaska and their respective roles, programs, and authorities.

The **U.S. Forest Service** has a broad multiple-use management mission to meet the diverse needs of people. For example, providing wood fiber, water, minerals, and a place to hunt, fish, and enjoy wilderness are all within the mission. Through its State and Private Forestry branch, the Forest Service provides technical and financial assistance to state and private forest landowners. "The Principal Laws Relating to Forest Service State and Private Forestry Programs"[2] include:

- The Cooperative Forestry Assistance Act of 1978, as amended through 2008
- Economic Action and Rural Development Program authorities
- Forest Products Conservation and Recycling Program authorities
- Watershed Restoration and Enhancement (Wyden Amendment)
- Biomass Commercial Utilization Grant authorities
- Tribal Watershed Forestry Assistance authorities.

The scientists of the Pacific Northwest Research Station (PNW) develop and deliver knowledge and technology through decades of research which has encompassed climate change, forest health, fish and wildlife habitat, imperiled species, and the socio-economic importance of forests to people from every walk of life. The Sitka Wood Utilization Center, a sub-unit of PNW, provides local specialized expertise.

USDA Rural Development works in partnership with the private sector and community-based organizations on many fronts. In general, they provide loan guarantees, direct loans, and grants across a wide range of programs for community and economic development.

- The Business Program funds projects that create or preserve quality jobs and/or promote a clean rural environment.

- The Cooperative Program promotes an understanding and use of the cooperative form of business as a viable organizational option for marketing and distributing agricultural products.

- The Single Family Housing Programs and Multi-Family Housing Programs provide homeownership opportunities to low- and moderate-income rural Americans, the elderly, and persons with disabilities through several loan, grant, and loan guarantee programs. This is important in Southeast Alaska where the lack of affordable housing contributes to the decline in population. The funds may also be used to buy and improve land and to provide necessary facilities such as water and waste disposal systems.

- Community Programs provide loans and grants and loan guarantees for water and environmental projects such as water systems, waste systems, solid waste, and storm drainage facilities. Community Facility loans, loan guarantees, and grants also fund hospitals, fire protection, and safety, as well as many other community-based needs and initiatives.

[2] The full document can be found under "Southeast Alaska Economic Diversification Transition Framework" at http:/www.fs.usda.gov/r10.

- The Electric Programs provide leadership and capital to upgrade, expand, maintain, and replace rural electric infrastructure.

- Telecommunications Loans and Grants finance voice telephone service. The Broadband Access Loan program provides loans for funding the costs of construction, improvement, and acquisition of facilities to provide broadband service to eligible communities.

- Water and Environmental Programs provides loans, grants and loan guarantees for drinking water, sanitary sewer, solid waste and storm drainage facilities in rural areas and cities and towns of 10,000 or less.

The **Farm Service Agency** has a long-standing tradition of conserving the nation's natural resources through the Conservation Reserve Program. It provides farmers with a strong safety net through the administration of farm commodity programs. The agency provides credit to agricultural producers who are unable to receive private, commercial credit, with a special emphasis on providing loans to beginning, minority and women farmers and ranchers. While Southeast Alaska does not produce a lot of agricultural crops, FSA programs benefit entrepreneurs interesting in pursuing mariculture opportunities.

FSA administers the Biomass Crop Assistance Program[3] (BCAP) which provides financial assistance to owners and operators of agricultural and non-industrial private forest land who wish to establish, produce, and deliver biomass feedstocks. This program could help kick start the biomass industry in Southeast by investing additional funds to support development of a pellet manufacturing facility. Matching payments may be available for the delivery of eligible material to qualified biomass conversion facilities by eligible material owners. Qualified biomass conversion facilities produce heat, power, bio-based products, or advanced biofuels from biomass feedstocks.

The mission of the **U.S. Economic Development Administration** is to lead the federal economic development agenda by promoting innovation and competitiveness, preparing American regions for growth and success in the worldwide economy. USEDA is guided by the basic principle that distressed communities must be empowered to develop and implement their own economic development and revitalization strategies. USEDA assistance is available to rural and urban areas of the Nation experiencing high unemployment, low income, or other severe economic distress. They accomplish this by:

- Promoting business policies that help businesses and entrepreneurs and their communities grow and succeed.

- Promoting the Administration's National Export Initiative as well as attracting Foreign Direct Investment in the U.S.

- Focusing on research and development that moves quickly from the lab to the marketplace.

[3] http://www.fsa.usda.gov/FSA/webapp?area=home&subject=ener&topic=bcap&utm_source=spotlight&utm_medium=click&utm_content=rotation2&utm_campaign=bcapeducation

Agency Investments in Support of Economic Growth

The Strategy highlights actions and programs that will: accomplish selected regional business cluster initiatives identified in the May 2011 JEDC report; improve community capacity and infrastructure; and leverage multiple agency programs and resources. The interagency leadership team recommends investment in the following three areas that cut across all economic sectors:

1. **Collaborative Working Groups—**The Forest Service will continue to support regional business sector working groups. The existing four groups (Ocean Products, Visitor Products, Forest Products, and Renewable Energy) are just beginning to operate with a high degree of enthusiasm. Continued facilitation and staff support is needed to help these groups be successful, and to potentially expand support to new clusters (estimated cost between $100,000 to $200,000/yr).

2. **Community Capacity—**This fall, USFS, RD, and private partners will launch a community level grant program similar to a Community Capacity and Land Stewardship program in Oregon and Washington. This small grant program provides critical community capacity seed money in such areas as supporting entrepreneurs to write business plans, helping communities hire facilitators for community planning, recreation and tourism planning or energy planning, and investments in community watershed stewardship groups ($100,000 – $200,000/yr.).

3. **Interagency Leadership—**The interagency leadership team has proven a valuable means to ensure federal, state, and private resources are leveraged as effectively as possible to facilitate economic investments. USDA and USEDA will continue to partner in regional and local collaborative efforts to promote a stronger economy, jobs, and healthy communities. While all these agencies do this work to varying degrees, maintaining an emphasis on interagency leadership will help Southeast Alaska communities thrive.

In addition to these three overarching strategies, initiatives selected by the USDA/USEDA Implementation team (those that are ripe for action), are listed below under the following economic sectors: Ocean Products, Visitor Services, Forest Products, and Renewable Energy. Each initiative includes background on the issue, the opportunity for action, and next steps. Many initiatives also include financial investment tables, which capture much of the agency funding in these industries over the past two years (FY10&11), the expected funding assuming continued budgets at approximately the current level (FY12&13), and recommendations for additional financial investment to accelerate growth in that sector.

This set of initiatives are an important starting point and are subject to change as collaborative groups invest more effort into them. As the business sector work groups continue to meet and develop new ideas, USDA partners plan to periodically update these action items.

Ocean Products

The ocean products industry is the largest private sector wage payer and second largest employer in Southeast Alaska. Fishing is not only an important economic driver for rural communities, but Southeast Alaskans are deeply connected to the ocean and seafood as a way of life. The Ocean Products Cluster Working Group identified 11 action initiatives to increase jobs and support healthy communities. The Implementation Team selected four initiatives that USDA can contribute to in the next two years.

INITIATIVE 1—Increase wild salmon production through habitat restoration.

Background: Many important salmon streams are in a degraded condition across the Tongass National Forest. Restoring degraded salmon streams will create immediate jobs in restoration, such as heavy equipment operation, and is expected to increase salmon productivity. An increase in salmon productivity would increase the opportunity for commercial, sport, and subsistence harvest as well as additional jobs in the fishing industry. In the past two years, including American Recovery and Reinvestment Act (ARRA) funding, the Forest Service has invested over $10 million in watershed restoration to improve degraded salmon habitat in the Tongass. Typically, the Tongass receives $1.5 million/year for these efforts. Over $100 million is needed to address the remaining watershed restoration work. At the current funding rate, it will take over 50 years to address the major problems affecting wild salmon production on the Tongass.

Watershed restoration project adds wood to stream to create fish habitat.

Action: Increase investments in watershed restoration to improve ecosystem and community health in Southeast Alaska. The Tongass National Forest proposes to triple the annual funding for watershed restoration to $4.6 million.

Lead agency: Forest Service

Table 2. **Summary of financial investments in watershed restoration across the Tongass National Forest that support Ocean Products Initiative 1. Investments are categorized into two year periods, and include past, projected and future investments needed to grow the sector.**

Tongass NF Investments in Increasing Wild Salmon Production through Watershed Restoration	Participants	Type of Investment	Investments Made FY10&FY11	Investments Planned FY12&FY13[4]	Recommended Funding to Increase Growth in FY12&FY13
Restoration of Priority Watersheds: Craig, Thorne Bay, Ketchikan, Wrangell, Sitka, Hoonah, Petersburg	TNC, USFS, SCS, TU, ADF&G	Whole watershed approach focused on salmon	$1,992,900	$1,225,000	$2,800,000
Fish-pass structure maintenance and enhancements at Thorne Bay, Admiralty NM, Yakutat, Hyder, Sitka, Petersburg, Craig	USFS, SCS	Older salmon passage structures deferred maintenance and reconstruction	$1,689,000	$700,000	$1,300,000
"Red" pipe removal and/or replacements, road maintenance, and storage Wrangell, Sitkoh River, Revilla, Kake, POW	USFS	Road and culvert deferred maintenance affecting water quality and salmon passage	$5,658,000	$678,000	$500,000
Riparian thinning and instream restoration at Staney Creek, Zarembo, Twelvemile, Sitkoh River, Saginaw	USFS, RAC, TNC, NFF, SCS, TU, State	Restoration of priority stream reaches to repair "hot spots"	$737,400	$625,000	$300,000
Salmon stock recolonization and enhancement: Ketchikan, Sitka, Wrangell	USFS	Projects to reestablish or strengthen salmon runs in restored watersheds	$540,000	$400,000	$150,000
Research to Evaluate Restoration Effectiveness - Implement the NetMap toolbox for the Tongass National Forest	USFS Research	To target stream reaches where restoration is appropriate and effective	$97,000	0	$250,000
Research to Evaluate Restoration Effectiveness - Conduct a vulnerability assessment of climate change impacts on freshwater spawning and rearing habitat	USFS Research	Assess impacts of climate change on salmon as relates to restoration	0	0	$75,000
Research to Evaluate Restoration Effectiveness - Develop monitoring indicators and protocol to assess the effectiveness of stream restoration	USFS Research	Required to implementing monitoring	0	0	$275,000
TOTAL			**$10,617,300**	**$3,628,000**	**$5,650,000**

USFS = Forest Service, TNC = The Nature Conservancy, SCS = Sitka Conservation Society, RAC = Resource Advisory Council, TU = Trout Unlimited, NFF = National Forest Foundation, State = State of Alaska, ADF&G = Alaska Department of Fish & Game.

[4] Investments planned with annual appropriations assuming budgets at similar levels.

INITIATIVE 2—Include the seafood industry in USDA programs.

Background: USDA has several programs designed to promote agriculture development, but the seafood industry often does not qualify for the economic assistance either because it is excluded or because of regulatory roadblocks. The Ocean Products cluster identified mariculture as a significant source of employment and economic opportunity in Southeast Alaska. Access to capital to make investments in this industry is critical to success and would allow this industry to get off the ground much more quickly.

Action: Identify and promote ways to include mariculture development among the traditional USDA agriculture programs.

Ocean products sector has the largest payroll in Southeast Alaska.

Lead agency: Farm Service Agency

INITIATIVE 3—Study the conversion of Southeast Alaska fish byproduct to biogas and fertilizer through anaerobic digestion.

Background: Commercial fishing provides millions in economic activity and thousands of jobs in Southeast Alaska. It also creates significant amounts of fish waste that is often dumped into the ocean, creating environmental problems near communities. Processing the currently underutilized resources could create economic opportunities and jobs in the region.

Action: Rural Development will consider funding projects that would convert fish waste to energy through their Business Loan Guarantee Program.

Lead agency: Rural Development

INITIATIVE 4—Strengthen the region-wide mariculture industry through zoning and support to entrepreneurs.

Background: Studies estimate that the mariculture industry could provide hundreds of jobs and $20-50 million of economic activity in Southeast Alaska. Mariculture could provide important jobs for small, struggling rural communities, but industry growth is dependent on federal program support to local entrepreneurs as well as acceptable areas for farm sites. To date, FSA has lent approximately $450,000 to oyster farmers in the region.

Action: Improve collaboration among state and federal agencies, and the public, to increase loans to the mariculture industry. Identify acceptable areas for mariculture development through public planning and agency coordination.

Lead agency: Farm Service Agency

Table 3. **Summary of financial investments in mariculture across Southeast Alaska that support Ocean Products Initiative 4. Investments are categorized into two year periods, and include past, projected and future investments needed to grow the industry.**

USDA Investments in Support of Mariculture in Southeast Alaska	Participants	Type of Investment	Investments Made FY10&FY11	Investments Planned FY12&FY13[5]	Recommended Funding to Increase Growth in FY12&FY13
Loans to oyster farmers	FSA	Mariculture Entrepreneurship	$450,000	*	*
Community facilities to support mariculture industry; Geoduck nursery and mariculture technical assistance Ketchikan, Kake, Southeast Alaska	RD Enterprise Grant, USEDA	Mariculture Entrepreneurship	$2,099,956	$500,000	*
Development of oyster-towers best practices manual	RD Enterprise Grant	Mariculture Entrepreneurship	$29,500	*	*
Dock renovations, seaport revitalization, Petersburg, Kake, Saxman	USEDA	Seaport Community Infrastructure	$4,628,800	$2,000,000	*
TOTAL			**$7,208,256**	**$2,500,000**	*

FSA = Farm Service Agency, RD = Rural Development, USEDA = Economic Development Administration

* Until FSA, RD, & DOC receive loan applications, it will be difficult to anticipate needed funds.

Restoration of streams on the Tongass National Forest boosts salmon populations.

[5] Investments planned with annual appropriations assuming budgets at similar levels.

ADDITIONAL OPPORTUNITIES

Traditionally, USEDA and RD have provided infrastructure support to the ocean products industry. Over $7 million in financing to build docks, vessels, and housing has been provided in the past two years. Applicants have indicated the need for about $2 million over the next two years. This amount could greatly increase as growth opportunities develop.

Table 4. **Summary of additional opportunities for investment in the ocean products industry in Southeast Alaska. Investments are categorized into two year periods, and include past, projected and future investments needed to grow the industry.**

USDA Investments in Support of Ocean Products Southeast Alaska	Participants	Type of Investment	Investments Made FY10&FY11	Investments Planned FY12&FY13[6]	Recommended Funding to Increase Growth in FY12&FY13
New fishing vessel construction, Petersburg	RD loan guarantee	Fishing Vessel Entrepreneurship	$1,100,000	*	*
Total			**$1,100,000**	*	*

RD = Rural Development

* Until FSA, RD, & USEDA receive grant or loan applications, it will be difficult to anticipate needed funds.

[6] Investments planned with annual appropriations assuming budgets at similar levels.

Visitor Products

The visitor industry is the largest private sector employer (5,689 jobs in 2009) in Southeast, accounting for 15% of all regional employment, and 10% of all regional wages. Tourism has been the fastest growing industry in Southeast Alaska for the last decade.

The Visitor Products Cluster Working Group identified five action initiatives to increase jobs and support healthy communities. The USDA/USEDA implementation team selected three of these initiatives to focus on in the next two years.

INITIATIVE 1—Develop multi-purpose, multi-community land and water trails and support facilities.

Background: Southeast Alaska is a world class recreation and tourism destination. Juneau and Sitka have greatly expanded their community trail systems through partnerships with Sitka Trail Works and Juneau Trail Mix. These trail networks have become very popular with the locals and tourists by allowing visitors to enjoy both the outdoors and the amenities available in local communities. This approach could be expanded through the region creating a new niche for Southeast visitors.

Action: Increase independent travelers to Southeast Alaska through improved public awareness about community trail systems; expanded infrastructure development, particularly trail and cabin infrastructure improvements to provide a broad range of accessible visitor experiences; and increased collaboration with SEAtrails, a regional non-profit focused on supporting community trails. The Tongass National Forest has requested a significant increase in funding for multi-community trail projects and young growth cabin developments.

Lead Agency: Forest Service

New concrete stairs connects two trails and improves access at the Mendenhall Glacier Visitor Center in Juneau.

Table 5. **Summary of financial investments in infrastructure across Southeast Alaska that support Visitor Products Initiative 1. Investments are categorized into two-year periods, and include past, projected and future investments needed to grow the industry.**

Infrastructure Investments in Support of Visitor Products in Southeast Alaska	Participants	Type of Investment	Investments Made FY10&FY11	Investments Planned FY12&FY13[7]	Recommended Funding to Increase Growth in FY12&FY13
Multi-community trails Projects	USFS, Sitka Trail Works, Juneau Trail Mix, State, Multiple Community Partners	Increase independent travelers & improve community trails	$9,126,200	$514,600	$4,500,000
Construct young growth cabins and shelters associated with community trail systems	USFS, Sitka Trail Works, Juneau Trail Mix, Prince of Wales, University of Alaska, Multiple Community Partners	Increase number of independent travelers by providing hut to hut trails connected to communities	$350,000	$150,000	$600,000
Young growth cabin groups in community campgrounds	USFS, Sitka Trail Works, Juneau Trail Mix, Ketchikan, Multiple Community Partners	Increase number of independent travelers; road accessible mini-cabins in existing campgrounds	0	0	$450,000
Research to enhance development of multi-community trails and infrastructure to promote independent traveler industry	USFS Research, Partners	Analyze characteristics and features of successful multi-community linked recreation systems	0	0	$125,000
Cabins: survey design, construct, replace, maintain at Admiralty National Monument, Hoonah, Ketchikan, Sitka, Wrangell, Juneau	USFS, Friends of Tongass Cabins	Deferred Maintenance and Reconstruction	$2,017,100	$786,800	*See young growth cabins under #1
Total			**$11,493,300**	**$1,452,400**	**$5,675,000**

USFS = Forest Service

INITIATIVE 2—Increase guided access to public land.

Background: The demand for guided recreation tours exceeds available permits on the Tongass National Forest. Increasing guided access to public land will promote economic opportunity and job growth, while maintaining a quality outdoors experience for visitors.

Action: Improve coordination and communication between the outfitter and guide industry and the USFS to increase access. The USFS will hold both pre- and post-season meetings to identify opportunities for additional use, potentially by adjusting schedules among operators; use post-season meetings to evaluate season and consider adjustments; and evaluate ways to improve decision-maker flexibility in allocations through NEPA documents. The Tongass National Forest has requested $150,000 to improve decision-making flexibility in commercial permitting.

[7] Investments planned with annual appropriations assuming budgets at similar levels.

Lead Agency: Forest Service

***Table 6*. Summary of financial investments to increase guided access to public lands through improved permitting, supporting Visitor Products Initiative 2. Investments are categorized into two-year periods, and include past, projected and future investments needed to grow the industry.**

Investments to Increase Guided Access on the Tongass National Forest	Participants	Type of Investment	Investments Made FY10&FY11	Investments Planned FY12&FY13[8]	Recommended Funding to Increase Growth in FY12&FY13
Evaluate ways to improve decision-maker flexibility in allocating commercial use in NEPA decisions documents	USFS, Research, Partners	Increase guided public access to the Tongass	0	0	$150,000

USFS = Forest Service

A new elevated walkway at Mendenhall Glacier will improve visitor services for the 400,000 visitors per year.

[8] Investments planned with annual appropriations assuming budgets at similar levels.

INITIATIVE 3—Strengthen accountability for Tongass access fees.

Background: The Tongass National Forest collects over $2 million per year in recreation user fees, which are used to operate and maintain the facilities where the fees were collected. They are also used to administer commercial outfitter and guide permits and to operate and maintain facilities used by these groups. The fees are currently allocated to projects annually by a fee board of Tongass employees. Public understanding of how these fees are spent and accounted for is limited.

Action: To strengthen accountability for how access fees are used, the Tongass National Forest will involve representatives of the outfitter and guide industry, cabin users, and others in the fee allocations process as well as develop better ways to inform the public about how fees are used.

Lead Agency: Forest Service

ADDITIONAL OPPORTUNITIES

In addition to the above priorities, USDA and other agencies have several existing grant and loan programs that can support visitor products industries. For example:

- The Farm Service Agency has a new Voluntary Public Access and Habitat Incentive Program (VPA-HIP)[9], the primary objective of which is to encourage owners and operators of privately-held farm, ranch, and forest land to voluntarily make that land available for access by the public for wildlife-dependent recreation, including hunting or fishing, under programs implemented by state or tribal governments. VPA-HIP is a competitive grants program authorized under Section 1240R of the Food Security Act of 1985, as amended, and is only available for states and tribal governments. Up to $50 million is available through fiscal year 2012. FSA will work with tribal government and the states to encourage participation in this program.

Improving and investing in infrastructure essential to the visitor products industry will help maintain and potentially grow this economic sector. The Forest Service has identified over $2 million in additional funding initiatives in FY12-13 in infrastructure and community initiatives. For example:

- The Tongass National Forest may be able to increase its visitor use, but the funding for the necessary research to manage this growth while sustaining and protecting ecosystems, riparian areas, and wildlife habitat is inadequate. Additional funding could allow increased capacity and, therefore, industry growth.

- The Mendenhall Glacier Visitor Center in Juneau, the Discovery Visitor Center in Ketchikan and the many bear viewing wildlife areas on the Tongass are a major part of many visitors' itineraries when they visit Southeast Alaska. The Forest Service will invest in deferred maintenance and safety upgrades at these facilities, which will improve the quality of experience for visitors.

[9] http://www.fsa.usda.gov/FSA/newsReleases?area=newsroom&subject=landing&topic=pfs&newstype=prfactsheet&type=detail&item=pf_20100708_consv_en_vpa_hip.html

***Table 7*. Summary of additional financial investments in infrastructure, maintenance, and research to support the visitor products industry across Southeast Alaska. Investments are categorized into two-year periods, and include past, projected and future investments needed to grow the industry.**

Other Investments in Support of Visitor Products in Southeast Alaska	Participants	Type of Investment	Investments Made FY10&FY11	Investments Planned FY12&FY13[10]	Recommended Funding to Increase Growth in FY12&FY13
Sustainable Recreation & Tourism Community Initiatives	USFS, City, State, Tribal, Tourism Partners	Community collaborative partnerships to support development of recreation and tourism programs and facilities	$147,900	$200,000	$225,000
Research to evaluate effectiveness of the community collaborative partnerships	USFS Research, Collaborative groups in Sitka, Wrangell, Yakutat, Juneau, Hoonah	Improve community collaborative recreation and tourism partnerships	0	0	$150,000
Visitor Center repairs and upgrades at Mendenhall Glacier Visitor Center in Juneau and Southeast Alaska Discovery Center in Ketchikan	USFS	Deferred maintenance	$2,958,400	$175,000	$800,000
Wildlife Viewing Area Maintenance - Pack Cr, Anan, Dog Salmon, Fish Cr and Margaret Cr Bear Viewing Areas	USFS, Alaska Dept. Fish & Game	Deferred maintenance and public safety improvements	$193,000	$85,000	$1,370,000
TOTAL			**$3,299,300**	**$460,000**	**$2,545,000**

USFS = Forest Service

Anan Creek Bear Viewing Platform.

[10] Investments planned with annual appropriations assuming budgets at similar levels.

While the visitor and ocean products industries are primary economic drivers in Southeast Alaska, the forest products industry remains economically and culturally significant. The Forest Products Cluster Working Group identified nine action initiatives to improve the economic viability of rural communities through investments in the forest products industry. The USDA implementation team selected five of these for initial focus.

INITIATIVE 1—Use young growth wood for cabin and recreational structures.

Starrigavan Creek Cabin made from young growth timber thinned to improve salmon habitat near Sitka. The cabin is heavily used by visitors.

Background: As part of the Transition Framework, the Tongass National Forest has committed to transitioning into young growth timber harvest as quickly as possible. Creating local markets and incentives for young growth timber will be necessary to facilitate this transition. Currently, the Forest Service, Rural Development, the City of Sitka and partners are working on a model example of utilizing local wood in the Sitka 3 to 5 School.

Action: Promote and facilitate the use of young growth timber in Southeast Alaska by demonstrating the product's value through investments in recreation projects; grading the lumber (allowing homes built with young growth to qualify for bank financing); and providing research information to support the utility of young growth wood. To achieve this goal, the Tongass National Forest committed to:

- Working with the industry and District Rangers on Prince of Wales Island to identify a young-growth cabin demonstration project that utilizes processed material and to prioritize funding for the milling and construction.
- Performing a mill study on young growth milling.
- Requesting an additional $1 million dollars in funding to construct young growth cabins in high visibility campgrounds (see Visitor Services actions).
- Working with the State of Alaska to make certified lumber grading personnel available in Southeast Alaska, expanding potential markets for value-added products.
- Making the Ketchikan Wood Technology Center's young growth structural analysis data available to the Initiative's Team in partnership with USFS research (PNW).

Lead Agency: Forest Service

Table 8. **Summary of financial investments to promote the use of young growth forest products in Southeast Alaska, supporting Forest Products Initiative 1. Investments are categorized into two year periods, and include past, projected and future investments needed to grow the industry.**

Investments to Promote Young Growth Forest Products in Southeast Alaska	Participants	Type of Investment	Investments Made FY10&FY11	Investments Planned FY12&FY13[11]	Recommended Funding to Increase Growth in FY12&FY13
Construct pre-school from second growth wood - Sitka	RD, USFS, Private Donations, Community Partners	Demonstration of use of second growth in large commercial facility	Donated staff and community partnership group	$1,100,000	0
Complete analysis and publish mechanical properties of young-growth data set	USFS Research, Contractor	Testing was completed prior to closure of Ketchikan Wood Technology Center (contract with lead researcher to complete)	0	0	$50,000
Young growth cabin demonstration projects	USFS, University of Alaska, Alaska Cooperative Extension, Friends of Tongass Cabins	Demonstration of use of Young Growth Timber and implement training program with University	$320,000	$150,000	$150,000
Construct traditional Alaska Native smoke houses	Tribes, USFS	Provide Smoke Houses to Tribes and Stimulate Interest in Alaska Value Added Products	$15,000	$15,000	$75,000
TOTAL			**$335,000**	**$1,265,000**	**$275,000**

USFS = Forest Service, RD = Rural Development

INITIATIVE 2—Simplify small timber sale process to allow small mills on Prince of Wales Island to operate more efficiently, economically, and with more consistent timber supply.

Background: Prince of Wales Island is home to over a dozen small timber mills, many of which are struggling to operate as efficiently and economically as possible. Challenges include a complicated and often cumbersome process to bid on small sales, and a perceived lack of a fair and level playing field between export and domestic processing bidders on timber sales.

Action: Provide small mill operators a more efficient, economical and stable wood supply. The working group identified seven specific steps (i.e., simplifying the small sale process to make it less cumbersome and creating a sort yard) that will help achieve this goal. If challenges with the small sale program are improved on Prince of Wales, the results could be utilized across the Tongass National Forest, similar to the Micro Sales Program expansion beyond Prince of Wales. The Tongass National Forest committed to meeting with small mill owners to further refine their needs, and to coordinate with the Alaska Regional Office to improve the program.

Lead Agency: Forest Service

[11] Investments planned with annual appropriations assuming budgets at similar levels.

INITIATIVE 3—Improve Tongass timber planning processes to provide more consistent supply

Background: The working group identified several key challenges with the Tongass timber sale program, including delivery of timber sales, special use permit processes, and the agency's ability to accept partner funds. The group recommended 10 ten steps to improve timber supply to local mills (i.e., tracking spreadsheets and accountability for product delivery), all of which are internal to the Forest Service.

Action: Provide a more predictable and consistent supply of timber (old or young growth) so the forest products industry can make appropriate investments to maintain and create jobs. The Tongass timber staff has committed to each action item to address product delivery. The staff will establish a tracking mechanism for review by the Forest Leadership Team so that product delivery issues can be identified and corrective action taken.

Lead Agency: Forest Service

INITIATIVE 4—Where feasible, substitute woody biomass for diesel to meet energy needs of Southeast Alaska.

Background: Many rural communities in Southeast Alaska are faced with increasingly expensive energy. Reducing energy costs by substituting woody biomass for diesel could both help rural communities and improve ecosystem health, particularly if the source of the wood energy is the byproduct of restoration treatments. Sealaska Corporation in Juneau recently converted to wood energy and has demonstrated significant cost savings. The Forest Service is also exploring conversion of public buildings, proposing over $20 million in investment. Challenges include ensuring a wood supply, demand, technical assistance to entrepreneurs, and financing.

Action: To catalyze the use of woody biomass in Southeast Alaska, the Forest Service and Rural Development are partnering on the following:

- Rural Development will work closely with the Goose Creek Biofuels Cooperative on Prince of Wales Island to assist in applying for and securing financing through grants and loans. The Cooperative has written a business plan for developing a local pellet production facility.

- The Thorne Bay Ranger District will work on a potential stewardship agreement to make waste wood from old landing sites available to an entrepreneur.

- The Tongass National Forest will approach Southeast Conference about sponsoring the development of a biomass energy plan for Southeast Alaska, as well as work with USDA counterparts to leverage federal funding for implementation of such a plan.

- State and Private Forestry will provide technical assistance to local entrepreneurs as needed.

Table 9. **Summary of financial investments that support Forest Products Initiative 4, catalyzing the use of woody biomass in Southeast Alaska. Investments are categorized into two year periods, and include past, projected and future investments needed to grow the industry.**

USDA Investments in Support of Woody Biomass Southeast Alaska	Participants	Type of Investment	Investments Made FY10&FY11	Investments Planned FY12&FY13[12]	Recommended Funding to Increase Growth in FY12&FY13
Biomass development planning and coordination	USFS	Fund position and jump start Forest Product Lab Wood Energy Grants Program and consultant funding to provide technical assistance	$605,000	$326,000	0
JEDC wood products development service and Alaska Wood Energy Development Task Group	RD, JEDC, USFS (S&PF, TNF, Research)	Grants, cooperative agreements, joint venture agreements, contracts for services	$280,000	$276,000	0
Construct pellet production plant on Prince of Wales Island	RD, State AEA, USFS	Utilize wood waste and reduce reliance on oil. Grants, loans; 10-year biomass contract; private investment(s)	0	0	$6,500,000[13]
Complete a wood energy					
Total			**$885,000**	**$602,000**	**$6,500,000**

USFS = Forest Service, RD = Rural Development, S&PF = State and Private Forestry, JEDC = Juneau Economic Development Council, AEA = Alaska Energy Authority, FSA = Farm Service Agency

INITIATIVE 5—Conduct a timber base analysis to determine the volume of young growth for sustaining and strengthening the forest industry in Southeast Alaska.

Background: The ability to shift the Tongass timber sale program to a program predominately focused on young growth requires a detailed and accurate understanding of the volume of young growth throughout the region. This young growth analysis would broaden existing research being conducted by the Tongass National Forest to include all young growth stands in Southeast Alaska to support the total industry, regardless of ownership.

Action: Develop an accurate analysis of young growth availability, which will provide the local forest products industry a more predictable program of work to make investments. The analysis will include harvest scheduling and growth and yield modeling to determine levels of wood products available from a variety of management approaches.

Lead Agency: Forest Service

[12] Investments planned with annual appropriations assuming budgets at similar levels.
[13] See Appendix B for details of Pellet Production Plant.

Table 10. **Summary of financial investments in young growth research, supporting Forest Products Initiative 5. Investments are categorized into two year periods, and include past, projected and future investments needed to expand the research.**

USDA Investments in Support of Young Growth Research in Southeast Alaska	Participants	Type of Investment	Investments Made FY10&FY11	Investments Planned FY12&FY13[14]	Recommended Funding to Increase Growth in FY12&FY13
All lands young-growth scenario analysis for in Southeast Alaska	USFS Research, Partners	Provides needed data on young growth industry potential in SE	$25,000	$50,000	$250,000

ADDITIONAL OPPORTUNITIES

Continued investment in old growth timber supply at the current levels is needed during this transition period. Increased funding to support second growth timber harvest is needed.

Pellets made in Alaska from native species.

[14] Investments planned with annual appropriations assuming budgets at similar levels.

Table 11. **Summary of additional financial investments in the forest products industry. Investments are categorized into two year periods, and include past, projected and future investments needed to maintain the industry and increase young growth supply.**

USDA Investments in Support of Forest Products Southeast Alaska	Participants	Type of Investment	Investments Made FY10&FY11	Investments Planned FY12&FY13[15]	Recommended Funding to Increase Growth in FY12&FY13
Timber supply to maintain existing industry: Wrangell Island EIS; Big Thorne EIS (Luck Lake/Eagle); Tonka EIS; Saddle Lakes EIS; Zarembo EIS; Thomas Bay EIS; Naukati EIS	USFS	Maintains current industry of 200 jobs, existing mills, etc. Additional funds needed to identify outyear supply	$19,900,000	$20,750,000	$5,000,000
Young growth timber supply: Kosciusko EA; Heceta EA; Tuxekan EA; Dargon Point CE; Winter Harbor 2 EA; Shrimp Bay EIS; Thomas Bay EIS; Vank Island EA	USFS	Integrated thinning projects to improve wildlife habitat	0	$500,000	$3,500,000
Stewardship pilot projects: Central Kupreanof; Big Thorne EIS (Ratz); Peril Strait	USFS	Integrated projects to accomplish multiple resource objectives. Additional funding needed to implement service contracts	$2,500,000	$1,800,000	$2,000,000
Alaska young growth marketing research	USFS Research	Determine consumer reaction to value-added Alaska young growth wood	0	0	$150,000
Alaska young growth volume tables for biomass, traditional, & specialty products	USFS Research	Support to industry to better estimate young growth product potential	0	0	$50,000
Product grade recovery studies	USFS Research	Gain understanding of value added products recoverable from young-growth material of various ages and sizes	0	0	$450,000
Young growth harvest schedule plan; YG out into the future using the FPS Model combined with the latest YG inventory data for each district would provide the information needed to schedule out YG projects	USFS, Research	Provides ranger districts specific information about young growth stands that may be scheduled for harvest using FPS model	0	0	$100,000
Total			**$22,400,000**	**$23,050,000**	**$11,250,000**

[15] Investments planned with annual appropriations assuming budgets at similar levels.

Renewable Energy

High energy costs are a large deterrent to economic growth in the communities of Southeast Alaska. The Renewable Energy Cluster Working Group identified one action initiative that is likely to receive funding in the next two years.

INITIATIVE 1—Biomass Energy Demand Development

Background: FSA administers the **Biomass Crop Assistance Program**[16] (BCAP), which provides financial assistance to owners and operators of agricultural and non-industrial private forest land who wish to establish, produce, and deliver biomass feedstocks. Matching payments may be available for the delivery of eligible material to qualified biomass conversion facilities by eligible material owners. Qualified biomass conversion facilities produce heat, power, bio-based products, or advanced biofuels from biomass feedstocks.

Action: Encouraging utilization of the BCAP program to help kick start the biomass industry in Southeast by investing additional funds that could support development of a pellet manufacturing facility.

Lead Agency: Rural Development

Wood chip boiler.

[16] http://www.fsa.usda.gov/FSA/webapp?area=home&subject=ener&topic=bcap&utm_source=spotlight&utm_medium=click&utm_content=rotation2&utm_campaign=bcapeducation

Table 12. **Summary of financial investments in renewable energy. Investments are categorized into two-year periods, and include past, projected and future investments needed to grow the industry.**

USDA Investments in Support of Renewable Energy Southeast Alaska	Participants	Type of Investment	Investments Made FY10&FY11	Investments Planned FY12&FY13[17]	Recommended Funding to Increase Growth in FY12&FY13
Authorization for Swan-Tyee Intertie and investigative permits for 5 hydro projects; Pre-licensing documents and filed detailed comments on 6 FERC hydro projects; ongoing review of 13 FERC projects; ongoing work with Tenakee Springs and Little Port Walter hydro projects (non-FERC); NEPA and special use authorization for Whitman lake; finalize post-licensing plans; finalize post-licensing documents and plans for Blue Lake hydro; Monitoring and inspection of Whitman and Blue Lake hydro construction	USFS	Renewable Hydropower	$184,000	$183,000	$260,000
Ongoing review, permitting for Neka, Bell Island geothermal projects and Tenakee Inlet study.	USFS	Geothermal	0	$25,000	$25,000
Established and filled Energy Coordinator position.	USFS	Renewable Energy	$310,000	$320,000	0
Partnering/assisting diesel-dependent community with a small hydro project that is exempt from FERC licensing—perhaps Elfin Cove (permits, NEPA, FERC exemption). Also partnering/assisting diesel-dependent community to identify a feasible energy project.	USFS,RD	USFS lead on NEPA; USDA assists communities with grants/ loan ($275,000 per community for planning)	0	0	$550,000
Convert 6 USFS Administrative Offices from Oil to Biomass	USFS	Creates demand for wood waste, reduces heating cost	$1,100,000	0	$2,450,000
Biomass Heating Conversion from Oil through Grants and Loans	RD, FSA, USFS	Create demand for 10,000 tons per year of pellets and replace 1,000,000 gallons per year of fuel oil	$650,000	$200,000	$20,000,000
Assessment of Tongass Plan to evaluate energy development barriers, including potential modifications to Forest Plan; complete after SE IRP report	USFS	Energy Planning	0	0	$70,000
Total			**$2,244,000**	**$728,000**	**$23,355,000**

USFS = Forest Service, RD = Rural Development, FSA = Farm Service Agency

[17] Investments planned with annual appropriations assuming budgets at similar levels.

How do we measure success?

Given the prevalence of public land in Southeast Alaska, improving rural community health in the region requires the deliberate linking of natural resource management agencies (i.e., USFS, State of Alaska), government service providers (RD, FSA, and others), communities, and local economic development networks. The asset mapping project has helped to create this link, and involved the public and business leaders in identifying opportunities that further the social and economic well-being of communities in Southeast Alaska. The economic cluster working groups identified numerous action initiatives that have the potential to increase prosperity, create jobs, and expand the visitor, ocean, and forest products industries. Suggestions included upgrades in infrastructure, improvements in fish and wildlife habitat, and construction of new facilities to produce and use renewable energy and biofuels. These projects and investments all have the potential to preserve the way and quality of life in rural Alaska while protecting the environment, creating higher skill and higher wage jobs, and raising income levels.

In spite of the benefits of the cluster groups and collaboration to date, the impacts of this investment strategy with respect to regional prosperity will take time to realize, and will likely be difficult to attribute to any one cause. Additionally, measures of success will be different depending on whether they are tied to a specific action initiative, or to the overall effort to improve ecological and community health in the region. Measures of success are also likely to vary by local community interests and needs. That being said, potential measures of success could include:

- Community groups develop plans of facilitating job creation and retention, and business expansion and development.
- Community groups secure additional resources/investments through Rural Development, NRCS, FSA and other public and private entities.
- Increased partnership across business sectors, government and communities.
- Increased capacity of rural entrepreneurs to access financial capital and technical assistance.
- Economic cluster groups are meeting on a regular basis. Cluster working groups have refined action plans and are moving forward with support of one or more projects.
- Community initiatives are linked and build on each other, lessons transferred, within and across communities.
- Creation of new jobs–full-time, part-time, seasonal.
- Increases in Southeast Alaska wages, income, population, and businesses.

Continued work with the cluster working groups will help to identify more opportunities, and develop collective visions for success. Additionally, the implementation team has created a work group that will identify more specific metrics of success, which will be used to monitor progress.

What are important next steps?

This Strategy reflects a new direction among USDA agencies in Southeast Alaska. This is the first time that these agencies have taken the results of a cluster work group process and begun to align USDA programs and priorities in support of the business community. It is, after all, the private sector and its entrepreneurial spirit that will create jobs and a vibrant economy in Southeast Alaska.

This document is the first attempt to identify resources to support the initiatives of the cluster groups. The cluster groups continue to meet and create new ideas and approaches to implement these initiatives. Likewise, USDA programs and funding will change. Thus, it is important to view this document as a snapshot of this moment in time and to expect to revisit and revise on a regular basis.
Collaboration among federal, state, and local governments, tribes, non-governmental organizations, and key businesses are essential to success. This is particularly true in Southeast Alaska where most of the land and resources are managed by the federal government. For example, mariculture development may require permits from the state for activities below mean high tide and permits from the Forest Service for activities above mean high tide. Obtaining such permits can be an onerous process, particularly if agencies are not working together.

Perhaps one of the most important next steps is recognition of the need to "connect the dots," linking communities, businesses, resource management agencies, and service providers to facilitate community sustainability, job creation, and rural wealth creation. Perhaps through this effort unexpected connections will emerge that will result in new possibilities and opportunities. In light of the current overall global economic conditions, this may be our best path to a brighter future in Southeast Alaska.

Important next steps include:

- Strengthening the relationships between agencies and organizations that control access to resources.
- Continuing interagency funding in support of business cluster work groups.
- Supporting entrepreneurs and communities to build capacity to implement initiatives through grants.
- Investigating ways to elevate and sustain agency support of cluster initiatives.
- Conducting an annual review of accomplishments, successes, and failures.
- Updating the USDA investment strategy on an annual basis.
- Telling the story, particularly as successes emerge.

Appendix A: Tongass Transition – RD Projects Funded in Southeast Alaska in 2010

Compiled September 28, 2010

Community	Borrower/ Applicant Name	Award Date	Agency-Program	Direct Loan Amount	Guaranteed Loan Amount	Grant Amount	Description
Wrangell	Wrangell Medical Center	new	RD-Community Facilities	$19,500,000			Construct a new hospital for the community
Ketchikan	Ketchikan Indian Corporation	new	RD-Tribal Affairs			$200,000	Purchase equipment for new Vocational-Technical School
Petersburg	City of Petersburg	new	RD-Community Facilities			$200,000	Construct and furnish new energy efficient public library
Wrangell	City of Wrangell	new	RD-Community Facilities			$67,000	Purchase automation equipment for the Public Library
Regionwide	Juneau Economic Development Council	new	USFS			$240,000	Asset mapping and regional economic planning
Wrangell	Wrangell Medical Center	new	RD-Community Facilities			$100,000	Purchase greenhouse/community garden/farmer's market
Regionwide	Juneau Economic Development Council	Sep-10	RD-Rural Business Enterprise Grant			$99,837	Woody biomass technical assistance project
Petersburg	Alaska Sustainable Wild Seafood	Aug-10	RD-Renewable Energy America Program			$20,000	Energy efficiency improvements to fishing vessel
Yakutat	Yakutat Tlingit Tribe	Jul-10	RD-Community Facilities			$250,000	Construct Community Center
Sitka	Sitka Counseling and Prevention Services	Aug-10	RD-Community Facilities	$1,256,000			Purchase leased building
Ketchikan	Ketchikan Gateway Borough	Aug-10	RD-Community Facilities			$18,000	North Tongass VFD paving of driveway
Sitka	Sheldon Jackson Child Care Center	Aug-10	RD-Community Facilities	$500,000			Purchase existing Child Care Center
Juneau	RH Rentals	Jul-10	RD-Business & Industry Loan Guarantee		$570,000		New multi-use property with apartments and self storage
Regionwide	Southeast Region EMS	Aug-10	RD-Community Facilities			$56,000	EMS equipment and vehicles
Juneau	Alaska Shellfish Growers Association	Jun-10	RD-Rural Business Enterprise Grant			$29,500	Development of an oyster-growers best practices manual
Sitka	Talon Lodge, LLC	Jun-10	RD-Business & Industry Loan Guarantee		$1,840,000		Working capital and debt restructure
Kake	Rural Community Assistance Corp.	Jun-10	RD-Rural Business Enterprise Grant		$99,956		Geoduck nursery and mariculture technical assistance
Metlakatla	Metlakatla Indian Community Housing Authority	Jun-10	RD-Housing Preservation Grant			$53,605	Repair and weatherize 10 elder homes

Juneau	Vision Alaska II LLC	May-10	RD-Business & Industry Loan Guarantee		$1,111,111		Purchase of existing television station
Juneau	R&S Rentals	Apr-10	RD-Business & Industry Loan Guarantee		$1,161,500		New multi-use property with apartments and self storage
Ketchikan	Ketchikan Gateway Borough	Apr-10	RD-Rural Business Enterprise Grant			$99,000	Establish a revolving loan fund
Petersburg	FV Redemption, LLC	Apr-10	RD-Business & Industry Loan Guarantee		$1,100,000		New fishing vessel construction
Total Funded CP/BP	$21,256,000	$5,782,611	$3,238,698	Community and Business Programs - $30,277,309			
			Single Family Housing Loans	$4,477,858	$4,046,358	$7,500	
			Mutli-Family Housing Rent Subsidies			$1,623,028	Housing Programs - $10,154,742
			Grand Total Program-Wide 2010 for Southeast Alaska	**$25,733,856**	**$9,828,969**	**$4,869,226**	**$40,432,051**

Appendix B. Parameters of Sustainable Pellet Manufacturing Plant in Southeast Alaska

By Daniel Parrent, State & Private Forestry

For this discussion—the viability of as sustainable pellet manufacturing plant in Southeast Alaska, it is assumed that:

1. The desired outcome is the installation and operation of a sustainable (i.e., profitable) pellet manufacturing plant(s) in Southeast Alaska.

2. The average green wood moisture content, including sawmill residuals, will be approximately 50%, and that one ton of green feedstock will produce approximately 1,000 pounds of pellets. (NOTE: an additional quantity of wood (20 to 30 percent) will be required as fuel for a feedstock dryer.)

SCALE

What is a sustainable pellet manufacturing plant? Some contend that, at a minimum, a pellet plant would have to produce 25 to 30 thousand tons of pellets annually to be viable. Under certain circumstances, that may be true. However, circumstances in Southeast Alaska are not necessarily the same as those found in the Lower 48. Given Alaska's higher manufacturing, utility, labor and transportation costs, it is unlikely that an Alaska pellet manufacturer would be able to compete with Continental U.S. and Canadian producers in North American, European or Asian markets. The home for Alaska-made pellets is Alaska.

A viable pellet manufacturing operation in Southeast Alaska would have to produce a minimum of 10,000 tons per year (using sawmill residuals as a primary source of furnish) to break-even or be minimally profitable. Operating one-shift 50 weeks per year would mean producing 5 tons per hour.

In terms of fuel oil displacement, 10,000 tons of pellets would be roughly equivalent to about 1 million gallons of fuel oil. The current, non-residential demand for pellets is about 300 tons per year (Sealaska Corp., Juneau office building).

DEVELOPING DEMAND

A number of preliminary facility assessments have already been conducted. In addition, some gross estimates of non-residential fuel consumption have been compiled. A preliminary estimate, which is NOT very inclusive, exceeds 3 million gallons, half of which is the Coast Guard Station in Kodiak. However, total heating oil consumption in Juneau alone (all users: residential, institutional, industrial, etc) is roughly 11 million gallons annually. More information is presented in the table below.

If all the businesses listed in the table were to convert to pellet fuel, regional demand for pellets would rise to over 33 thousand tons per year. This would be enough to support a small pellet facility. Alternatively, if one quarter of residential consumers of heating oil in Juneau were to convert to pellet fuel, the supply from a small pellet plant would meet demand.

Potential for biomass heating systems at large energy-using facilities in Southeast Alaska

Facility ID	Community	Fuel oil consumption (gal/yr)
Hames PE Center	Sitka	51,000
US Coast Guard (Air Station Sitka)	Sitka	140,000
SEARHC (hospital only)	Sitka	131,100
SEARHC (non-hospital)	Sitka	33,300
Sitka High School	Sitka	65,700
Blatchley Middle School	Sitka	40,150
Keet Gooshi Heen Elem. School	Sitka	27,000
Baranof Elementary School	Sitka	27,600
Pacific High School	Sitka	4,300
Sitka Airport	Sitka	20,400
Sitka Animal Shelter	Sitka	3,300
Centennial Hall	Sitka	8,700
Sitka Fire Hall	Sitka	9,200
Sitka Public Library	Sitka	4,000
Sitka Public Services Center	Sitka	8,300
Sitka Community Hospital	Sitka	68,000
Waste Water Treatment Plant	Sitka	13,000
Sawmill Cove Admin Bldg	Sitka	9,000
Mt Edgecombe High School	Sitka	142,300
University of Alaska SE, Sitka	Sitka	10,500
Haines Schools and city buildings	Haines	60,000
Klawock School	Klawock	14,000
Coffman Cove municipal building (if built)	Coffman Cove	6,200
USFS Discovery & Visitors Center	Ketchikan	20,000
Klukwan Heritage Center (if built)	Klukwan	3,000
Coffman Cove School	Coffman Cove	10,000
Kake Community Center	Kake	10,250
Kake School	Kake	20,000
Hoonah School/pool/gym	Hoonah	50,000
US Coast Guard (Ketchikan base)	Ketchikan	130,000
US Coast Guard (Kodiak)	Kodiak	1,500,000
Willoughby District heating (if built)	Juneau	660,000
	TOTAL	**3,300,300**

Appendix C. Additional Rural Development Investments

Access to affordable housing is directly related to economic development, particularly in rural communities. Affordable housing continues to be of high concern for many communities in the region. Rural Development's housing programs fit a certain income category of household income, for example "moderate," "low," and "very low" income coupled with household size. Rural Development can subsidize direct loans at interest rates as low as 1%, based on income/family size calculations. In Sitka, for example, entry level teachers, and other midlevel professionals qualify for the direct loan and loan guarantee program for Single Family Housing. By providing rental assistance to qualifying families, this program helps individuals and families remain in adequate housing.

Two-Year Estimate of Program Investment

Business Programs – 2 year projected investment		**$14,248,913**
Business and Industry Loan Guarantees	$13,648,164	
Grants to facilitate Business Development	$ 600,749	
Housing Programs – 2 year projected investment		**$12,307,820**
Single Family Guaranteed Loans	$ 6,848,834	
Single Family Direct Loans (Low)	$ 1,114,624	
Single Family Direct Loans (Very Low)	$ 2,615,204	
Home Improvement Loans	$ 18,088	
Home Improvement Grants	$ 7,650	
Multi-Family Housing Rental Assistance	$ 1,703,420	
Community Programs – 2 year projected investment		**$11,113,652**
Community Facilities Direct Loans	$ 7,140,000	
Community Facilities Guaranteed Loans	$ 68,000	
Community Facilities Grants	$ 1,088,052	
Water/Environmental Loans/Grants	$ 2,817,600	
Rural Utilities Service	?	
Total Projected Investment - next 2 Years		**$37,670,385**

Appendix D. Energy Projects that have Received Initial or Additional Funding in the Capital Budget

By Barbara A. Stanley, Energy Coordinator, Alaska Region, USDA Forest Service

Admiralty National Monument

- Thayer Lake Hydro: Kootznoowoo received $1,060,500 for permitting and final design from the Alaska Renewable Energy Fund.

Juneau Ranger District

- Snettisham Transmission Line Avalanche Mitigation: AEL&P received $2.0 million for design and construction from the Alaska Renewable Energy Fund.
- Connelly Lake Hydro: AP&T received $468,000 for reconn/feasibility from the Alaska Renewable Energy Fund. (not NFS lands)
- Schubee Lake Hydro: AP&T received $80,000 for reconn/feasibility from the Alaska Renewable Energy Fund.
- Excursion Inlet Hydro: Haines Borough received $93,593 for reconn/feasibility. Funded through Alaska Renewable Energy Fund.

Hoonah Ranger District

- Elfin Cove Hydro: Community of Elfin Cove Utility Commission received $347,000 for permitting/final design. No paperwork has been submitted to FERC; may qualify for FERC exemption. Funded through Alaska Renewable Energy Fund.
- Pelican Hydro Upgrade: City of Pelican received $1,896,836 for construction. Funded through Alaska Renewable Energy Fund. . (not NFS lands)
- Sitka Ranger District
- Indian River Hydro: City of Tenakee Springs Electric Department received $203,000 for permitting/final design. (Not NFS lands but will affect USFS fishpass.) Funded through Alaska Renewable Energy Fund.
- Reconnaissance Study of Tenakee Inlet Geothermal Resources: IPEC received $589,200 for reconn/feasibility.
- Blue Lake Hydro: City & Borough of Sitka received an appropriation of $28.5 million for construction.

Ketchikan-Misty Fiords Ranger District

- Metlakatla-Ketchikan Intertie: Metlakatla Indian Community received $1.18 million for permitting/design/construction. Not expected to impact NFS lands. Funded through Alaska Renewable Energy Fund.
- Whitman Lake Hydro: City of Ketchikan received an appropriation of $8.25 million for construction and also received $700,000 for construction from the Alaska Renewable Energy Fund.

Craig Ranger District

- Biomass Fuel Dryer: City of Craig received $350,000 for construction. Funded through Alaska Renewable Energy Fund.
- Reynolds Creek Hydro Transmission: Alaska Power Company received $2.0 million for construction. Not expected to impact NFS lands. Funded through Alaska Renewable Energy Fund.

Appendix E:
OceansAlaska Mariculture Research, Training & Development Facility

Mission

The OceansAlaska Mariculture Facility will facilitate the emergence of a mariculture industry by providing respected research, development, demonstration and training. Alaska can have a strong and sustainable shellfish mariculture industry that creates vibrant coastal communities.

Potential for Shellfish Mariculture in Alaska

Shellfish Mariculture in Southeast Alaska has the potential to provide direct and indirect jobs, providing a sustainable industry and taking advantage of Alaska's clean waters and miles of coastline. All other successful shellfish mariculture areas in the world have been led by research and development activities that provide the innovation and incentive to create investment and private sector jobs. Alaska shellfish mariculture has the potential to create a strong, healthy shellfish industry that will generate 200-300 new economically and environmentally sustainable year-round jobs and expand to a $50 million a year industry in 20 years by overcoming barriers to development.

For instance, Yakutat has plans to create 36 oyster farmers in the next few years- all of which need the training and expertise that OceansAlaska can provide. The dive fisheries in Southeast Alaska went from a nascent industry to an $8-9 million industry employing more than 200 divers in the past 10-12 years. Hundreds of cannery workers, fuel, transport, grocery and other interrelated industries have benefited, keeping jobs in Southeast Alaska through the winter time. Over 70% of the expenditures of small shellfish farms are spent within 20 – 30 miles of the farm site. There is untapped potential to expand these businesses and provide year-round jobs in struggling coastal communities.

Plagued by a decline in employment and followed by a declining population, all but one Southeast community has lost population in the last 10 years. The Alaska Native villages have been hit especially hard. Populations have declined as much as 50% in the last 15 years as residents move to larger towns in search of paying employment. Mariculture (of oysters, geoducks, mussels, seaweeds, etc.) is a realistically accessible solution to this economic decline. There is increasing worldwide demand for the products, especially from Asia, and all long-term projections for demand is strong- the U.S. market for shellfish alone estimated to increase from 11 to 14.3 billion pounds by 2020. More interest and participation is needed in Southeast Alaska to make this industry an important part of the regional economy.

All Southeast Alaska communities are located on the water, and most of the people in the smaller communities are already reliant on the ocean for much of their sustenance. They are boat users, fishermen, construction workers, and entrepreneurs who already possess many of the skills needed to grow shellfish or other marine products. This is perhaps particularly important in the many villages which are predominantly made up of Alaska Natives. Much effort will be required to inform our residents of the opportunities at their very doorstep, and to train them to use their skills and the local environment to their benefit. There are several ways that OceansAlaska will grow this industry- including providing a stable seed supply, identifying species suitable for local grow out, researching and teaching best-practice methods of grow out, and training new entrants in farm planning, permitting, biological processes, and entry programs. Ongoing outreach, training and mentorship are essential; most people in the region unaware of the opportunities or unsure how to begin a mariculture business. Only then will sustainable jobs be created- jobs that are dependent on Alaskan resources that few places in the world possess- clean and nutritious ocean water and an entrepreneurial mentality.

Organization

OceansAlaska is a 501c3 non-profit with nine (9) Board of Directors (See http://www.oceansalaska.org/oa2/pages/staff_board_contacts.html for details), all located in Ketchikan, Alaska. The Mariculture

Advisory Council is a 15-member body made up of shellfish growers and harvesters, researchers, educators, native corporations, and industry representatives throughout Alaska. David Mitchel, General Manager, Tom Henderson, Mariculture Director, and Susan Round, Accounts Manager, are staff for OceansAlaska.

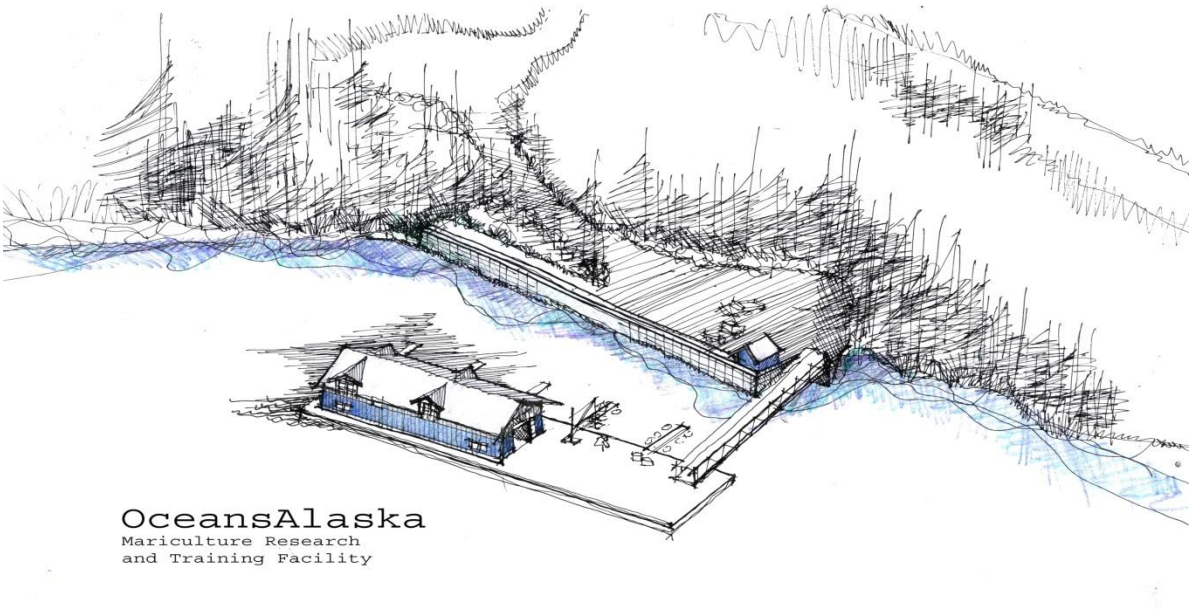
Facility Description

The State of Alaska provided OceansAlaska, through the Ketchikan Gateway Borough, with approximately 28 acres of uplands and tidelands and 24 acres of subtidal. The access road and site pad have been developed, utilities are completed, and permitting is complete. Two contractors, BAM and Western Dock & Bridge, were awarded contracts totaling more than $2.8 million to complete the site work, utilities, ramp, dock and building. Construction is to be completed by August, 2011.

The Mariculture Research, Training & Development Facility will be a 120' x 40' concrete float with a 70'x24' building on the float, accessible by an aluminum ramp. The building has metal siding and roofing, with the interior fiberglass reinforced panels and sealed fixtures, and surface mounted plumbing and wiring for flexibility of use. The space is equipped with power, salt water, potable water, and plumbing fixtures. The building will contain a setting facility, algae tanks, wet lab, processing area, sorting facilities, dry lab, hoist, office, mariculture library, training room, and grow-out space.

Access road and site pad- prior to completion, May 2010

Sketch of completed facility



Strategic Direction

There are critical industry needs that OceansAlaska can play a role in overcoming:

1) **Research and Development:** OceansAlaska will develop and disseminate scientific and technical information of value to the public, shellfish farmers and public officials.

2) **Education and Training:** Provide quality education, training and outreach to existing owners, entrepreneurs and employees involved, or wishing to be involved, in the industry.

3) **Demonstration:** Build operational facilities for growing, harvesting and processing shellfish.

4) **Technology Transfer/Best Practices:** Provide a platform to test various methods for growth and harvest of shellfish and other applicable mariculture species.

Initial Projects and Programs

OceansAlaska will begin operations with multiple initiatives aimed at directly expanding the output of geoduck and oysters.

- **Shellfish Setting Facility**: Inconsistent and poor seed supply has been a major barrier in the development of mariculture in Alaska, and this will alleviate those concerns by producing a consistent supply of oyster and geoduck seed from the larval stage to a size suitable for nurseries. Sealaska and other major buyers of seed have agreed to commit to buying from OceansAlaska to guarantee seed supply for their operations.

- **Geoduck Nursery:** Working in cooperation with industry, a geoduck nursery grow-out facility will produce the geoducks the needed size for planting on farm sites. Seward's Aluutiq Hatchery will transfer the seed from the larval stage to the setting facility and then to the nursery to enable the clams to reach a plantable size in a cost-effective system.

- **Mariculture Research:** The OceansAlaska Mariculture Director will research the best systems and techniques of rearing for local conditions. Sea Cucumbers, scallops, mussels, seaweed, kelp, as well as oyster and geoduck research will be initiated at OceansAlaska.

- **Oyster Nursery & Entry Program:** Following the successful model of getting beginning oyster farmers into the business, an oyster FLUPSY and Farmer Access Program will allow trainees to grow their spat while going through training, financing and permitting process.

- **Outreach &Training:** Interest must be generated within the Southeast communities to increase participation in mariculture. The OceansAlaska Mariculture Director will provide ongoing assistance to new entrants throughout Alaska. Classroom training in basic marine biology, business operation, onsite mariculture training with supervision and mentoring. Working in conjunction with the University of Alaska system and the shellfish industry, OceansAlaska will provide hands-on training and demonstration of oyster farming, as well as classroom education to provide comprehensive biological understanding of oyster farming.

- **Operational Training:** OceansAlaska will provide resources and assistance in business planning, site selection, raft construction, and assistance in permitting and other barriers to entry for beginning farmers. USDA FSA loans, possible State of Alaska mariculture loans, and other business loan application assistance will be provided.

- **Resource Hub:** OceansAlaska will collect and disseminate information from other mariculture organizations, research institutes, universities, and industry. For example, the Alaska Sea Grant Marine Advisory Program's Aquaculture Specialist and Canada's Center for Shellfish Research have vast research and project information available for dissemination to interested farmers. Potential entrants will be able to learn everything they need to know at OceansAlaska, as well as have on-line access.

These projects and programs will begin in the first year of operation at the OceansAlaska facility. The Mariculture Advisory Council will use a priority-setting process to determine further research, development and training projects that OceansAlaska will conduct. **Industry involvement** in all aspects of project development is critical to the success of OceansAlaska, and ensuring funding of projects will directly affect commercial mariculture and benefit coastal Alaska.

OceansAlaska recently hired Tom Henderson as the Mariculture Director for the facility. Tom brings a wealth of experience as an oyster farmer in Southeast Alaska, salmon hatchery manager, trainer for oyster farming apprentices, and participant in Mariculture research and development experiments. Tom has over 15 years of experience with shellfish mariculture and a lifetime of aquaculture and farming experience, and can provide direct assistance and in-depth understanding of farming operations to existing, new or prospective farmers. Assistance in designing and building grow-out rafts, FLUPSYs, and other equipment necessary for operations can be provided through training. OceansAlaska can also provide business insight and best practices for species care, transportation and processing issues, lease site selection, regulatory hurdles, and business practices. This training will be instrumental in allowing people to expand or begin new successful businesses. All OceansAlaska operations will be managed by Tom, and he has already begun training and outreach as a pilot project in Yakutat and Angoon in collaboration with Sealaska.

Funding

The facility is necessary to begin nursery, research, training and development initiatives. State of Alaska funding and land, Economic Development Administration funds, Housing and Urban Development funds and local grants have all contributed to the project. A recent State of Alaska grant will help fund the essential beginning equipment needs, but operational costs remain a priority, as does a heat exchanger that would save on long-term utility costs. Public investment in OceansAlaska and the mariculture industry is essential to its success, and a critically important approach to promote economic development in coastal Alaska.

Equipment

Electrical costs are projected to increase in Ketchikan and the facility expected to use a substantial amount of energy heating water for the setting facility and nursery operations. A Marine Heat Exchanger is being researched and scoped by engineers to see its viability in dramatically reducing the heating costs. It is projected to cost $75,000 and will save OceansAlaska in long-term utility costs. OceansAlaska sits on the ocean, fittingly, and is an ideal location and use for this technology.

Annual Operations Budget

These projected costs include a fully operation oyster entry program, and up to 25 trainees requiring travel, supplies, and use of the facility.

Wages	**Total**
Mariculture Director	$57,600
General Manager	$66,000
Bookkeeper/ Accts	$7,500
Internship	$7,500
Compensation/Benefits	$20,976
Subtotal Wages	$159,576
Other Expenses	
Outreach &Dissemination	$4,800
Research Supplies	$10,800
Utilities	$29,000
Maintenence & Repair	$18,000
Travel & Conf.	$48,000
Dues & Subscriptions	$1,080
Office Equip. &Supplies	$1,800
Permits, Licenses	$10,011
Insurance, Legal	$33,600
Misc.	$15,709
Subtotal other expenses	$172,800
Total Expenses	$332,376

The Ketchikan Gateway Borough has expressed interest in promoting and supporting economic development through OceansAlaska. Geoduck growers, Southeast Alaska Regional Dive Fisheries (SARDFA), and other industry groups have expressed interest in paying for projects to be conducted at the facility. Sealaska, trainees and other users will pay a fee for services provided and help operational costs in first years, with the long-term goal for the operations to be sustained by private investment in the facility. Other public sources of funding will be pursued until private industry can sustain operational costs and for programs and research projects, estimated to be at 100% in 5-7 years.

Government Support

We have a great opportunity to create a strong, viable locally based industry in coastal communities in Alaska through the development of a shellfish industry. It will be driven by individual's investing capital and time on the farm. What is the public policy that will attract individuals to make this investment?

Investment in research, training, and development that can foster entrepreneurial activity is a critical role the government can provide. It can also overcome one major barrier to entry in a new industry but creating loan programs and making money available to those individuals willing to take a risk in a new industry.

One prevailing factor is the common property ownership of the land, water and animals by the State of Alaska or the Federal government. In Alaska the private sector cannot begin to invest or create viable shellfish industry without permission of the government. This level of common property ownership and control of the water and land creates a different type of hurdle and business risk. There are many activities and policies that can be adopted by the government that reduce the risk or improve the chances for a private individual farm to succeed. Expediting the permitting process, making small parcels of land available for mariculture farmers in remote locations, fully funding the permitting agencies, and providing programs and processes that make it easier for new entrants to navigate the government are examples of policies that can lead to increased economic growth in Alaska.

How to move into a new economic base in Southeast Alaska and through- out rural Alaska is a major challenge with most of the land base owned by the Federal Government. Any activity has to pass through the Federal legal process that involves all of the stakeholders, including those who do not live in Alaska. It takes participation of the owners of the land and water. Without understanding and support from the Federal, State and third party interest it is nearly impossible for small businesses and enterprises to operate in Alaska.

Conclusion

There is little doubt that Alaska has more potential undeveloped sites for shellfish mariculture than the rest of the United States combined, providing the opportunity for siting hundreds of shellfish farms. Removal of constraints and proper public investment and assistance can cause a snowball effect of new farmers into the industry. The U.S. market for shellfish alone is estimated to increase from 11 to 14.3 billion pounds by 2020, as the overall worldwide demand for seafood grows steadily. The estimated shellfish industry in Alaska could grow to $50M with a sustained and coordinated research, training and development effort. With superior water quality, marketable product, and steady prices, mariculture can provide sustainable jobs into the future.

Industry has identified the facility's operations as a main constraint in advancing shellfish Mariculture as outlined in the OceansAlaska report Tipping the Balance, and the community of Ketchikan has put the project as a top overall priority (#6), and critical for economic development. OceansAlaska is focused on removing the constraints to mariculture development in Alaska. The Mariculture Research, Training and Development Facility signifies a critical step in providing mariculture jobs for coastal Alaskan communities.

Endorsements (*Provided upon Request)*

Memorandums of Understanding

- Ketchikan Gateway Borough
- University of Alaska Southeast
- Sealaska Corporation, Central Council of Tlinget & Haida Indian Tribes of Alaska, Shaan Seet, Inc., Organized Village of Kake, Yak-Tat Kwaan.
- Ketchikan Indian Community
- Shellfish Growers Co-op

Resolutions

- Southeast Conference
- Ketchikan Chamber of Commerce
- Ketchikan Gateway Borough
- Ketchikan Visitors Bureau

Letters of Support

- Ketchikan Gateway Borough
- City of Ketchikan
- Greater Ketchikan Chamber of Commerce
- Southeast Conference
- Alaska Department of Fish & Game
- Sea Grant Marine Advisory Board

Contact Information

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Questions from Mr. Quigley:

Maintenance Backlog

Quigley Q1: What is the forest service's road maintenance backlog for the National Forest System nationally? In Utah? In Alaska?

Answer: The current Forest Service road maintenance backlog as discussed in the FY 2020 Congressional Justification is $3.4 billion, including road bridges, on our passenger car network. In Utah, the backlog is $112 million, and in Alaska the road maintenance backlog is $68 million.

Quigley Q2: As you know the State of Alaska and State of Utah have both asked your agency to rewrite one of the most important conservation rules in our country-the "Roadless Rule". They have effectively asked you to roll it back within their states. Nationally, the road maintenance backlog has been estimated to be about $3.2 billion. How can the Forest Service justify building new roads, which is an almost certain result from roadless state specific rulemakings, when it can't afford the ones it has?

Answer: The 2001 Roadless Rule establishes prohibitions on road construction, road reconstruction, and timber harvesting. While those prohibitions may change in a state-specific roadless rule, it does not necessarily mean that new roads would be constructed. Any proposed new road construction project would be subject to NEPA analysis, which would establish a project-specific justification for the new road and evaluate the environmental effects of the proposed project and consider alternatives.

Rulemaking Priorities/Rationale

Quigley Q3: What criteria does the USDA consider when reviewing a petition for a rulemaking?

Answer: In accordance with 7 CFR 1.28, the Secretary responds to petitions in a timely manner and considers each petition on its own merits.

Quigley Q4: My understanding is that 100% of the projects proposed in roadless areas in Alaska, at least 54 in total, have been approved. Is that correct? This includes renewable energy development projects, mining projects, utility projects, among various other types of projects, right? Isn't that also correct for Utah? And on average, how long has it taken to approve these projects? You recently delegated authority to approve these projects to the regional foresters in order to be even more responsive to local concerns and to speed up the approval process, right?

Answer: All 58 applications submitted for projects in Alaska roadless areas have been approved. The majority of them pertain to surface exploration of potential mining and hydropower. Recently approved projects in Utah pertain to mining and road realignments. On October 24, 2018 Chief Christensen delegated authority for all exceptions to the Regional Foresters in an effort to better support agency decision-making. Projects within Alaska and Utah under the

delegated authority of the Regional Forester generally take one to three weeks for approval. Projects that previously required approval from the Chief took from one to three months for approval.

Quigley Q5: What actions will the USDA take if the rationale in a petition for a rulemaking is not justified?

Answer: In accordance with 7 CFR 1.28, the Secretary will notify petitioners promptly of any decisions regarding a petition.

Quigley Q6: The Forest Service spent years and countless agency resources to adopt a forest plan for the Tongass in 2016 that transitions away from old-growth logging, and focuses on a young-growth model. How is rolling back the Roadless Rule to allow thousands of acres of old-growth forest to be logged in line with that commitment?

Answer: The 2001 Roadless Rule establishes prohibitions on road construction, road reconstruction, and timber harvesting. While those prohibitions may change in a state-specific roadless rule, it does not necessarily mean that additional old growth harvesting would occur. The 2016 Forest Plan establishes the transition from an old-growth timber program to a predominantly young-growth timber program. That transition will not be affected by a state-specific roadless rule. Any proposed project would be subject to NEPA analysis, which would evaluate the environmental effects of the proposed project and consider alternatives.

Cost of Rulemakings

Quigley Q7: We understand that the early estimates put the cost the Alaska rulemaking between $5-6 million and the potential Utah rulemaking between $3-4 million. Given the myriad responsibilities, backlogged work, and budget challenges of the Forest Service, how does the agency justify spending considerable staff time and nearly $10 million on undertaking state-based exceptions to the Roadless Area Conservation Rule?

Answer: The Roadless Rule recognizes the need for state-specific solutions to meet the intent of the Rule. These actions follow in the spirit of the Roadless Rule and are designed to meet state-specific needs. Rule-making and regulation development are normal activities of the Forest Service. Costs associated with any rule-making are inherent to the agency's budget and function.

Quigley Q8: From which appropriated accounts are these staff and other resources being taken?

Answer: The Roadless Rule analyses are primarily funded by allocations from the Land Management Planning, Inventory, and Monitoring account, with lesser allocations from timber and vegetation management funds.

Quigley Q9: What work is not getting done in order to process these state exception rules?

Answer: Some regional and forest-level planning work has been delayed in order to pay for these efforts.

Quigley Q10: What is the estimated cost of additional roadbuilding, which is likely to occur under state rules?

Answer: We cannot answer that question with the information that we have available at this time.

Quigley Q11: Given that the last Tongass Roadless rulemaking was declared invalid in federal district court in a decision it unsuccessfully appealed all the way to the U.S. Supreme Court, where the Court left the lower court rulings in place. Please estimate for the hearing record total federal expenditures, including all staff time, for defending a new Tongass Roadless Rule in court up to the Supreme Court and explain what the agency's priority uses would be for a supplemental appropriation in that amount that was not spend on judicial proceedings.

Answer: In 2011, a federal court set aside the rulemaking that temporarily exempted the Tongass National Forest from the 2001 Roadless Area Conservation Rule. The Alaska District Court's ruling was initially reversed by a three-judge panel of the Ninth Circuit, but the District Court's ruling was ultimately upheld in a 6–5 en banc ruling in 2015. The Supreme Court declined to review the *en banc* decision in 2016. USDA did not appeal the adverse ruling of the District Court and did not participate in appellate briefing in the Ninth Circuit. In 2016 the Department of Justice, on USDA's behalf, filed a motion opposing review of the Ninth Circuit's *en banc* ruling by the Supreme Court. Due to varying complexity and duration of individual cases, USDA does not have an estimate of the costs associated with defending a new Tongass Roadless Rule.

Economic Balance in Tongass

Quigley Q12: How much did the Forest Service spend in 2018 and in the previous 5, 10, 20 year period on managing timber sales in the Tongass? How much did the Forest Service spend on other priorities in those same time periods, such as stream restoration, recreation, tourism?

Answer: In FY 2018, direct support for the Tongass National Forest timber sale program was $6.3 million, including primary timber management (NFTM) and engineering (CMRD) budget line items (BLIs). Direct support figures are based on average historical direct costs to plan, prepare, offer, award, and administer timber sales on the Tongass National Forest. The analysis of direct support for the timber sale program excludes costs for the Regional Office and Supervisor's Office program management, operations support, pre-NEPA activities, facilities maintenance, travel, training, and fleet not related to producing timber outputs and generic supply costs. The total FY 2018 allocations to the Tongass National Forest for primary timber management (NFTM) and engineering (CMRD) budget line items were $10,746,320 and $6,321,381 respectively.

Annual data are available from FY 2010 through FY 2018 due to records retention requirements. The average annual total allocation for this period was $11,134,000 for timber program management, of which $6,047,000 was direct support to the timber sale program. For the same time period, the average annual total allocation for engineering support was $6,893,000, of which $1,696,000 was incurred for direct support to the timber sale program.

Timber Program Allocations with Engineering Support:				
Fiscal Year	Primary Timber Management allocation (BLI NFTM)	Portion of NFTM, direct support to timber sale program	Primary Engineering allocation (BLI CMRD)	Portion of CMRD, direct support to timber sale program
2018	$10,746,320	$4,920,000	$6,321,381	$1,380,000
2010-2018 Average	$11,134,497	$6,046,361	$6,893,331	$1,695,931

The Forest Service manages for multiple uses on the Tongass National Forest, including restoration, recreation, and tourism. BLIs to support these priorities include Wildlife and Fisheries (NFWF), Recreation and Wilderness (NFRW), and Trails (CMTL), which are the primary program areas for restoration and recreation management. These include activities that support the tourism industry. The FY 2018 final allocations and the average annual allocation for the period for FYs 2010-2018 are as follows:

Tongass National Forest Allocations for Wildlife and Fisheries, and Recreation (not including facilities)			
Fiscal Year	Wildlife and Fisheries (NFWF)	Recreation and Wilderness (NFRW)	Trails (CMTL)
2018	$4,169,281	$3,663,383	$1,650,300
2010-2018 Average	$4,296,850	$3,839,984	$1,398,256

Significant restoration activities are also implemented through partnerships and contracts which are not represented in the allocation chart above. In addition to appropriated funding, the Tongass National Forest reinvests recreation fee revenues into programs of work which support recreational uses of the forest, which includes support of tourism.

Quigley Q13: For how much did the timber sell for over these same time periods?

Answer: The available summary data available for the years 2012 through 2018 are displayed below, including total thousand board feet (MBF) and the award value.

Summary FY12-FY18			
Fiscal Year	# of sales	Total MBF	Total award value
2012	37	52,483	1,506,780
2013	38	15,866	266,002
2014	46	105,523	8,151,762

Summary FY12-FY18			
Fiscal Year	# of sales	Total MBF	Total award value
2015	45	22,625	2,072,083
2016	42	13,535	344,622
2017	45	30,808	1,021,291
2018	48	9,211	1,203,853
Average or Total	43	250,051	14,566,392

Quigley Q14: How many sales received no bids and went unsold?

Answer: In 2018, there was one large sale on the Tongass National Forest which received no bids and it has not been resold. For the period between 2012 and 2017, an average of 1 to 2 small sales per year on the Tongass National Forest received no bids and those sales were subsequently reoffered and awarded. There were no 'No Bid' sales in 2010 or 2011. The period between 2005 and 2009 experienced a higher incidence of 'No Bid' sales and those, for the most part, have been reoffered, sold, awarded, and completed. Market conditions during the 2005 to 2009 period were particularly challenging.

Quigley Q15: In a report in Northwest Science in 1998, federal fisheries experts Dr. Fred Everest and Dr. Buck Bryant described retaining the existing intact, roadless watersheds and wilderness areas of the Tongass as a "key element" in sustaining the region's extraordinary salmon runs which support unmatched commercial, subsistence, and recreational fisheries, and thus the economy of Southeast Alaska. Does the Forest Service now dispute that finding?"

Answer: The Forest Service does not dispute the finding. The Tongass National Forest Land Management Plan recognizes that the Forest is a productive landscape which sustains robust fish stocks for subsistence, commercial, and sport fisheries as well as supports traditional and cultural values. Maintaining the habitat diversity and connections among watersheds is essential to the continued productivity of the Forest's salmon fisheries. Irrespective of land status, the Forest Service manages the landscape consistent with the conservation provisions outlined within the 2016 Forest Plan to maintain and improve fish habitat.

Quigley Q16: Given the losses sustained by the American taxpayer on Tongass timber sales, would it numerically make more sense for the taxpayer to simply buy out the salaries of the timber workers and forego the logging or pay to transition these individuals into other jobs such as building and maintaining additional recreation sites?

Answer: There are many policy factors involved in this question, so the Forest Service cannot reasonably speculate on an answer.

Quigley Q17: Even in roaded portions of the Tongass, the Forest Service is paying millions for timber sale related road construction. Assuming portions of Tongass roadless areas are opened

up to timber sales and logging road construction under a new roadless rule, please provide an upper bound estimate of what the agency could incur in added road construction costs in those areas over the next decade. If appropriate, please indicate how that figure differs among alternatives under consideration in the Tongass rulemaking.

Answer: We cannot answer that question with the information that we have available at this time.

Restoration

Quigley Q18: What portion of the USFS budget is directly or indirectly associated with offering public trees for sale, as lumber or biomass, to logging companies, without regard to the USFS's claimed reasons or justifications for such sales?

Answer: The FY 2020 President's Budget proposes $375 million for Forest Products, which is 7.3 percent of the total discretionary budget and an increase of $7 million over the 2019 enacted level. This program conducts the sale and disposal of National Forest System timber.

Quigley Q19: Given the need to significantly reduce fire risk on million acres across the West, what percent of this need is the proposed budget expected to accomplish in 2020?

Answer: The FY 2020 President's Budget proposes $450 million for Hazardous Fuels, an increase of $15 million over the 2019 enacted level. With this funding, the agency aims to reduce hazardous fuels on 3.4 million acres in 2020, working with state partners to prioritize investments in places where the greatest wildfire risk exists and where fuels treatments have a high probability of reducing that risk.

Quigley Q20: At current budget levels, coupled with changing climate and continuous growth of small understory trees, how many years would it take to address the backlog of needed restoration at current budgets? Are you even keeping pace with the problem?

Answer: The Forest Service is committed to working with partners to increase active management and treat larger landscapes. Through a shared stewardship framework, the agency will work with States to jointly prioritize investments where they will be the most effective. The agency will put any funds appropriated by Congress, along with tools and authorities in place, to good use in order to improve the condition of the national forests and grasslands.

Quigley Q21: I see that the agency has retired the use of watershed conditions as a Key Performance Indicator. Just last week your agency posted on its official Twitter account that in the United States approximately 180 million people in more than 68,000 communities rely on forested lands to capture and filter their drinking water. Given that nearly one-fifth of the nation's water supply originates from national forests, and quality water is arguably our most precious and at-risk resource, how does the agency justify dropping watershed conditions as a Key Performance Indicator? Can you describe in specific terms how this budget proposal

provides accounts for investments in watershed, wildlife habitat and recreation values, given the emphasis on timber and fuels?

Answer: USDA works closely with the Forest Service to determine which agency performance measures are suitable for a Departmental-level Key Performance Indicator. The Forest Service continues to track a broader suite of measures internally that align with major program activities, including percent of watersheds in properly functioning condition (see page 145 of the agency's 2020 Congressional Budget Justification).

Quigley Q22: Given the importance of community protection from wildfires, what percent of your budget and fuels reduction is focused in the areas immediately adjacent to communities?

Answer: The FY 2020 President's Budget proposes $450 million for Hazardous Fuels, which is 8.75 percent of the total discretionary budget and an increase of $15 million over the 2019 enacted level. With this funding, the agency aims to reduce hazardous fuels on 3.4 million acres in 2020, working with state partners to prioritize investments in places where the greatest wildfire risk exists and where fuels treatments have a high probability of reducing that risk. In 2018, the Forest Service completed fuels treatments on over 3.4 million acres, 2 million of which were in the wildland-urban interface to protect communities. This budget request continues the upward trajectory to increase treatments of fuels and protect communities.

Quigley Q23: Given the proposed simplification and bundling of budget line items in the Forest Service's budget, as well as the simplification of targets and performance measures, how will the USFS demonstrate continued commitment to other stakeholder/environmental values?

Answer: The integration of budget line items will allow for improved prioritization of activities at a landscape scale and streamlining of administrative costs. The proposed budget structure will also facilitate improved collaboration across program areas to focus on outcomes across all program areas at a landscape scale rather than simply the outputs of any one program. With reduced administrative costs, agency experts will be able to focus on land management priorities and accomplishing work for the broad range of stakeholders we support. The Forest Service intends to deliver on all existing performance expectations regardless of the agency's budget structure.

Quigley Q24: How will simplified performance measures proposed in the budget track (and demonstrate to Congress) the implementation of prescribed fire – a necessary final step for reducing fire risk? The forest service has indicated that of the 52 million "high priority" acres, 35 million are best treated by prescribed fire. Does your budget support a 2 to 1 ratio for prescribed fire as the treatment?

Answer: The Forest Service has not proposed simplified performance measures and will continue to use a suite of performance measures that align with major program activities (see page 145 in the Forest Service 2020 President's Budget). Prescribed fire is a crucial component

of hazardous fuels reduction and reducing the risk of fire. The 2020 President's Budget requests $450 million for hazardous fuels reduction, which will include prescribed fire where appropriate to achieve the desired fuel conditions to reduce risk.

The Forest Service tracks the implementation of prescribed fire within hazardous fuels work. In the majority of instances, prescribed fire is used to achieve the final desired condition. We are able to see the ratio of prescribed fire that contributes to measures that track the extent to which prescribed fire is being used to accomplish our goals. At present, prescribed fire typically accounts for roughly half of our hazardous fuels accomplishments on an annual basis. Fuels treatments are developed collaboratively with partners, and funds will be invested where the greatest risk from wildfire exists and where fuel treatments have a high probability of reducing that risk.

Quigley Q25: What portion of the USFS budget is associated with fire suppression?

Answer: The FY 2020 President's Budget requests $1.011 billion for Suppression Operations, about 20 percent of the total discretionary request. If spending requirements exceed that amount, the Budget also requests $1.95 billion in wildfire suppression cap adjustment funds.

Quigley Q26: How do simplified or "flagship" targets capture the commitment of the USFS to address climate change in a meaningful way?

Answer: Flagship targets capture the absolute amount of land management projects in terms of volume and acres treated for hazardous fuels. Many projects are informed and guided by R&D science-management partnerships including inventory and climate science. These partnerships ensure that forests are resilient to future climates and climate variability. Forest Inventory and Analysis (FIA) provides the basis for broad land-scape level planning and captures the national impact of forest land management on greenhouse gas mitigation. The Forest Service remains committed to addressing the impacts of a changing climate on the Nation's forests. Many of the Forest Service internal performance measures track progress towards improving forest condition, which in turn helps address the impacts of a changing climate.

Good Neighbor Authority

Quigley Q27: What is the plan for the USFS to track and report on the value of federal timber being used to support restoration projects?

Answer: The Forest Service tracks all timber sale volume and value sold through our Forest Products information systems. With this system we can track not only all timber sales, but projects carried out under the Collaborative Forest Landscape Restoration Program (CFLRP), Joint Chief's Projects, Stewardship projects, and Good Neighbor sales. Within the contracts we can analyze the various forest products sold along with the size of contract.

Quigley Q28: More specifically, given the change in the authority to allow states to manage program income, how does the USFS plan on demonstrating accountability to Congress and ensuring that program income is used for restoration as required in the statute?

Answer: We are developing policies to implement the new authorities under the 2018 Farm Bill. Part of the implementation guidelines will be the specific requirements to report the volume and value of all forest products sold through the Good Neighbor and Stewardship authorities. We are working closely with our Financial Policy staff to ensure we meet all requirements. We are committed to demonstrating accountability and complying with the intent of the statute.

Quigley Q29: It seems that GNA creates an incentive to use it in high-value forests, yet these are not the forests most in need of restoration. Do you expect that relatively low value, fire prone forests will contain sufficient timber value to complete restoration and can you support that with studies?

Answer: We have placed an emphasis on integrating low-value treatments with higher value timber sales to allow for more acres to be treated in each project. The Forest Service conducts not only a NEPA analysis on all projects, but also a financial analysis. Projects are selected to be either a Good Neighbor authority, Stewardship, or a traditional sale depending on the estimated costs and revenues identified in the appraisal process. Sales are directed to states or partners when the appraisal shows that it is more cost effective to have the state or partner do the project, or there are opportunities for them to financially contribute to the project to help offset the costs. When a project is better suited to integrate other federal funding sources to help support all of the restoration activities, then the project most likely will be implemented directly by the Forest Service.

Lawsuits

Quigley Q30: Given that the USFS budget justification indicated that the agency paid out for only two substantive lawsuits in 2018, and at only around $250k at that, how does this indicate that environmental litigation is slowing the process in any meaningful way? Even considering 11 lawsuits in FY18, how does this demonstrate that litigation is precluding active forest management?

Answer: Because lawsuits typically take multiple years to resolve, it is important to look at the trend in litigation and the multiplying effects of lawsuits filed over time. In the period between fiscal years 2009-2018, the Forest Service recorded 134 lawsuits filed against projects with a primary activity of vegetation management, including timber production and timber salvage treatments. In total, 46 of those lawsuits were filed between FYs 2015 and 2016. In addition to delays in project implementation due to litigation, there is considerable work associated with supporting the defense of those project decisions. This lawsuit-related work diverts Forest Service staff from their primary resource management responsibilities and delays work on current activities and planning for future projects.

In addition, it is important to note that litigation trends vary across the country. For example, in the Forest Service's Northern Region (Montana, Northern Idaho, North Dakota) 12 lawsuits were filed over project decisions with active forest management activities between fiscal years 2015 and 2018. In the same time period in the Rocky Mountain Region (Colorado, Wyoming, South Dakota, Nebraska, Kansas), 1 lawsuit was filed on an active forest management decision. Consequently, the effects of litigation on active forest management decisions are more concentrated and acutely felt on national forests in certain regions.

Shared Stewardship

Quigley Q31: How will the Forest Service ensure accountability- public, legal, and fiscal- with its Shared Stewardship Initiative, which the agency characterizes as "allowing the states to lead on federal forest management"?

Answer: The agency's characterization of "allowing the states to lead on federal forest management" is an acknowledgement that:

- National Forests and Grasslands exist within a state's boundary;
- the mission of the agency is "To sustain the health, diversity and productivity of the Nation's forests and grasslands to meet the needs of present and future generations";
- The issues we are facing span federal, tribal, state, private and other legal jurisdictions and are of interest to many stakeholders.

Our intent for Shared Stewardship is to expand our relationship and partnership with states, and others, to address improving forest conditions, and take advantage of opportunities such as: reducing risk of large wildland fires; reducing impact of insect and disease outbreaks; increasing resiliency; supporting economies and communities; and providing goods, services, values and resources to meet the needs of the American public.

Accountability is important to the Forest Service. We promote partnerships and engagement with a wide variety of entities, including states, tribes, counties, and communities in general. While the Forest Service has been out reaching to states to engage in Shared Stewardship, we will continue to be inclusive of other groups and responsive to the broader public's needs.

We use a wide array of agreement types to document our partnerships. Each type of agreement has an oversight process to insurance compliance with federal appropriations law, best accounting practices, and other legal requirements. Agreements for Shared Stewardship or other such titled documentation have been general commitments. Promoting Shared Stewardship does not change our requirements to comply with federal laws and policies. Rather, this strategy is a recognition that, to achieve landscapes that are healthy and resilient to fire and other disturbances, we must take a more integrated approach to prioritizing investments in order to realize these goals.

Accomplishments so far under Shared Stewardship include a USDA MOU with the Western Governors' Association and a Shared Stewardship Agreement with the State of Idaho to implement a shared vision for improving forest health conditions across Idaho. Others State

agreements are in development, but we do not have specific performance targets for Shared Stewardship.

Quigley Q32: According to the agency's Shared Stewardship report science-based tools will be used to identify the highest priority areas for restoration. Can you describe how these science-based prioritization processes are playing out in the states? How is the Forest Service ensuring consistency across states? How are stakeholders plugging into the process, including at the national scale? And how will the Forest Service evaluate the effectiveness of Shared Stewardship agreements, including for watershed restoration, recreation, and wildlife habitat outcomes?

Answer: We are using several tools and working with states to establish a science-based prioritization process and stakeholder engagement approach specific to each state's needs.

At the national level, we are developing a new scenario investment planning tool that builds upon the National Cohesive Strategy for Wildland Fire Management. Scenario investment planning allows the agency to assess forest health risks across broad landscapes and project outcomes and tradeoffs for various management actions. Working with tribes, states, and other partners, we can then jointly set priorities for investing in management activities at the appropriate scale and place.

At the state level, we will assess the additional strategies and tools tribes, states, and partners offer. In many cases we will build off State Forest Action Plans. We will work with tribes and states to convene additional stakeholders and develop evaluation criteria for our joint efforts. While the specifics will vary by location, in all cases our goal is work with our partners to establish joint priorities, work across boundaries, and conduct active management at the scale needed to achieve the desired outcomes.

Collaborative Forest Landscape Restoration Program

Quigley Q33: The President's budget zeros out the CFLRP program, alleging that other programs essentially do the same work and accomplish the same outcomes. What are those programs, and what are their track records of success?

Answer: While the Collaborative Forest Landscape Restoration Program taught us additional lessons about the benefits of working with collaborative groups, the Forest Service has a number of programs that encourage collaborative engagement with stakeholders and leverage partner dollars:

- The Joint Chiefs Landscape Restoration Program provides funding to accomplish shared restoration objectives across boundaries. In 2019, the Forest Service and the National Resources Conservation Service will invest $12 million in 13 projects.
- The Good Neighbor Authority allows the Forest Service to enter into agreements with tribes, states, and counties to work together to keep forests healthy and productive. Since Good Neighbor Authority was first authorized, the number of projects and participating

states has continued to grow. Nearly 200 Good Neighbor agreements in 37 states have been executed to perform a variety of restoration services.

- Stewardship contracting is another collaborative authority that we use. In FY 2018, 24% of the national total of timber sold was done under stewardship contracts. We are working with industry and communities to understand where and how we will most effectively use the new 20-year stewardship contracting authority that was granted in the FY 2018 Omnibus Appropriation.

Quigley Q34: What steps is the Forest Service taking to implement the extension of the CFLRP program authorized in the 2018 Farm Bill? Has the Forest Service stood up a federal advisory committee to approve new projects? What is the timing of the committee's first meeting? Has the Forest Service provided direction to existing CFLRP projects that want to apply for an extension of their projects about how to seek re-enrollment?

Answer: The Forest Service and the Secretary's office are working to establish Federal Advisory Committee Act (FACA) committee for Collaborative Forest Landscape Restoration Program (CFLRP). Once approved, the agency will publish a Federal Register Notice to solicit applications for review. An initial FACA committee meeting may occur in early 2020. The 13 CFLRP projects selected in 2012 have the Chief's approval to complete the last two years of their original 10-year proposal, depending on available resources. Proponents of the 10 CFLRP projects selected in 2010 have been notified that they must apply for extensions.

Streams and Fish Habitat: Fish Passage

Goal: Maintain or restore the natural range and frequency of aquatic habitat conditions on the Tongass National Forest to sustain the diversity and production of fish and other freshwater organisms.
Objectives: Use baseline fish habitat objectives, identified in the Forest Plan Standards and Guidelines, to evaluate the relative condition of riparian and aquatic habitat.

Background: Fish and aquatic resources on the Tongass National Forest provide major subsistence, commercial, and sport fisheries. Abundant rainfall and watersheds with high densities of streams provide a high quantity and diversity of freshwater fish habitats. The Tongass National Forest provides spawning and rearing habitat for the majority of fish produced in Southeast Alaska. Past riparian harvest altered aquatic habitat by reducing the supply of large wood available to streams. Maintenance of this habitat and associated waters is a focal point for the public, State and Federal agencies, and Native organizations.

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

Fish Passage at Road Crossings

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.

Designing the crossing structure to fit the stream is the key for attaining fish passage objectives and avoiding many unintended and undesirable impacts. Culverts that constrict the stream channel may cause excessive water velocity, excessive bedload deposition or rapid change in water surface profile at the inlet. Culverts installed at a gradient significantly different than the natural stream grade can induce stream head cutting upstream or excessive deposition of bedload at the culvert inlet. Culverts that do not retain adequately sized bedload may lead to excessive water velocities within the culvert. Culverts with excessive water velocities within them may release energy by eroding the outlet control, leaving the outlet perched.

Design techniques to provide fish passage across roads include:

Natural Stream Bottom Design: Maintaining the natural streambed using bridges and bottomless arch culverts;

Stream Simulation Design: Installing culverts that mimic and retain the natural stream characteristics of stream width, gradient, substrate and pool depth and spacing. Stream simulation assumes that if a culvert is installed in a manner that mimics that of the stream channel the ability for fish movement will be no less or greater at the road crossing than in the natural channel (Photo 1).

Simplified Stream Simulation (SSS) Design: An experimental, potentially cost effective method of installing culverts in a manner that over time are expected to provide conditions in the culvert that closely mimic and retain natural stream characteristics of stream width, gradient and substrate. This is achieved by sufficiently sizing and countersinking the culvert and then staging bedload material directly upstream. Overtime, as a result of high flows, the staged and native bedload material becomes deposited within the culvert and fish passage conditions are achieved.

No Slope Design: Installing culverts that are countersunk and at a flat gradient. This technique has limited application and is only effective where the natural stream grade is also flat and the water is pooled and backwatered, as is found in palustrine, estuarine and occasionally floodplain channels.

Hydraulic Design: Culverts designed to result in predetermined water velocities or depths at predetermined flows. This design often includes installing culverts equipped with a system of weirs or baffles. The complex hydraulics and poor bedload transport associated with baffled culverts require very careful design considerations if fish passage is to be retained over time. This hydraulic design technique must match estimated fish swimming performance to calculated hydraulic conditions at a range of flows.

Removal: Removing culverts and restoring the natural stream channel.

Photo 1. Time series of culvert replacement for fish passage remediation using a stream simulation design.

Evaluation Criteria

The Tongass National Forest has identified and surveyed 3,687 fish stream road crossings along approximately 5,000 miles of forest roads. Thirty-five percent of these are anadromous crossings, while the remaining 65 percent are resident fish streams. Approximately 54 percent of the crossings are culverts and 46 percent are bridges or removed structures. Approximately 91 percent of the crossings have had fish passage determinations completed and 33 percent of those have been determined not to meet State of Alaska fish passage standards. There is an average of 0.36 miles and a median of 0.19 miles of fish stream habitat length upstream of the anadromous crossings 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 2017, the Tongass has re-installed, retrofitted or removed approximately 604 crossings that were previously not meeting passage standards in fish streams and potentially impeding fish passage. This number includes 25 culverts on roads that were converted to Forest Highways which the State of Alaska now has jurisdiction over. Not included 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 forty-seven of the 604 were remediated by being removed and 357 of them were reinstallations (Figure 1). The estimated cost of this remediation is 18.4 million dollars, indexed to 2018 dollars. Approximately 80 percent of the reinstallations were replaced with culverts, 18 percent were replaced with bridges, and 2% were retrofits or maintenance occurred. The monitoring provided in this report excludes bridges, removed structures and bottomless culverts since they routinely do not impede fish passage. Only non-bottomless culvert installations were evaluated since they are more problematic for fish passage.

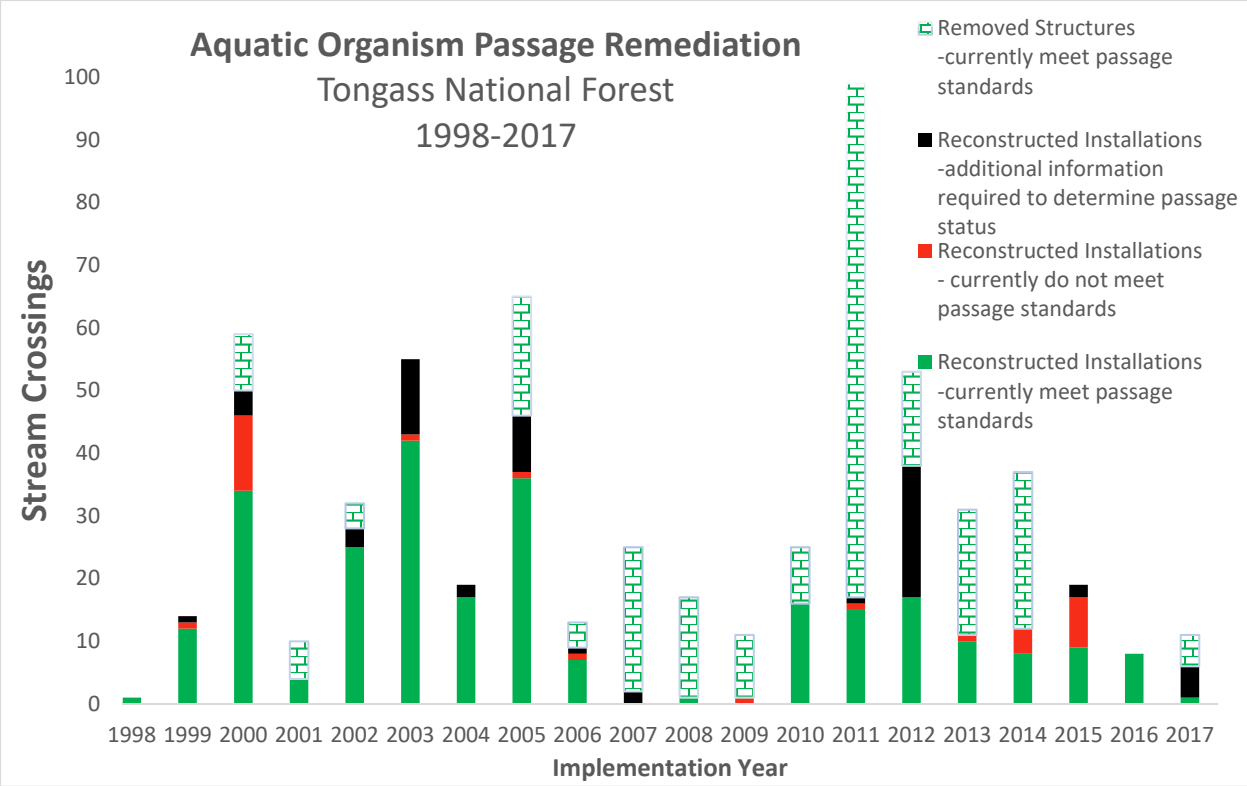

Figure 1. Aquatic organism passage remediation on the Tongass National Forest 1998 - 2017

The culverts were primarily assessed using criteria established in the USFS Alaska Region Juvenile Fish Passage Assessment Matrix (Table 1). 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.

- **GREEN category**: conditions are assumed to be adequate for fish passage and to meet State of Alaska juvenile fish passage flow standards.
- **RED category**: conditions are assumed not to be adequate for fish passage and not to meet State of Alaska juvenile fish passage flow standards.
- **GRAY category**: conditions are such that additional and more detailed analysis is required to determine their juvenile fish passage ability. This additional analysis includes use of the FishXing analytical software. Also includes all baffled pipes.
- **YELLOW category**: Conditions are assumed to be adequate for fish passage and to meet State of Alaska juvenile fish passage flow standards. However, the potentially insufficient depth of bedload material in the bottom of the culvert elevates concerns about the ability of the bedload to be retained. These culverts are on a more frequent inspection schedule to assure that bedload is retained
- **BLACK category**: The fish passage condition is unknown because critical survey measurements are not currently available.

Table 1. USFS Alaska Region juvenile salmonid fish passage assessment matrix

Structure Group #	Structure Group	Green Conditions assumed adequate to pass juvenile fish	Gray Conditions require additional analysis	Red Conditions assumed inadequate to pass juvenile fish
1	Bottomless pipe arch or embedded[1] pipe arch or embedded CMP[2].	Culvert span to bed width ratio >= 0.75 and no blockage or backwatered[3] and no blockage.	Culvert span to bed width ratio of 0.5 to 0.75 OR blockage >0 percent but <=10 percent.	Culvert span to bed width ratio <0.5 or blockage >10 percent
2	Non-embedded pipe arches and culvert span <= 144 inches or non-embedded CMP and culvert span > 48 inches and <=144 inches.	Culvert gradient <0.5 percent and no perch[4] and no blockage and culvert span to bed width ratio > 0.75 or backwatered and no blockage.	Culvert gradient between 0.5 percent - 2.0 percent or perch >0.0 feet but <=4 inches or blockage >0 percent but <=10 percent or culvert span to bed width ratio between 0.5 to 0.75.	Culvert gradient >2.0 percent or >4 inches perch or blockage >10 percent or culvert span to bed width ratio <0.5.
3	Non-embedded CMP and <= 48 inch span.	Culvert gradient <0.5 percent and no perch and no blockage and culvert span to bed width ratio > 0.75 or backwatered and no blockage	Culvert gradient between 0.5 percent - 1.0 percent or perch >0.0 feet but <=4 inches or blockage >0 percent but <=10 percent or culvert span to bed width ratio between 0.5 to 0.75.	Culvert gradient >1.0 percent or >4 inch perch or blockage >10 percent or culvert span to bed width ratio <0.5.
4	Non-embedded culvert and culvert span >144 inches	Culvert gradient <1.0 percent and no perch and no blockage and culvert span to bank full ratio > 0.75 or backwatered and no blockage.	Culvert gradient between 1.0 percent - 2.0 percent or perch >0.0 feet but <=4 inches or blockage >0 percent but <=10 percent or culvert span to bed width ratio between 0.5 to 0.75.	Culvert gradient >2.0 percent or >4 inch perch or blockage >10 percent or culvert span to bed width ratio <0.5.
5	Box culverts, tidally influenced culverts, culverts with non-standard configurations or materials or baffled culverts.	Fully backwatered	All	Perch >4 inches
6	Bridges or fords or removed structures	No road fill caused blockage	Not Applicable	Road fill causing blockage. Water piping through road fill
7	Multiple structure installations	Multiple structures are assessed as other similar structures with the exception that constriction is calculated by dividing the stream bedwidth by the sum of all the structure widths. The structure with the best passage performance is used to determine the passage capability of the entire array.		

Note: These criteria are not design criteria, but rather indicate whether the structure is likely to provide fish passage for juvenile salmonids at a particular point in time.

[1] Culverts are considered embedded if they have 100 percent bedload cover and average substrate depth >=20 percent of culvert rise. If culverts have 100 percent bedload cover and the average substrate depth is < 20 percent but > 5 percent of the culvert rise at both the inlet and outlet of the culvert and meet other criteria for a Green culvert than it will be identified as a Yellow crossing and requires more frequent re-inspections to assure bedload depth is retained.

[2] CMP – corrugated metal pipe

[3] The culvert is considered backwatered if the elevation of the top-of-water at the downstream control is greater than the elevation of the upstream invert of the culvert. Culvert gradient, constriction, and perch criteria are not considered in the assessment of fish passage in backwatered culvert.

[4] Perch is calculated as a flow dependent value. Perch is the defined as the difference in height between the downstream invert of the culvert (or top of bedload at downstream end of culvert if bedload is present) and top-of-water at the downstream control.

Sampling/Reporting Period

The sampling period is annual. A subsample of culverts installed from 1998 - 2017 in fish streams are monitored annually.

Monitoring Results

As part of a multi-year monitoring project, 42 culverts spanning fish streams were monitored in 2016 and 2017 to assess their ability to provide fish passage (Photo 2). These culverts were chosen from 269 culverts which have been installed, reinstalled or retrofitted in fish streams between 1998 and 2017. The culverts monitored in 2016 and 2017 are located on Chichagof, Wrangell, False, Kruzof, Mitkof, and Prince of Wales Islands. From 2000 through 2006 and 2009 through 2015 culverts were monitored on Kupreanof, Kuiu, Wrangell, Mitkof, Zarembo, Revillagigedo, Chichagof, False, and Prince of Wales Islands. Twenty-nine culverts that were installed between 2012 and 2015 using a simplified stream simulation (SSS) design were monitored annually between 2012 and 2015. In 2016, 13 of these were resurveyed and in 2017, 18 were resurveyed. The 251 unique stream crossings monitored to date as part of this assessment constitute approximately 91 percent of the culverts (excluding bottom-less culverts) recently installed, reinstalled or retrofitted in fish streams on the Tongass National Forest.

Eighty percent of the culverts monitored are green or yellow and have met the acceptable passage criteria established in the juvenile fish passage criteria matrix (Table 1). They 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 are Gray and 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 (67 percent) of the 252 stream crossings monitored were installed between 2000 and 2005 (Table 2).

Fifty-five percent of the monitored culverts used stream simulation designs, 12 percent were installed using a SSS design, 2 percent are hydraulic designed or baffled culverts, 19 percent utilized a no-slope design, 1% were retrofits, and 11 percent were incorrectly designed without adequate fish passage considerations. Two percent of the stream simulated designed culverts are red. Of the three red stream simulated designed culverts, two have had a segment of their length completely scoured free of bedload and one was blocked by woody debris. Twenty-one percent of the SSS designed culverts are red due to insufficient bedload accumulation within the culverts or constriction of the channel due to undersized culvert. None of the 47 installed no-slope designed culverts were red. All five of the hydraulic designed culverts require additional more comprehensive analysis to determine passage status. Twenty-eight culverts were installed without discernable fish passage design considerations and as a result 24 (86%) of them are red. Seven of those most likely were not identified as crossings requiring passage at time of installation and therefore were not designed appropriately (Figure 2). It is undetermined why the other seventeen culverts were installed without adequate design considerations.

Photo 2. Survey of culvert conditions

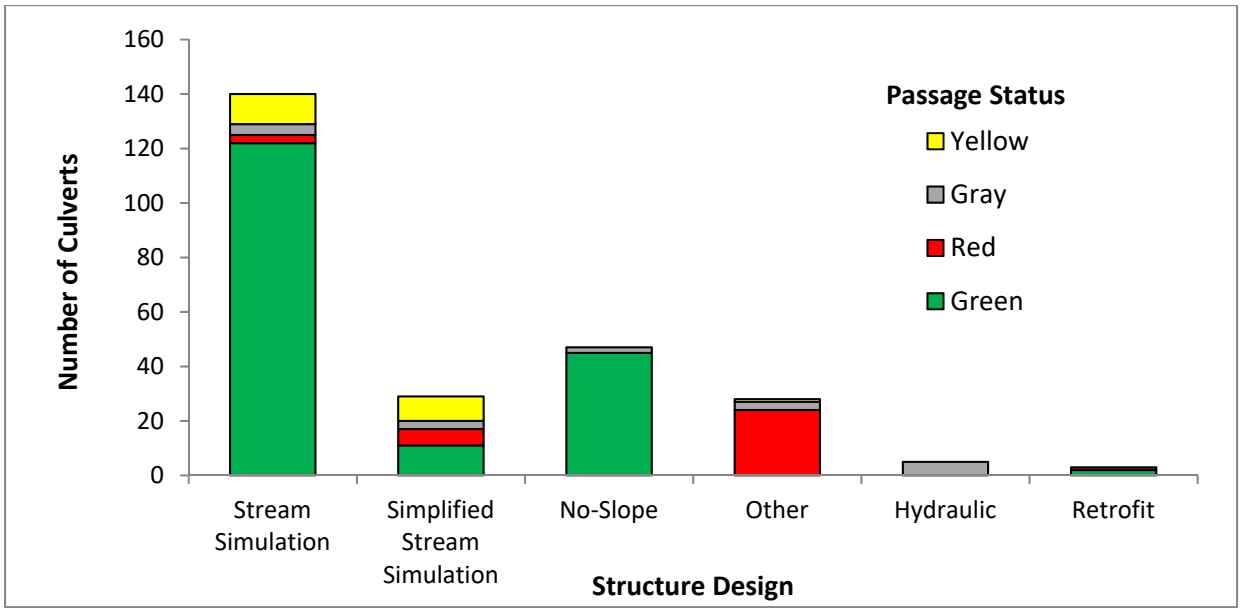

Figure 2. Design type and juvenile fish passage status of monitored culverts.

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.

However, some of the crossings determined to be consistent with passage standards had some issues associated with them that required or may require some action. Four of the culverts had woody debris blockages in them but were subsequently cleared. Several of the culverts which have bedload retaining weirs installed in them are not retaining bedload to the desirable amount. This causes slight vertical drops at the weirs and may provide a less than an ideal amount of channel roughness within the culvert. One culvert had a section of subsurface flow within the culvert which was most likely due to an insufficient amount of finer bedload material. However, this stream channel also had a section of naturally occurring interrupted flow directly downstream of the culvert.

Table 2. Monitored Culvert Measurements

District	Road	M.P.	Culvert Type	Design	Install Year	Monitor Year	Culvert Outlet Perch	Percent Culvert Bedload Cover	Ratio Bedload Depth to Culvert Rise	Ratio Stream Bedwidth to Culvert Width	Culvert Gradient to Channel Gradient	Percent Debris Blockage	Juvenile Passage Status
Petersburg	40000	2.492	round	simulation	2002	2009	No perch	100%	0.32	1.41	2.8% : 8%	0%	Green
Petersburg	40000	3.129	round	simulation	2002	2010	No perch	100%	0.4	1.00	4.6% : 7%	0%	Green
Petersburg	40000	3.194	arch	simulation	2002	2010	No perch	100%	0.23	1.31	6.3% : 7%	0%	Green
Petersburg	40000	3.292	round	simulation	2002	2009	No perch	100%	0.38	1.28	4.1% : 6%	0%	Green
Petersburg	40000	3.337	arch	simulation	2002	2009	No perch	100%	0.26	0.97	6.7% : 9%	0%	Green
Petersburg	40000	3.356	round	simulation	2002	2009	No perch	100%	0.37	0.93	5.2% : 7%	0%	Green
Petersburg	40000	3.552	arch	simulation	2002	2010	No perch	100%	0.23	1.62	7.1% : 8%	0%	Green
Petersburg	40000	3.739	round	simulation	2003	2011	No perch	100%	0.47	0.94	6.7% : 12%	0%	Green
Petersburg	40000	5.001	round	hydraulic	2002	2009	No perch	n/a	n/a	n/a[4]	6.9% : 0%	0%[1]	Gray
Petersburg	6235	12.361	round	simulation	2002	2009	No perch	100%	0.35	1.22	5.1% : 7%	0%	Green
Petersburg	6235	12.932	round	simulation	2002	2009	No perch	100%	0.41	1.5	4.7% : 5%	0%	Green
Petersburg	6235	15.45	round	simulation	2003	2009	No perch	100%	0.35	1.27	0.1% : 3%	0%	Green
Petersburg	6235	15.846	round	simulation	2002	2009	No perch	100%	0.42	1.01	1.0% : 2%	0%	Green
Petersburg	6235	17.071	round	simulation	2002	2009	No perch	100%	0.36	1.25	1.4% : 1%	0%	Green
Petersburg	6235	17.579	arch	simulation	2002	2009	No perch	100%	0.41	2.00	2.7% : 1%	0%	Green
Petersburg	6241	3.932	arch	simulation	2000	2005	No perch	100%	0.27	1.04	0.3% : 3%	0%	Green
Petersburg	6245	0.94	arch	simulation	1998	2009	No perch	100%	0.28	0.95	1.6% : 4%	0%	Green
Petersburg	6245	1.256	arch	simulation	2003	2009	No perch	100%	0.5	1.15	8.8% :16%	0%	Green
Petersburg	6245	1.503	round	simulation	2003	2009	No perch	100%	0.23	1.00	5.0% : 7%	0%	Green
						2012	No Perch	100%	0.14	1.00	5.1%: 7%	0%	Green
Petersburg	6245	4.69	round	simulation	2003	2009	No perch	100%	0.43	1.17	1.7% : 5%	0%	Green
Petersburg	6245	4.962	round	simulation	2003	2009	No perch	100%	0.51	1.21	4.8% : 8%	0%	Green
Petersburg	6245	8.562	round	simulation	2003	2009	No perch	100%	0.31	1.14	6.4% :7%	0%	Green
						2012	No Perch	100%	0.31	0.73	6.4% : 7%	0%	Green
Petersburg	40010	0.146	arch	simulation	2001	2009	No perch	100%	0.2	0.76	1.6% : 6%	0%	Green

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						2015	No Perch	100%	0.19	0.76	1.6% : 6%	0%	Yellow
Petersburg	6204	0.318	round	other [13]	2009	2009	No perch	38%	0.04	1.18	1.4% : 4%	0%	Green
						2010	No Perch	100%	0.03	1.33	1.3% : 2%	0%	Red
Petersburg	6204	1.997	round	simulation	2003	2009	No perch	100%	0.49	1.00	2.0% : 9%	0%	Green
Petersburg	6204	8.002	round	simulation	2003	2009	No perch	100%	0.34	1.33	2.0% :3%	0%[1]	Green
Petersburg	6350	4.612	round	no slope [2]	2002	2010	No perch	100%	0.04	1.45	-0.7% : 5%	0%	Green
Petersburg	6350	4.693	round	no slope [2]	2002	2010	No perch	0%	0	1.3	0% : 2%	0%	Green
Petersburg	6350	17.465	plastic	other[7]	2013	2014	0.7 feet	0%	0	0.69	1.1% : 3%	0%	Red
Petersburg	6402	6.387	plastic	other[13]	2015	2015	No perch	0%	0	0.45	1.2% : 3%	0%	Red
Petersburg	6402	6.443	plastic	other[13]	2015	2015	0.3 feet	0%	0	0.36	4.5% : 3%	0%	Red
Petersburg	6402	7.361	plastic	other[7]	2015	2015	1.1 feet	0%	0	n/a[4]	1.3% : 1%	0%	Red
Petersburg	6402	7.872	arch	simulation	2005	2010	No perch	100%	0.27	1.00	0.9% : 3%	0%	Green
Petersburg	6402	11.17	arch	simulation	2005	2010	No perch	100%	0.15	2.22	5.3% : 5%	0%	Yellow
Petersburg	6402	12.211	round	other[7]	2015	2015	0.6 feet	0%	0	0.5	5.5% : 4.5%	0%	Red
Petersburg	6407	1.743	round	simulation	2005	2010	No perch	100%	0.41	1.17	11.4% : 8%	0%	Green
Petersburg	6407	4.526	round	simulation	2005	2010	No perch	100%	0.38	1.28	5.4% : 7%	0%	Green
Petersburg	6407	4.558	arch	simulation	2005	2015	No perch	95%	0.02	0.64	2.6% : 5.5%	0%	Red
Petersburg	6407	6.208	round	simulation	2005	2010	No perch	100%	0.39	1.43	1.4% : 8%	0%	Green
Petersburg	6415	2.339	dual arch[3]	simulation	2000	2010	No perch	100%	0.15	1.00	3.5% : 4%	0%	Green
Petersburg	6415	2.341	dual arch[3]	simulation	2000	2010	No perch	100%	0.22	1.00	3.6% : 4%	0%[1]	Green
Petersburg	6415	2.836	arch	simulation	2000	2010	No perch	100%	0.21	0.78	3.1% : 4%	0%	Green
Petersburg	6415	3.366	arch	simulation	2000	2010	0.3 feet6	100%	0.14	1.14	1.1% : 4%	0%	Yellow
Petersburg	6415	4.223	arch	simulation	2000	2010	No perch	100%	0.43	1.19	4.6% : 3%	0%	Green
Petersburg	6415	7.198	arch	simulation	2000	2010	No perch	100%	0.17	0.9	4.8% : 9%	0%	Yellow
Petersburg	6415	8.772	arch	simulation	1998	2010	No perch	100%	0.12	0.95	0% : 3%	0%	Green
Petersburg	6415	12.729	arch	simulation	2005	2010	No perch	100%	0.26	1.95	4.9% : 6%	0%	Green

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Petersburg	6314S	8.739	round	other[7]	2002	2010	0.1 feet	0%	0	0.61	4.5% : 12%	0%	Red
Petersburg	6314S	8.817	round	no-slope	2002	2010	No perch	100%	0.1	1.09	0.0% : 1%	0%	Green
Petersburg	6314S	8.915	round	no slope [2]	2002	2010	No perch	0%	0	1.04	0.3% : 0%	0%	Green
Petersburg	6314S	8.959	round	no slope [2]	2002	2010	No perch	100%	0.29	0.98	0.3% : 1%	0%	Green
Petersburg	6314S	9.575	round	simulation	2002	2010	No perch	100%	0.2	2.06	5.3% : 10%	0%	Green
Petersburg	6314S	9.699	round	other[7]	2002	2010	0.3 feet	0%	0.01	1.05	3.8% : 8%	0%	Red
Petersburg	6314S	12.535	round	simulation	2002	2010	No perch	100%	0.27	0.96	2.1% : 12%	0%	Green
Petersburg	6314S	13.223	arch	simulation	2002	2010	No perch	100%	0.2	0.81	3.5% : 6%	0%	Green
Petersburg	6314S	13.284	round	other[7]	2002	2010	No perch	0%	0	1.00	2.9% : 4%	0%	Red
Petersburg	45001	0.185	round	simulation	2001	2010	No perch	100%	0.148	1.16	5.5% : 8%	0%	Green
Petersburg	45001	0.485	round	simulation	2001	2010	No perch	100%	0.14	1.52	1.9% : 6%	0%	Yellow
Petersburg	6030	0.512	round	simulation	2001	2010	No perch	100%	0.47	0.92	1.1% : 4%	0%	Green
Petersburg	6031	0.583	round	simulation	2003	2011	No perch	100%	0.22	1.56	0.5% : 2%	0%	Green
Petersburg	6031	0.597	round	simulation	2003	2011	No perch[9]	100%	0.13	1.04	2.6% : 6%	0%	Yellow
Petersburg	6031	3.161	arch	simulation	2003	2011	No perch	93%	0.141	1.02	5.1% : 5%	0%	Red
Petersburg	6031	3.833	round	simulation	2003	2011	No perch	100%	0.32	1.16	3.6% : 5%	0%	Green
Petersburg	6031	4.34	round	no slope[2]	2003	2011	No perch	100%	0.11	0.85	1.8% : 2%	0%	Green
Petersburg	6031	5.84	round	simulation	2003	2011	No perch	100%	0.39	1.43	1.5% : 3%	0%	Green
Petersburg	6031	6.166	round	simulation	2003	2011	No Perch	100%	0.32	1.00	0.9% : 3%	0%	Green
Petersburg	6317	0.043	round	simulation	2003	2004	No perch	100%	0.33	0.67	0.5% : 4%	0%	Green
Petersburg	6319	8.413	round	simulation	2003	2011	No perch	100%	0.4	0.96	4.2% : 4%	0%	Green
Petersburg	6319	10.975	round	simulation	2003	2011	No perch	100%	0.3	1.79	2.9% : 5%	0%	Green
Petersburg	6323	0.162	round	simulation	2003	2011	No perch	100%	0.27	2.17	4.2% : 2%	0%	Green
Petersburg	6256	3.146	arch	simulation	2006	2011	No perch	100%	0.3	n/a[4]	0.2% : 1%	0%	Green
Petersburg	6256	4.499	round	simulation	2006	2011	No perch	100%	0.38	n/a[4]	1.8% : 0%	0%	Green
Petersburg	6256	5.528	round	simulation	2006	2011	No perch	100%	0.42	n/a[4]	0% : 0.6%	20%[11]	Red

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Petersburg	Raven	Trail	round	hydraulic	2015	2016	No perch	100%	0.4	0.69	2.2%: 2%	0%	Gray
Wrangell	6259	2.334	arch	SSS	2014	2014	No perch	100%	0.18	1.21	3.6% : 4%	0%	Yellow
						2015	No perch	100%	0.2	1.21	3.5% : 4%	0%	Green
						2017	No perch	95%	0.16	1.14	2.5% : 4%	0%	Red
Wrangell	6259	2.782	arch	SSS	2014	2014	No perch	95%[12]	0.25	0.63	3.7% : 3%	0%	Green
						2015	No perch	66%[12]	0.22	0.63	3.5% : 3%	0%	Green
						2016	No perch	95%[12]	0.08	0.63	3.8% : 3%	0%	Gray
						2017	No perch	62%[12]	0.07	0.5	3.6% : 3%	0%	Red
Wrangell	6259	2.787	arch	SSS	2014	2014	No perch	70%	0.112	0.84	2.1 : 3%	0%	Green
						2015	No perch	100%	0.112	0.84	-5.8% : 4%	0%	Green
						2017	No perch	66%[12]	0.03	0.87	2.2% : 3%	0%	Yellow
Wrangell	6299	2.263	arch	simulation	2003	2010	No perch	100%	0.29	0.96	5.0% : 9%	0%	Green
Wrangell	6299	2.544	round	retrofit	2003	2010	No perch	70%	0.02	0.63	2.3% : 7%	0%	Red
Wrangell	6299	2.508	round	simulation	2003	2010	No perch	100%	0.33	1.11	3.3% : 5%	0%	Green
Wrangell	6299	2.577	round	simulation	2003	2010	No perch	100%	0.36	0.95	3.8% : 5%	0%	Green
Wrangell	6585	5.127	round	simulation	2005	2012	No perch	100%	0.28	1.14	10.4%:11%	0%	Green
Wrangell	6585	5.285	round	simulation	2005	2012	No perch	100%	0.42	1.04	0.8% : 6%	0%	Green
Wrangell	6585	5.597	round	simulation	2005	2012	No perch	100%	0.41	1.02	7.3% : 10%	0%	Green
Wrangell	6585	11.447	arch	simulation	2005	2012	No perch	100%	0.21	1.17	3.1% : 6%	0%	Green
Wrangell	6590	0.677	arch	no-slope[2]	2014	2014	No perch	100%	0.38	0.83	0.3% : 3%	0%	Green
						2015	No perch	100%	0.32	0.83	0.0% : 3%	0%	Green
Wrangell	6590	1.674	round	other[14]/[2]	2014	2014	No perch	50%	0.12	1.38	1.1% : 2%	0%	Red
						2015	No perch	90%	0.12	1.38	1.1% : 2%	0%	Yellow
Wrangell	6590	4.396	round	other[13]	2007	2014	1"	0%	0	1.2	1.7% : 5%	0%	Red
Wrangell	6590	6.433	arch	simulation	2005	2012	No perch	30%	0.002	0.56	1.8% : 6%	0%	Green
Wrangell	6590	11.197	round	simulation	2005	2012	No perch	100%	0.36	1.1	3.7% : 5%	0%	Green

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Wrangell	6590	11.597	dual arch[3]	simulation	2005	2012	No perch	100%	0.03	0.57	0.8% : 6%	0%	Gray
Wrangell	6590	14.046	round	no-slope	2014	2014	No perch	83%	0.06	1.11	-0.4 : 6%	0%	Green
						2015	No perch	90%	0.06	1.11	-0.3% : 6%	0%	Green
Wrangell	6590	18.55	round	simulation	2005	2012	No perch	100%	0.34	1.00	7.0% : 9%	0%	Green
Wrangell	6590	18.734	round-baffled	hydraulic	2005	2012	No perch	10%	0.12	1.03	10.4% : 9%	0%	Gray
Wrangell	6590	22.056	arch	no-slope	2014	2014	No perch	96%	0.11	0.88	0.2% : 5%	0%	Green
						2015	No perch	100%	0.1	0.88	0.1% :5%	0%	Green
Wrangell	6590	28.661	round	simulation	2005	2012	No perch	100%	0.35	1.17	11.5%:12%	0%	Green
Wrangell	6590	36.018	round	simulation	2005	2012	No perch	100%	0.34	0.98	8.5% : 11%	0%	Green
Wrangell	6590	36.079	round	simulation	2005	2012	No perch	100%	0.38	1.1	9.5% : 12%	0%	Green
Wrangell	50054	0.033	arch	SSS	2014	2014	No perch	0%	0	0.88	2.2% : 5%	0%	Red
						2015	No perch	0%	0	0.88	2.2% : 5%	0%	Red
						2016	No Perch	0%	0	0.88	2.3% : 5%	0%	Red
						2017	No perch	0%	0	0.66	2.2% : 5%	0%	Red
Wrangell	50054	0.063	round	SSS	2014	2014	No perch	100%	0.09	0.8	1.3% : 1%	0%	Yellow
						2015	No perch	100%	0.14	0.8	1.2% : 1%	0%	Yellow
						2016	No perch	80%[12]	0.13	0.8	1.3% : 1%	0%	Yellow
						2017	No perch	80%[12]	0.13	1.5	1.3% : 1%	0%	Yellow
Wrangell	50054	0.086	round	SSS	2014	2014	No perch	100%	0.14	0.95	1.5% : 3%	0%	Yellow
						2015	No perch	100%	0.13	0.95	1.6% : 3%	0%	Yellow
						2016	No perch	100%	0.14	0.95	1.4% : 3%	0%	Yellow
						2017	No perch	100%	0.16	1.11	1.4% : 3%	0%	Yellow
Wrangell	50055	0.031	arch	SSS	2014	2014	No perch	100%	0.07	1.69	2.5% : 2%	0%	Yellow
						2015	No perch	100%	0.07	1.69	2.5% : 2%	0%	Yellow
						2016	No perch	100%	0.06	1.69	2.4% : 2%	0%	Yellow
						2017	No perch	100%	0.08	1.48	2.4% : 2%	0%	Yellow

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Craig	2024200	0.81	round	simulation	1999	2010	No perch	100%	0.182	0.84	1.4%: 4%	0%	Green
Craig	2024300	0.236	round	simulation	1999	2011	No perch	100%	0.23	0.82	3.1% : 4%	0%	Green
Craig	2024300	0.26	round	simulation	1999	2011	No perch	100%	0.5	0.88	0.4% : 4%	0%	Green
Craig	2100000	0.23	round	simulation	2005	2010	No perch	100%	0.42	1.36	3.3% : 4%	0%	Green
Craig	2100000	2.07	round	simulation	2000	2010	No perch	100%	0.18	1.11	0.4% : 7%	0%	Green
Craig	2100000	5.19	arch	simulation	2005	2010	No perch	100%	0.26	1.51	6.0% : 8%	0%	Green
Craig	2100000	5.71	round	no-slope	2004	2013	No perch	5%	0.04	NA	0.4% : 0%	0%	Green
Craig	2120000	0.83	arch	simulation	2005	2010	No perch	100%	0.22	1.15	6.1% : 10%	0%	Green
Craig	2150000	8.87	round	simulation	2005	2010	No perch	100%	0.42	1.29	2.2% : 4%	0%	Green
Craig	2150000	8.92	round	simulation	2005	2010	No perch	100%	0.23	1.58	1.7% : 4%	0%	Green
Thorne Bay	1520000	1.819	round	simulation	2007	2014	No perch	2%	0.07	1.08	0.6% : 2.5%	0%	Gray
Thorne Bay	2000000	102.91	arch	SSS	2012	2012	No perch	100%	0.15	0.94	0.9% : 2%	0%	Red
						2013	No perch	100%	0.21	0.94	0.9% : 2%	0%	Green
						2014	No perch	100%	0.21	0.94	0.9% : 2%	0%	Green
						2015	No perch	100%	0.27	0.94	1.0% : 2%	0%	Green
Thorne Bay	2000000	122.68	arch	SSS	2013	2013	No perch	38%[12]	0.3	1.39	1.7% : 2%	0%	Green
						2014	No perch	40%[12]	0.32	1.39	1.7% : 2%	0%	Green
						2015	No perch	100%	0.17	1.39	1.8% : 2%	0%	Green
Thorne Bay	2000000	125.24	arch	SSS	2013	2013	No perch	86%[12]	0.2	1.09	1.8% : 3%	0%	Green
						2014	No perch	100%	0.18	1.09	1.8% : 3%	0%	Yellow
						2015	No perch	100%	0.17	1.09	3.3% : 3%	0%	Yellow
Thorne Bay	2000000	125.41	arch	no-slope[2]	2012	2014	No perch	0%	0	2.05	-0.3% : 5%	0%	Green
Thorne Bay	2000000	125.43	arch	no-slope[2]	2012	2014	No perch	0%	0	1.38	0.0% : 4%	0%	Green
Thorne Bay	2000440	0.72	round	other[13]	2003	2010	0.4 feet	0%	0	0.93	2.9% : 5%	0%	Red
	2000860	0.659	arch	SSS	2013	2013	No perch	54%[12]	0.27	1.01	2.7% : 4%	0%	Green

District	Road	M.P.	Culvert Type	Design	Install Year	Monitor Year	Culvert Outlet Perch	Percent Culvert Bedload Cover	Ratio Bedload Depth to Culvert Rise	Ratio Stream Bedwidth to Culvert Width	Culvert Gradient to Channel Gradient	Percent Debris Blockage	Juvenile Passage Status
Thorne Bay						2014	No perch	100%	0.3	1.01	2.7% : 4%	0%	Green
						2015	No perch	100%	0.35	1.01	2.8% : 4%	0%	Green
Thorne Bay	2085000	0.944	arch	SSS	2013	2013	No perch	100%	0.28	1.16	3.8% : 5%	0%	Green
						2014	No perch	100%	0.29	1.16	3.7% : 5%	0%	Green
						2015	No perch	100%	0.32	1.16	3.8% : 5%	0%	Green
Thorne Bay	2050000	5.78	arch	SSS	2015	2015	No perch	100%	0.1	0.97	4.7% : 4%	0%	Yellow
						2016	No perch	75%[12]	0.13	1.14	4.2% : 4%	0%	Yellow
						2017	No perch	75%[12]	0.14	1.47	4.4% : 5%	0%	Yellow
Thorne Bay	2050000	6.62	arch	SSS	2015	2015	No perch	100%	0.15	0.81	15.4% : 4%	0%	Yellow
						2016	No perch	100%	0.18	0.82	3.1% : 4%	0%	Yellow
						2017	No perch	100%	0.14	1.43	3.3% : 6%	0%	Yellow
Thorne Bay	2050000	7.76	round	no-slope	2016	2017	No perch	0%	0	n/a[4]	0.7% : 1%	0%	Green
Thorne Bay	2050200	0.22	arch-baffled	SSS	2015	2015	No perch	100%	0.11	0.88	4.8% : 5%	0%	Gray
						2016	No perch	100%	0.09	0.85	4.6% : 5%	0%	Gray
						2017	No perch	100%	0.16	1.19	4.6% : 6%	0%	Gray
Thorne Bay	2054000	2.22	round	simulation	2002	2010	No perch	100%	0.42	1.56	2.8% : 6%	0%	Green
Thorne Bay	2054000	3.56	round	simulation	2002	2010	No perch	100%	0.39	0.71	2.3% : 4%	0%	Green
Thorne Bay	2054000	3.78	round	simulation	2002	2010	No perch	100%	0.34	0.11	2.4% : 4%	0%	Green
Thorne Bay	2054300	0.46	round	simulation	2002	2011	No perch	100%	0.48	n/a[4]	1.0% : 0%	0%	Green
Thorne Bay	2700000	0.71	arch	SSS	2012	2012	No perch	45%[12]	0.15	1.36	3.0% : 2.0%	0%	Green
						2013	No perch	45%[12]	0.15	1.36	3.0% : 2.0%	0%	Green
						2014	No perch	100%	0.26	1.36	2.9% : 2.0%	0%	Green
						2015	No perch	100%	0.33	1.36	3.0 : 2.0%	0%	Green
Thorne Bay	2700000	5.623	round	simulation	2011	2013	No perch	100%	0.34	1.39	0% : 5%	0%	Green

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Thorne Bay	2700000	5.673	round	other	2004	2013	No perch	100%	0	1.2	1.0% : 4%	0%	Gray
						2017	No perch	100%	0.1	0.56	0.9% : 6%	0%	Gray
Thorne Bay	3000000	23.49	arch-baffled	SSS	2015	2015	No perch	100%	0.16	1.06	9.6% : 10%	0%	Red
						2016	No perch	96%	0.16	1.06	9.5% : 10%	0%	Gray
Thorne Bay	3000000	52.24	round	simulation	2003	2010	No perch	100%	0.36	1.16	3.3% : 13%	0%	Green
Thorne Bay	3000000	60.67	round	simulation	2003	2010	No perch	100%	0.33	1.3	9.7% : 15%	0%	Green
Thorne Bay	3000000	62.43	round	simulation	2003	2010	No perch	100%	0.37	0.9	4.8% : 9%	0%	Green
Thorne Bay	3000000	62.52	arch	simulation	2003	2016	0.1 feet	100%	0.2	0.81	6% : 6%	0%	Yellow
Thorne Bay	3000000	64.88	arch	simulation	2003	2010	No perch	100%	0.24	1.05	2.5% : 3%	0%	Green
Thorne Bay	3000000	79.94	round	no-slope	2012	2014	No perch	50%	0	1.14	0.3% : 4%	0%	Green
Thorne Bay	3000000	85.462	round	other[13]	2011	2014	1.1’	0%	0	n/a[4]	2.2% : 2%	0%	Red
Thorne Bay	3000000	89.221	arch	SSS	2013	2013	No perch	54%[12]	0.18	1.19	3.8% : 6.5%	0%	Yellow
						2014	No perch	100%	0.2	1.19	3.8% : 6.5%	0%	Green
						2015	No perch	100%	0.19	1.19	3.7% : 6.5%	0%	Yellow
						2016	No perch	100%	0.2	1.09	3.6% : 6.5%	0%	Green
Thorne Bay	3000000	93.211	round	no-slope	2012	2017	No perch	10%	0	n/a[4]	0.1% : 1%	0%	Green
Thorne Bay	3000330	1.14	round	no-slope	2003	2012	No perch	5%	0.03	n/a[4]	2.7% : 2%	0%	Green
Thorne Bay	3015000	1.773	arch	SSS	2012	2012	No perch	100%	0.11	0.76	3.4% : 10%	0%	Red
						2013	No perch	100%	0.15	0.76	3.4% : 10%	0%	Red
						2014	No perch	98%	0.11	0.76	3.5% : 10%	0%	Red
						2015	No perch	90%	0.06	0.76	3.5% : 10%	0%	Red
						2016	No perch	90%	0.06	0.73	3.5% : 10%	0%	Red
						2017	No perch	90%[12]	0.1	1.04	3.5% : 8%	0%	Yellow

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Thorne Bay	3015000	2.641	arch	simulation	2010	2011	No perch	100%	0.21	0.98	6.6% : 6%	0%	Green
Thorne Bay	3015000	0.344	round	simulation	2010	2011	No perch	100%	0.25	1.67	5.5% : 2%	0%	Green
Thorne Bay	3015000	8.743	arch	SSS	2012	2012	No perch	50%[12]	0.15	1.34	4.2% : 7%	0%	Green
						2013	No perch	58%[12]	0.15	1.34	4.2% : 7%	0%	Green
						2014	No perch	100%	0.41	1.34	4.2% : 7%	0%	Green
						2015	No perch	100%	0.36	1.34	4.1% : 7%	0%	Green
Thorne Bay	3015000	6.83	round	simulation	2010	2011	No perch	100%	0.29	1.22	5.5% : 4%	0%	Green
Thorne Bay	3015250	0.03	round	simulation	2010	2011	No perch	100%	0.39	1.25	4.6% : 5%	0%	Green
Thorne Bay	3030100	0.25	round	SSS	2015	2015	No perch	100%	0.29	0.97	4% : 8%	0%	Green
						2016	No perch	100%	0.23	0.97	3.9% : 8%	0%	Green
Thorne Bay	3030100	0.28	round	SSS	2015	2015	No perch	100%	0.22	0.92	2.9% : 5%	0%	Green
						2016	No perch	95%	0.18	0.92	2.8% : 5%	0%	Yellow
						2017	Np perch	100%	0.25	0.7	3.0% : 7%	0%	Gray
Thorne Bay	3030100	0.38	arch	SSS	2015	2015	No perch	20%	0.13	1.11	1.5% : 10%	0%	Gray
						2017	No perch	50%	0.12	1.08	1.6% : 15%	0%	Yellow
Thorne Bay	3030100	0.75	arch	SSS	2015	2015	No perch	100%	0.1	1.22	1.0% : 1%	0%	Green
						2016	No perch	100%	0.12	0.87[4]	1.0% : 1%	0%	Green
Thorne Bay	3030850	0.27	concrete box	hydraulic	2002	2010	No perch	100%	n/a	n/a[4]	5.0% : 4%	0%[1]	Gray
Thorne Bay	3030850	0.3	round	simulation	2002	2010	No perch	100%	0.34	1.72	6.0% : 7%	0%	Green
Thorne Bay	3030850	0.48	concrete box	hydraulic	2002	2010	No perch	100%	n/a	n/a[4]	0.7% : 3%	0%	Gray
Thorne Bay	3000330	1.14	round	No-slope	2003	2012	No perch	5%	0.03	n/a[4]	0.4% : 0%	0%	Green
Sitka	7520	0.793	arch	retrofit	2000	2000	No perch	100%	0.25	0.94	11% : 0.6%	0%	Green
Sitka	7520	1.143	arch	retrofit	2000	2001	No perch	0%	0.08	0.55	2.3% : 7%	0%	Red
Sitka	7540CB	6.827	arch	simulation	2000	2013	No perch	100%	0.25	1.02	6.1% : 5%	0%	Green

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Sitka	7540CB	6.845	round	simulation	2000	2013	No perch	100%	0.182	0.652	0.3% : 5%	0%	Green
Sitka	7540CB	7.267	round	simulation	2004	2013	No perch	100%	0.41	1.61	Unk : 1%	0%	Green
Sitka	7540CB	7.755	round	simulation	2004	2013	No perch	100%	0.32	1.14	4.1 : 4%	0%	Green
Sitka	7540CB	8.143	round	simulation	2004	2013	No perch	100%	0.39	1.56	4.6% : 3%	0%	Green
Sitka	7540CB	8.184	round	simulation	2004	2013	No perch	100%	0.38	1.72	4.3% : 3%	0%	Green
Sitka	7540CB	8.98	round	simulation	2004	2013	No perch	100%	0.31	0.81	6.1% : 7%	0%	Green
Sitka	7540CB	14.008	round	simulation	2004	2013	No perch	100%	0.37	1.00	5.7% : 6%	0%	Green
Sitka	7541	0.594	round	simulation	2000	2000	No perch	40%	0.08	0.88	0.4% : 9%	0%	Green
Sitka	7542	0.027	arch	simulation	2005	2013	No perch	100%	0.22	0.78	4.5% : 3%	0%	Green
Sitka	7542	0.109	round	simulation	2004	2013	No perch	100%	0.37	1.35	1.7% : 1%	0%	Green
Sitka	7542	0.314	round	simulation	2004	2013	No perch	100%	0.4	0.59	2.3% : 2%	0%	Gray
Sitka	7544	1.03	round	SSS	2015	2015	No perch	15%12	0.39	1.05	1.2% : 4%	0%	Green
						2017	No Perch	20%12	0.52	1.79	1.0% : 4%	0%	Green
Sitka	7544	1.376	round	simulation	2010	2017	No perch	100%	0.46	1.19	0.9% : 2%	0%	Green
Sitka	7544	2.198	round	no-slope	2000	2002	No perch	100%	0.02	n/a[4]	0.5% : 0%	0%	Green
Sitka	7544	2.394	round	no-slope	2000	2002	No perch	0%	0	n/a[4]	-0.3% : 0%	0%	Green
Sitka	7540FI	2.45	round	no-slope	2017	2017	No perch	0%	0	n/a[4]	0.4% : 0%	0%	Green
Sitka	7540FI	2.478	round	no-slope	2017	2017	No perch	0%	0	n/a[4]	-0.2% : 0%	0%	Green
Sitka	7540FI	2.5	round	no-slope	2017	2017	No perch	0%	0	n/a[4]	2.0% : 0%	0%	Green
Sitka	7540FI	4.428	round	SSS	2015	2015	No perch	20%[12]	0.31	1.00	0.7% : 4%	0%	Yellow
						2017	No perch	30%[12]	0.29	1.21	0.6% : 5%	0%	Yellow
Sitka	7540FI	4.48	round	SSS	2015	2015	0.8 feet	40%	0.19	0.73	2.1% : 4%	0%	Red
						2017	No perch	99%	0.09	1.21	2.0% : 5%	0%	Red
Sitka	7540FI	4.554	round	SSS	2015	2015	No perch	15%[12]	0.36	0.73	1.4% : 2%	0%	Green
						2017	No perch	20%[12]	0.37	0.73	1.3% : 3%	0%	Gray

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Sitka	7540FI	6.787	round	SSS	2015	2015	No perch	20%	0.35	1.11	4.8% : 7%	0%	Red
						2017	No perch	20%	0.35	1.11	5.2% : 6%	0%	Red
Sitka	7540FI	11.687	round	other	2000	2002	No perch	50%	0.05	0.54	2.7% : 8%	0%	Red
						2017	No perch	10%	0.05	0.54	3.0% : 6%	0%	Red
Sitka	7551	0.168	round	simulation	2004	2013	No perch	100%	0.36	1.52	1.9% : 2%	0%	Green
Sitka	7590	2.956	arch	simulation	2016	2017	No perch	100%	0.24	1.21	3.2% :	0%	Green
Sitka	7590	3.316	arch	simulation	2016	2017	No perch	100%	0.21	1.33	2.8% : 4%	0%	Green
Ketchikan	8000000	22.413	round	simulation	2010	2013	No perch	100%	0.27	1.13	5.8% : 8%	0%	Green
Ketchikan	8000000	22.493	round	simulation	2010	2013	No perch	100%	0.24	1.08	3.3% : 12%	0%	Green
Ketchikan	8000025	0.22	round	simulation	2000	2015	No perch	100%	0.56	0.78	0.0% : 3.5%	0%	Green
Ketchikan	8040000	1.771	arch	simulation	2010	2013	No perch	100%	0.29	0.91	4.7% : 9%	0%	Green
Ketchikan	8040000	4.187	round	simulation	2010	2013	No perch	100%	0.26	1.32	3.2% : 5%	0%	Green
Ketchikan	8040000	5.134	arch	simulation	2010	2013	No perch	100%	0.25	0.96	4.3% : 5%	0%	Green
Hoonah	8502	0.996	round	no-slope	1998	2004	No perch	100%	0.08	0.75	1.4% : 2%	0%	Green
Hoonah	8504	0.089	round	no-slope	1999	2014	No perch	100%	0.26	0.83	0.5%: 5%	0%	Green
Hoonah	8504	1.169	round	no-slope	1999	2014	No perch	100%	0.21	0.88	-0.3% : 4%	0%	Green
Hoonah	8504	1.181	round	no-slope	1999	2014	No perch	100%	0.13	0.88	0.5% : 4%	0%	Green
Hoonah	8508	11.353	round	no-slope	2000	2006	No perch	100%	0.33	0.91	0.3% : 2%	0%	Green
Hoonah	8508	11.539	round	no-slope	2000	2006	No Perch	100%	0.23	1.04	0.2% : 2%	0%	Green
Hoonah	8508	11.954	round	no-slope	2000	2006	No perch	100%	0.14	0.75	-0.1% : 3%	0%	Green
Hoonah	8508	12.193	round	no-slope	2000	2006	No perch	100%	0.35	1.02	-0.1% : 2%	0%	Green
Hoonah	8508	12.584	round	no-slope	2000	2006	No perch	100%	0.46	1.5	0.1% : 6%	0%	Green
Hoonah	8508	12.754	round	no-slope	2000	2006	No perch	100%	0.57	1.5	-0.8% : 7%	0%	Green
Hoonah	8508	13.547	round	no-slope	2000	2006	No perch	100%	0.53	1.33	-0.2% : 5%	0%	Green
Hoonah	8508	14.016	round	other[14]	2000	2006	No perch	100%	0.07	1.00	2.2% : 4%	0%	Red
Hoonah	8513	0.273	round	other[4]	1999	2014	No perch	15%	0	1.36	7% : 21%	0%	Red

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Hoonah	8513	0.795	round	simulation	2000	2014	No perch	100%	0.34	0.81	0.1% : 10%	0%	Green
Hoonah	8513	0.954	round	no-slope	2000	2014	No perch	100%	0.14	0.84	-0.1% : 14%	0%	Green
Hoonah	8513	1.463	round	no-slope	2000	2014	No perch	100%	0.27	0.92	-0.1% : 9%	0%	Green
Hoonah	8513	1.922	round	other	2000	2014	No perch	100%	0.08	0.61	0.8% : 2%	0%	Yellow
Hoonah	8530	3.09	round	simulation	2005	2015	No perch	100%	0.41	1.04	3.4% : 4%	0%	Green
Hoonah	8530	3.077	round	simulation	2005	2014	No perch	100%	0.35	0.63	1.8% : 2%	0%	Green
Hoonah	8530	4.13	round	simulation	2005	2014	No perch	100%	0.36	1.33	6.4% : 5%	0%	Green
Hoonah	8530	10.912	round	no-slope	2000	2014	No perch	100%	0.48	0.77	-0.1% : 2%	0%	Green
Hoonah	8530	13.092	round	no-slope	2000	2006	No perch	100%	0.49	1.5	0.1% : 7%	0%	Green
Hoonah	8530	13.886	round	other	1999	2014	No perch	100%	0.1	1.4	1.8% : 4%	0%	Yellow
Hoonah	8534	0.397	arch	simulation	2005	2014	No perch	100%	0.2	1.05	4.4% : 6%	0%	Green
Hoonah	8534	1.973	round	no-slope	2000	2006	No perch	100%	0.37	1.2	0.4% : 11%	0%	Green
Hoonah	8534	1.445	round	simulation	2005	2014	No perch	100%	0.36	0.98	7.1% : 9%	0%	Green
Hoonah	8534	1.554	round	other[14]	2000	2014	No perch	100%	0.04	0.78	2.9% : 10%	0%	Red
Hoonah	8534	1.895	round	no-slope	2000	2014	No perch	100%	0.25	0.64	-0.8% : 7%	0%	Gray
Hoonah	8534	3.051	round	simulation	2000	2005	No perch	95%	0.07	0.94	0.7% : 10%	0%	Gray
Hoonah	8576	1.222	arch	simulation	2004	2004	No perch	100%	0.29	1.24	2% : 3%	0%	Green
Hoonah	8576	5.096	round	no-slope	2000	2006	No perch	100%	0.31	1.05	-0.5% : 5%	0%	Green
Hoonah	8578	0.111	round	simulation	2003	2016	No perch	100%	0.38	2.22	6.1% : 14.5%	0%	Green
Hoonah	8578	0.219	round	simulation	2003	2016	No perch	100%	0.38	1.43	5.5% : 5.5%	0%	Green
Hoonah	8578	0.608	round	simulation	2003	2016	No perch	100%	0.44	1.09	10.4% : 13%	0%	Green
Hoonah	8578	3.342	round	simulation	2003	2016	No perch	100%	0.46	1.48	3.9% : 8%	0%	Green
Hoonah	8578	3.386	round	simulation	2003	2016	No perch	100%	0.44	2	8.2% : 11%	0%	Green
Hoonah	8578	3.511	round	simulation	2003	2016	No perch	100%	0.37	1.36	6.6% : 8%	0%	Green
Hoonah	8578	3.532	round	simulation	2003	2016	No perch	100%	0.54	1.15	6.7% : 9%	0%	Green
Hoonah	8578	3.764	round	simulation	2003	2016	No perch	100%	0.38	1.5	3.7% : 5.5%	0%	Green

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Hoonah	8580	0.722	round	no-slope	2000	2015	No perch	100%	0.26	0.95	0.2% : 1.5%	0%	Green
Hoonah	8580	2.035	round	simulation	2000	2015	No perch	100%	0.26	0.85	1.4% : 6%	0%	Green
Hoonah	8580	2.657	round	other[14]	2000	2015	3.6 feet	0%	0	1.11	11% : 4.5%	0%	Red
Hoonah	8580	2.756	round	simulation	2000	2003	No perch	100%	0.11	1.67	4.3% : 18%	0%	Yellow
Hoonah	8580	3.195	round	other[14]	2000	2015	0.7 feet	0%	0.02	0.89	5.5% : 6.5%	0%	Red
Hoonah	8580	3.287	round	other[14]	2000	2015	0.3 feet	0%	0	0.85	5.7% : 3%	0%	Red
Hoonah	8580	3.375	round	other[14]	2000	2015	No perch	0%	0	0.36	3.4% : 3%	0%	Red
Hoonah	8580	4.109	round	simulation	2000	2015	No Perch	100%	0.07	0.83	1.5% : 1.5%	0%	Yellow
Hoonah	8580	4.339	round	no-slope	2000	2015	No perch	100%	0.14	n/a[4]	0.1% : 0%	0%	Green
Hoonah	8580	9.058	round	no-slope	1998	2015	No perch	100%	0.21	n/a[4]	-1.7% : 0%	0%	Green
Hoonah	8580	9.228	round	other[14]	2000	2015	0.5 feet	0%	0.01	0.4	4.6% : 5%	0%	Red
Hoonah	8580	9.492	round	other[14]	2000	2015	1.2 feet	0%	0	0.57	3.7% : 10%	10%	Red
Hoonah	8580	9.838	arch	no-slope	2000	2015	0.2 feet	15%	0.01	0.58	0.5% : 4%	0%	Gray
Hoonah	8580	12.521	round	other[14]	2000	2015	No perch	0%	0	n/a[4]	2.3% : 1%	0%	Red
Hoonah	8582	0.181	round	no-slope	2000	2015	No perch	30%	0	0.33	-0.3% : 1%	0%	Green
Hoonah	8582	1.238	round	no-slope	2000	2001	No perch	100%	0.16	1.25	-.09% : 3%	0%	Green

[1] Culvert was partially blocked by woody debris at initial site visit but was subsequently cleared and fish passage was restored.

[2] Flow is backwatered in the culvert.

[3] There are two culverts installed at this crossing. One is occasionally dewatered at lower flows and acts as an overflow culvert.

[4] Channel is palustrine therefore comparing channel width to culvert width is not as relevant.

[5] At base flows, stream flow through the culvert is subsurface for approximately 60 percent of its length and is most likely due to lack of finer bedload material. Stream flow 50 feet downstream of the culvert has interrupted flow for 5 feet which may naturally also impede fish passage at some flows.

[6] The bedload retaining weirs placed in this culvert have not adequately retained bedload and the retaining weir at the culvert outlet has a 3 inch perch due to an inadequate downstream control. Fifteen feet upstream of the culvert is a 2.7 foot vertical natural fish barrier with a 5 inch jump pool.

[7] Stream crossing structure was not designed to provide fish passage due to it not being identified as a fish stream in the Tongass AOP database prior to installation.

[8] The installed bedload retaining weirs have not retained bedload to the desirable depths and small 0.2 foot vertical drops are present at most weirs.

[9] Furthest downstream rock band in culvert has scoured bedload downstream of it leaving a 0.8 foot drop. Need to potentially raise downstream control and reinsert rock in last several feet of culvert.

[10] No bedload present in upstream 4 feet of culvert however approximately 29 percent bedload depth in remaining section of culvert

[11] Culvert is partially blocked by woody debris and as of report date has not been cleared.

[12] This simplified stream simulation culvert does not have 100 percent bedload cover or does not meet the minimum threshold of 20 percent of bedload depth to culvert rise criteria, however the section without bedload or insufficient bedload depth is backwatered and effective passage is achieved. Bedload material is expected to continue to accumulate in the culvert.

[13] Stream crossing structure was not designed to provide fish passage due to project personnel apparently not aware of fish stream status reported in Tongass AOP database.

[14] Inadequate or unknown fish passage design consideration

Simplified Stream Simulation (SSS) Designed Culverts

In an effort to reduce the significant costs associated with the survey, design and installation of culverts intended to provide fish passage, the Tongass National Forest installed four culverts in 2012, five in 2013, seven in 2014, and thirteen in 2015 using a design coined simplified stream simulation (SSS) previously known as minimally engineered aquatic organism passage (MEAOP).

Photo 3. SSS designed culvert with surcharge material upstream of culvert

This approach strives to produce stream conditions, overtime, in the culvert that are reasonably similar to that found in the natural stream. Similar to stream simulated designed culverts, the goal is to create fish passage conditions in the culvert which reasonably mirror that of the natural channel by attempting to match stream gradient, width and bedload roughness. The general process involves embedding a properly sized culvert and depositing (surcharging) bedload material, sized to be capable of mobilizing at high flows, in the channel immediately upstream of the culvert (Photo 3). The expectation was that the material will mobilize, be deposited and retained in the embedded culvert. Subsequent monitoring found that this technique did not work in all cases. Problems arose when surcharged material wasn't the correct size and did not move at high flows, was placed too high on the bank for the stream to wash into the culvert, and when the material was taking too long to work its way into the pipe. There is also a question of whether the surcharged material has the potential to block fish passage upstream. Due to these results, it is now recommended to mechanically place bedload material directly into the pipe instead of surcharging upstream.

The SSS design contrasts with stream simulation design in a few important ways. Stream simulation design typically entails a more comprehensive stream survey and engineering analysis which potentially reduces the risk of adverse effects. The most noticeable visual difference is an improved matching of the natural channels, roughness, bedform, diversity of stream velocities, depths and widths due to the greater attention to bedload size selection and placement within the culvert of a steam simulated designed structure.

The SSS design is an experimental design concept and monitoring is conducted annually by Tongass personnel on installations that are yellow, red, or have been green for only one year. Fourteen SSS designed culverts were monitored in 2016 and 18 were monitored in 2017 (Table 2).

During 2014 the 9 SSS culverts installed in 2012 and 2013 were also evaluated by the Forest Service's Washington Office Virtual AOP Design Assistance Team (Gubernick and Weinhold 2015). The intent of this review was to look at how well the structures were performing and gain insight on how subsequent SSS installations might be modified in the following years. Some of the recommendations from the review have already been incorporated into several 2015 MEAOP installations.

SSS- 2015 Installations

Road 2050000 milepost 5.780 (photo 4)

Design specifications required that 6" minus surcharged material be placed in the channel upstream of the culvert. The installation was found to be Yellow and adequate for fish passage (table 3). No surcharged material remains upstream of the culvert following a high flow. The middle part of the culvert is lacking bedload cover but is backwatered in the area with no bedload. In the 2016 and 2017 pictures, sediment can be seen at the upstream end of the culvert that has yet to work it's way towards the middle of the culvert. It is recommended to continue to monitor this culvert until bedload has established throughout the culvert.

Table 3. Road 2050000 milepost 5.780; culvert specifications

Size	46" x 60" x 30'
Culvert gradient/natural channel gradient	4.5 percent / 5.0 percent
Percent of culvert length with bedload material	2015: 100 percent 2016 & 2017: 75%
Bedload depth to culvert rise proportion at inlet/outlet	2015: 0.06 / 0.14 2016: 0.09/0.17 2017: 0.11/0.17
Bedload particle size in culvert/natural channel	Cobble Gravel Sand / Cobble Gravel
Culvert width to channel bedwidth proportion	2015: 0.97 2016: 1.14 2017: 1.47
Outlet perch present	No
Backwatered flow conditions	2015: 80 percent of length 2017: 60 percent of length
Headcutting evident	No
Debris blockage present	No

Photo 4. SSS designed culvert, road 2050000 milepost 5.780

Culvert outlet, looking upstream

Culvert inlet, looking downstream 2017

Culvert barrel looking upstream

Culvert barrel looking downstream 2015

Culvert barrel looking upstream

Culvert barrel looking downstream 2016

Culvert barrel looking upstream

Culvert barrel looking downstream 2017

Road 2050000 milepost 6.620 (Photo 5)

Approximately 6" minus surcharged material was placed in the channel upstream of the culvert. The installation was found to be Yellow and adequate for fish passage (table 4). No surcharged material remains upstream of the culvert following a high flow. The culvert is too short resulting in road fill spilling into the creek. Boulder grade controls upstream of culvert are very big and placed at a steep grade, more gradual steps over a longer distance is preferred. It is recommended to continue to monitor this culvert until bedload has established throughout the culvert.

Table 4. Road 2050000 milepost 6.620; culvert specifications

Size	46" x 60" x 30'
Culvert gradient/natural channel gradient	3.3 percent / 6.0 percent
Percent of culvert length with bedload material	100 percent
Bedload depth to culvert rise proportion at inlet/outlet	2015: 0.17 / 0.13 2016: 0.22/0.14 2017:0.14/0.14
Bedload particle size in culvert/natural channel	Gravel Sand Cobble / Sand Gravel
Culvert width to channel bedwidth proportion	2015: 0.81 2016: 0.82 2017: 1.43
Outlet perch present	No
Backwatered flow conditions	2015: 30 percent of length 2016 & 2017: 25%
Headcutting evident	No
Debris blockage present	No

Photo 5. SSS designed culvert, road 205000 milepost 6.620

Culvert outlet, looking upstream 2015

Culvert inlet, looking downstream 2015

Culvert barrel, looking upstream 2015

Culvert barrel, looking downstream 2015

Road 2050200 milepost 0.220 (Photo 6)

Approximately 6" minus surcharged material was placed in the channel upstream of the culvert. This culvert has 5 baffles installed that alternate sides creating a sinuous channel in the culvert and helping to retain bedload. No surcharged material remains upstream of the culvert following a high flow. There is bedrock present just upstream of the culvert and the upstream grade control was placed on top of that bedrock. This grade control was not needed since there was already a natural stable bedrock control. The installation was found to be Gray since it has baffles but it assumed to be adequate for fish passage (table 5).

Table 5. Road 2050200 milepost 0.220; culvert specifications

Size	55" x 73" x 64'
Culvert gradient/natural channel gradient	4.6 percent / 6.0 percent
Percent of culvert length with bedload material	100 percent
Bedload depth to culvert rise proportion at inlet/outlet	2015: 0.01 / 0.21 2016: 0.01/0.19 2017: 0.11/0.21
Bedload particle size in culvert/natural channel	Cobble Gravel / Cobble Gravel
Culvert width to channel bedwidth proportion	2015: 0.88 2016: 0.85 2017: 1.19
Outlet perch present	No
Backwatered flow conditions	40 percent of length
Headcutting evident	No
Debris blockage present	No

Photo 6. SSS designed culvert, road 2050200 milepost 0.220

Culvert outlet, looking upstream 2017

Culvert inlet, looking downstream 2015

Culvert barrel, looking upstream 2017

Culvert barrel, looking downstream 2015

Road 3000000 milepost 23.490 (Photo 7)

This culvert has baffles installed that are notched on alternating sides to create sinuous flow and to help retain bedload since the gradient of the culvert is so high (table 6). The installation is automatically Gray because it has baffles. Bedload is lacking at the outlet as shown in the picture below. A grade control on the downstream of the pipe might help to raise the grade and backwatered the outlet. The culvert is shorter then what was needed resulting in road fill spilling into the stream on the inlet side.

Table 6. Road 3000000 milepost 23.490; culvert specifications

Size	60” x 60” x 43’
Culvert gradient/natural channel gradient	9.6 percent / 10.0 percent
Percent of culvert length with bedload material	2015: 100 percent 2016: 96%
Bedload depth to culvert rise proportion at inlet/outlet	2015: 0.32/0.00 2016: 0.36/0.00
Bedload particle size in culvert/natural channel	Cobble Gravel / Gravel Sand
Culvert width to channel bedwidth proportion	1.06
Outlet perch present	No
Backwatered flow conditions	0 percent of length
Headcutting evident	No
Debris blockage present	No

Photo 7. SSS designed culvert, road 3000000 milepost 23.490

Culvert outlet, looking upstream 2017

Culvert inlet, looking downstream 2017

Culvert barrel, looking upstream 2015

Culvert barrel, looking downstream 2015

Road 3030100 milepost 0.250 (Photo 8)

Approximately 3" minus surcharged material was placed in the channel upstream of the culvert. The installation was found to be Green and adequate for fish passage (table 7).

Table 7. Road 3030100 milepost 0.250; culvert specifications

Size	36" x 36" x 30'
Culvert gradient/natural channel gradient	4.0 percent / 8.0 percent
Percent of culvert length with bedload material	100 percent
Bedload depth to culvert rise proportion at inlet/outlet	2015: 0.22 / 0.36 2016: 0.17/0.30
Bedload particle size in culvert/natural channel	Gravel Cobble / Gravel Cobble Sand
Culvert width to channel bedwidth proportion	0.97
Outlet perch present	No
Backwatered flow conditions	0 percent of length
Headcutting evident	No
Debris blockage present	No

Photo 8. SSS designed culvert, road 3030100 milepost 0.250

Culvert outlet, looking upstream 2015

Culvert inlet, looking downstream 2015

Road 3030100 milepost 0.280 (Photo 9)

No surcharge was placed at the inlet of this stream. The installation was found to be Gray for fish passage due to constriction (table 8). It was noted that the culvert could have also been countersunk to a deeper depth. The widest part of the culvert has not been taken advantage of and is out of the water as shown in the picture of the barrel below. This is a new crossing at this location and was installed to improve drainage and realign flow. This road was originally constructed with a minimal number of culverts and a large berm on the outboard side of the road resulted in 700 meters of water diverted to the ditch. Fish were present in the ditch before this culvert was put in so the crossing is assumed to be a fish crossing. It is now connected to an old abandoned channel downstream.

Table 8. Road 3030100 milepost 0.280; culvert specifications

Size	60” x 60” x 40’
Culvert gradient/natural channel gradient	2.9 percent / 7.0 percent
Percent of culvert length with bedload material	2015: 100 percent 2016: 95% 2017: 100%
Bedload depth to culvert rise proportion at inlet/outlet	2015: 0.22 / 0.21 2016: 0.13/0.22 2017: 0.13/0.18
Bedload particle size in culvert/natural channel	Cobble Gravel / Cobble Gravel
Culvert width to channel bedwidth proportion	2015 & 2016: 0.92 2017: 0.7
Outlet perch present	No
Backwatered flow conditions	2015: 60 percent of length 2016 % 2017: 30%
Headcutting evident	No
Debris blockage present	No

Photo 9. SSS designed culvert, road 3030100 milepost 0.280

Culvert outlet, looking upstream 2015

Culvert inlet, looking downstream 2015

Culvert inlet, looking downstream 2017

Culvert barrel, looking upstream 2017

Road 3030100 milepost 0.380 (Photo 10)

No surcharge was placed at the inlet of this culvert. The installation was found to be Yellow and adequate for fish passage (table 9) but needs to be monitored on a frequent basis due to insufficient bedload cover. Bedload increased from 20% to 50% between 2015 and 2017. During monitoring it was noted that the culvert could have been countersunk further down due to the widest part of the culvert not being taken advantage. This is a new crossing and was installed to improve drainage and realign flow. This road was originally constructed with a minimal number of culverts and a large berm on the outboard side of the road which resulted in 700 meters of water diverted to the ditch. Fish were present in the ditch before this culvert was put in so the crossing is assumed to be a fish crossing. It is now connected to an abandoned channel downstream.

Table 9. Road 3030100 milepost 0.380; culvert specifications

Size	30” x 40” x 35’
Culvert gradient/natural channel gradient	1.5 percent / 15.0 percent
Percent of culvert length with bedload material	2015: 20 percent 2017: 50%
Bedload depth to culvert rise proportion at inlet/outlet	2015: 0.06 / 0.20 2017: 0.08 / 0.16
Bedload particle size in culvert/natural channel	Gravel Organic / Cobble Gravel

Culvert width to channel bedwidth proportion	2015: 1.11 2017: 1.08
Outlet perch present	No
Backwatered flow conditions	50 percent of length
Headcutting evident	No
Debris blockage present	No

Photo 10. SSS designed culvert, road 3030100 milepost 0.380

Culvert barrel, looking downstream 2017

Culvert barrel, looking upstream 2017

Culvert inlet, looking downstream 2017

Culvert outlet, looking upstream 2017

Road 3030100 milepost 0.750 (Photo 11)

No surcharge was placed at the inlet of this culvert. The installation was monitored in 2016 and was found to be Green and adequate for fish passage (table 10).

Table 10. Road 3030100 milepost 0.750; culvert specifications

Size	70” x 90” x 45’
Culvert gradient/natural channel gradient	1.0 percent / 1.0 percent
Percent of culvert length with bedload material	100 percent

Bedload depth to culvert rise proportion at inlet/outlet	2015: 0.07 / 0.13 2016: 0.07 / 0.16
Bedload particle size in culvert/natural channel	Gravel Sand/ Gravel Sand Cobble
Culvert width to channel bedwidth proportion	2015: 1.22 2016: 0.87
Outlet perch present	No
Backwatered flow conditions	100 percent of length
Headcutting evident	No
Debris blockage present	No

Photo 11. SSS designed culvert, road 3030100 milepost 0.750

Culvert outlet, looking upstream 2016

Culvert inlet, looking downstream 2015

SSS – Sitka 2015 Installations

Five SSS culverts were installed on the Sitka District in 2015 on the False Island road system. Monitoring occurred in 2015 and 2017. The designs for all five of these sites had the same skew on the culvert, stream location, and surcharge locations. It appears that no stream surveys were conducted on any of these sites prior to the culverts being designed which resulted in two Red sites and one Gray site. Several of the sites had surcharge placed on the inlet side of the culvert in areas where it will never get washed into the culvert. Additionally 4 of the 5 culverts did not have bedload cover throughout the culvert. The infilled bedload at the inlet and outlet has remained where placed due to the lack of stream power to mobilize the sediment through the culvert.

Road 7540FI milepost 4.428 (Photo 12)

This culvert is placed perpendicular to stream flow to catch ditch flow that is entering from the left side. Cobble surcharge was placed directly across from the inlet of this culvert and will not enter the culvert due to the placement location that does not get flow (Photo 11). Stream location on design drawings for this site does not match what is on the ground nor does the surcharge location. The same typical was used for all 2015 installations on the 7540FI and 7544 roads which depicts a stream that does not match what is on the ground. The design called for infill to be placed 6 feet from each end of the culvert. As of 2017, bedload has not moved and remains where it was placed during installation. The culvert is backwatered in the area without bedload due to height of the bedload at outlet and inlet which is creating backwater conditions in the middle of the culvert. The installation was found to be Yellow and adequate for fish passage (table 13) due to it being backwatered where there is no bedload. Continued monitoring is needed

to ensure that bedload moves through the culvert It is apparent from looking at the design that no stream survey took place at this site prior to the design. Although the installation is adequate for fish passage, more attention needs to put towards quality designs with surveys that depict what is actually on the ground.

Table 11. Road 7540FI milepost 4.428; culvert specifications

Size	48” x 48” x 29’
Culvert gradient/natural channel gradient	0.6 percent / 5.0 percent
Percent of culvert length with bedload material	2015: 20 percent 2017: 30%
Bedload depth to culvert rise proportion at inlet/outlet	2015: 0.32 / 0.30 2017: 0.30/0.29
Bedload particle size in culvert/natural channel	Gravel Sand / Sand Organic
Culvert width to channel bedwidth proportion	1.21
Outlet perch present	No
Backwatered flow conditions	80 percent of length
Headcutting evident	No
Debris blockage present	No

Photo 12. SSS designed culvert, road 7540FI milepost 4.428

Culvert outlet, looking upstream, 2015

Culvert inlet, looking downstream, 2017

Culvert barrel, looking upstream 2017

Culvert inlet looking up, surcharge location, 2017

Road 7540FI milepost 4.480 (Photo 13)

The installation was found to be Red and not adequate for fish passage due to insufficient bedload at the outlet (table 12). The culvert is misaligned to the stream due to the stream running in the ditch. The outlet of the culvert is too long and could have been skewed more to use up some of the length and align with the stream more. The design stream location does not match what is on the ground.

Table 12. Road 7540FI milepost 4.480; culvert specifications

Size	48” x 48” x 44’
Culvert gradient/natural channel gradient	2.0 percent / 5.0 percent
Percent of culvert length with bedload material	99 percent
Bedload depth to culvert rise proportion at inlet/outlet	2015: 0.21 / 0.16 2017: 0.19 / 0.00
Bedload particle size in culvert/natural channel	Cobble Gravel / Gravel Cobble
Culvert width to channel bedwidth proportion	2015: 0.73 2017: 1.21
Outlet perch present	No
Backwatered flow conditions	0 percent of length
Headcutting evident	No
Debris blockage present	No

Photo 13. SSS designed culvert road 7540FI milepost 4.480


Culvert outlet, looking upstream, 2015


Culvert inlet, looking downstream, 2015


Culvert outlet, downstream 2017


Culvert outlet, looking upstream 2017

Road 7540FI milepost 4.554 (Photo 14)

The stream at this culvert runs along the ditch for approximately 400 feet before entering the culvert. Cobble surcharge was placed across from the culvert and will likely remain there instead of entering the culvert due to the placement location. The culvert is misaligned to stream due to the stream flowing in ditch. Surcharge that was infilled in the inlet and outlet of the pipe still remain where placed and none has moved to the middle of the pipe which is bare but backwatered. The design stream location does not match what is on the ground. The installation was found to be Gray for fish passage (table 13) due to constriction.

Table 13. Road 7540FI milepost 4.554; culvert specifications

Size	48” x 48” x 36’
Culvert gradient/natural channel gradient	1.3 percent / 3.0 percent
Percent of culvert length with bedload material	2015: 15% 2017: 20 percent
Bedload depth to culvert rise proportion at inlet/outlet	2015: 0.37 / 0.36 2017: 0.40 / 0.34
Bedload particle size in culvert/natural channel	Gravel Cobble Sand / Cobble Gravel Sand
Culvert width to channel bedwidth proportion	0.73
Outlet perch present	No
Backwatered flow conditions	85 percent of length
Headcutting evident	No
Debris blockage present	No

Photo 14. SSS designed culvert, road 7540FI milepost 4.554

Culvert outlet, looking upstream 2015

Culvert inlet, looking downstream 2017

Culvert barrel, looking upstream 2017

Culvert inlet, looking upstream 2017

Road 7540FI milepost 6.787 (Photo 15)

The infill placed at the inlet and outlet remains where placed and none has moved towards the middle of the culvert which is currently bare but backwatered. The infill has created a berm that could block fish at some flows due to its height and subsurface flow that is occurring through it. The culvert is also poorly aligned to the stream. The installation was found to be Red and not adequate for fish passage due infill causing a berm and subsurface flow at the inlet and outlet (table 14). Additional work at this site could remediate the problem. The infill at the inlet needs to be pushed further in the culvert. Since the stream comes in to this culvert at a 90 degree angle and there is a high bank present, heavy equipment could not be used to push the sediment through. It is recommended that a hand crew push sediment further into the culvert using hand tools.

Table 14. Road 7540FI milepost 6.787; culvert specifications

Size	48” x 48” x 40’
Culvert gradient/natural channel gradient	5.2 percent / 6.0 percent
Percent of culvert length with bedload material	20 percent
Bedload depth to culvert rise proportion at inlet/outlet	2015: 0.35 / 0.35 2017: 0.36/0.33
Bedload particle size in culvert/natural channel	Cobble / Gravel
Culvert width to channel bedwidth proportion	1.11
Outlet perch present	No
Backwatered flow conditions	2015: 0 percent of length 2017: 80%
Headcutting evident	No
Debris blockage present	No

Photo 15. SSS designed culvert, road 7540FI milepost 6.787

Culvert outlet, looking upstream 2015

Culvert inlet, looking downstream 2015


Culvert barrel, looking upstream 2017


Culvert inlet, looking upstream 2017

Road 7544 milepost 1.030 (Photo 16)

The installation was found to be Green and adequate for fish passage (table 15). No placed surcharge is remaining at the inlet. The culvert is backwatered due to placed bedload at the inlet and outlet. A grade control log was placed upstream of this installation but was not buried to an adequate depth so has been scoured underneath rendering it non-functional.

Table 15. Road 7544 milepost 1.030; culvert specifications

Size	60” x 60” x 35’
Culvert gradient/natural channel gradient	1.0 percent / 4.0 percent
Percent of culvert length with bedload material	2015: 15 percent 2017: 20%
Bedload depth to culvert rise proportion at inlet/outlet	2015: 0.39 / 0.39 2017: 0.54 / 0.49
Bedload particle size in culvert/natural channel	Gravel Sand / Gravel Sand
Culvert width to channel bedwidth proportion	1.79
Outlet perch present	No
Backwatered flow conditions	2015: 95 percent of length 2017:90%
Headcutting evident	No
Debris blockage present	No

Photo 16. SSS designed culvert, road 7544 milepost 1.030

Culvert outlet, looking upstream 2015

Culvert inlet, looking downstream 2015

Culvert barrel, looking upstream 2017

Culvert barrel, looking downstream 2017

SSS – 2014 Installations

The Seven 2014 SSS installed culverts were monitored in 2014, 2015, and 2017. Five were monitored in 2016.

Road 6259 milepost 2.334 (Photo 17)

Approximately 6 inch minus surcharged material was placed in the channel upstream of the culvert. Finer surcharge material is evident downstream of culvert. The installation was found to be Red and not be adequate for fish passage (Table 16) in 2017 because of lack of substrate depth at the inlet and no backwater in the area without bedload.

Table 16. Road 6259 milepost 2.334; culvert specifications

Size	60” x 90” x 42’
Culvert gradient/natural channel gradient	2.5 percent / 4.0 percent
Percent of culvert length with bedload material	2014 & 2015: 100 percent 2017: 95%
Bedload depth to culvert rise proportion at inlet/outlet	2014: 0.06 / 0.32 2015: 0.04/0.36 2017: 0.02 / 0.30
Bedload particle size in culvert/natural channel	Cobble Boulder / Gravel Sand Cobble
Culvert width to channel bedwidth proportion	1.14

Outlet perch present	No
Backwatered flow conditions	0 percent of length
Headcutting evident	No
Debris blockage present	No

Photo 17. SSS designed culvert road 6259 milepost 2.334

Culvert outlet, looking downstream, 2014

Culvert outlet looking downstream, 2015

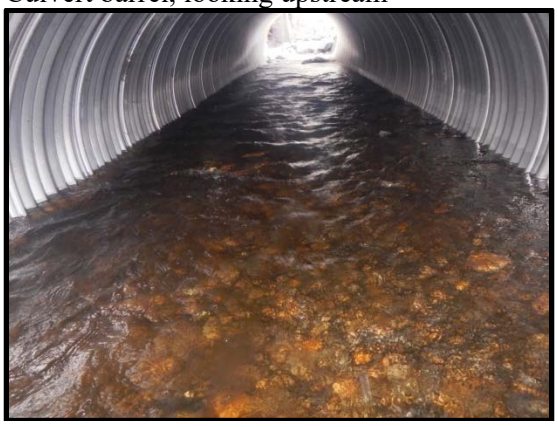
Culvert inlet, looking downstream

2014

2015

2017

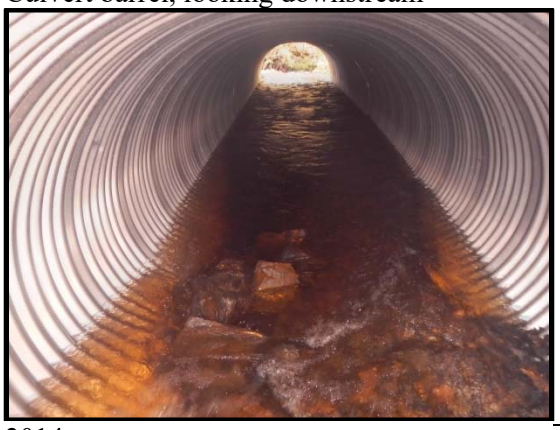
Culvert barrel, looking upstream



2014

2017

Culvert barrel, looking downstream



2014

2017

Road 6259 milepost 2.782 (Photo 18)

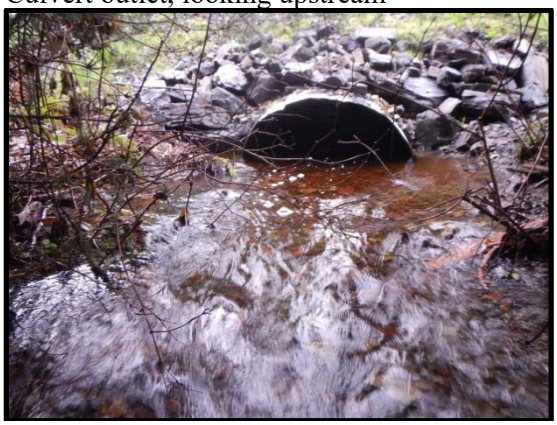
Design specifications required that 1.5" minus surcharged material be placed in the channel upstream of the culvert. The installation was found to be Red and not adequate for fish passage in 2017 due to constriction (table 17). The constriction is creating a wedge of sediment at the inlet of the culvert. The inlet is also poorly armoured. Less than 1 cubic yard of the surcharged material remains upstream of the culvert following a high flow. The majority of the surcharge in the culvert is native. Bedload coverage decreased from the previous year.

Table 17. Road 6259 milepost 2.782; culvert specifications

Size	43"x52"x38'
Culvert gradient/natural channel gradient	3.6%/3.0%
Percent of culvert length with bedload material	2014: 100% 2015: 66% 2016: 95% 2017: 62%
Bedload depth to culvert rise proportion at inlet/outlet	2014: 0.11/0.39 2015: 0.11/0.33 2016: 0.08 / 0.08 2017: 0.14 / 0.00
Bedload particle size in culvert/natural channel	Cobble Gravel /Gravel, Cobble
Culvert width to channel bedwidth proportion	0.05
Outlet perch present	No
Backwatered flow conditions	2014: 98% of length 2015: 95% 2016: 90% 2017: 100%
Headcutting evident	Yes
Debris blockage present	No

Photo 18. SSS designed culvert, road 6259 milepost 2.782

Culvert outlet, looking upstream



2014

2015

Culvert inlet, looking downstream

2014

2015

Culvert barrel, looking downstream

2014

Culvert barrel, looking downstream

2017

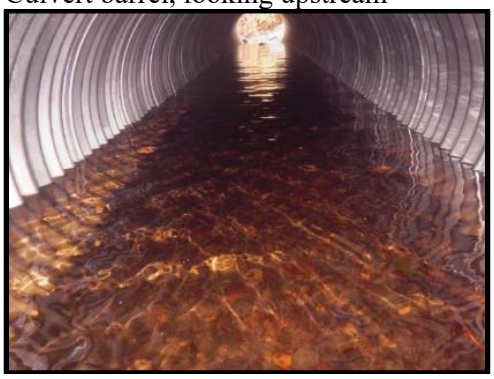
Road 6259 milepost 2.787 (Photo 19)

Design specifications required that 1.5 inches minus surcharged material be placed in the channel upstream of the culvert. The installation was found to be Yellow and adequate for fish passage because area without bedload is backwatered (Table 18). Bedload has become more concentrated in the middle of the pipe with the edges of the pipe becoming bare. Approximately 2 cubic yards of the surcharged material remains upstream of the culvert following a high flow.

Table 18. Road 6259 milepost 2.787; culvert specifications

Size	44” x 51” x 40’
Culvert gradient/natural channel gradient	2.2 percent / 3.0 percent
Percent of culvert length with bedload material	2014: 70 percent 2015: 95 percent 2017: 66%
Bedload depth to culvert rise proportion at inlet/outlet	2014: 0.0/0.26 2015: 0.0/0.21 2017: 0.00 / 0.10
Bedload particle size in culvert/natural channel	Gravel Sand / Gravel Cobble Organic
Culvert width to channel bedwidth proportion	0.87
Outlet perch present	No
Backwatered flow conditions	100 percent of length
Headcutting evident	No
Debris blockage present	No

Culvert barrel, looking upstream



2014

2017

Photo 19. SSS designed culvert, Road 6259 milepost 2.787

Culvert barrel, looking downstream

2014

2017

Road 50054 milepost 0.033 (Photo 20)

Design specifications required that 1.5 inches minus surcharged material be placed in the channel

upstream of the culvert. The installation was found to be Red and not to be adequate for fish passage due to lack of bedload (Table 19). A headcut is present upstream. There is deposition downstream of the culvert due to the previous undersized culvert. Culvert is poorly aligned to the stream and a small stream joins the main stream right at the inlet. The headcut upstream is caused by buildup up of past logging debris and the sediment wedge that was removed during culvert installation.

Table 19. Road 50054 milepost 0.033; culvert specifications

Size	44” x 53” x 33’
Culvert gradient/natural channel gradient	2.2 percent / 9.0 percent
Percent of culvert length with bedload material	0 percent
Bedload depth to culvert rise proportion at inlet/outlet	2014: 0.07 / 0.12 2015, 2016 & 2017: 0.0 / 0.0
Bedload particle size in culvert/natural channel	None / Gravel, Cobble, Organic
Culvert width to channel bedwidth proportion	0.66
Outlet perch present	No
Backwatered flow conditions	50 percent of length
Headcutting evident	Yes
Debris blockage present	No

Culvert outlet, looking upstream

2014

2015

2016

Culvert inlet, looking downstream

2014

2015

2017

Culvert barrel, looking upstream

December 16, 2019

The Honorable Sonny Perdue
U.S. Department of Agriculture
1400 Independence Ave., S.W.
Washington, D.C. 20250

Ms. Vicki Christiansen
U.S. Forest Service
1400 Independence Ave., S.W.
Washington, D.C. 20250

Dear Secretary Perdue and Ms. Christiansen,

We are outfitters and guides, tour operators, gear manufacturers and retailers, sportsmen organizations, and conservation groups that value and depend on the Tongass National Forest. We employ hundreds of southeast Alaskans, have tens-of-thousands of Alaskan supporters, and cater to customers that travel to the Tongass for its world-class fish and wildlife, recreation values, subsistence resources, and for the economic opportunities roadless areas provide. The proposed Alaska Roadless Rule and decisions about how to manage the Tongass have a direct and profound impact on us, our customers, and our members.

The proposed Alaska Roadless Rule, which would fully exempt the Tongass, is a huge leap backward and risks undoing much of the progress gained through hard compromise and collaboration in recent years. It turns its back to the region's economic strengths, fishing, tourism and outdoor recreation, which now account for 26% of regional employment and $2 billion to the local economy, and short changes the values that make the Tongass so unique and valuable to local residents and visitors alike. Exempting the Tongass from the Roadless Rule unnecessarily courts conflict and empowers the most extreme voices while obstructing more productive and mutually beneficial pathways to the future. The Forest Service should abandon its proposed exemption and, instead, maintain protections for roadless areas within the Tongass.

Many of us work directly with the Forest Service, either through special use permits to operate on the Tongass, as project partners, or as visitors, hunters, anglers, and subsistence users. Our ability to fulfill our missions and meet the needs of our customers, and the Forest Service's ability to meet the needs of the public, are directly tied to one another. Either we succeed as stewards of our public lands together with the Forest Service, or we standby as turmoil over management decisions grows and forest values are degraded.

Many of the undersigned parties have long supported efforts by the Forest Service to transition the Tongass from unsustainable old-growth logging to management focused on fish and wildlife, tourism and recreation, and a sustainable young-growth forest products industry. We cheered the original transition announcement in 2010, worked tirelessly in support of the 2016 amendment to the Tongass Land Management Plan, and have supported its implementation since. Although compromise can be difficult, the need to move beyond the persistent conflict that has clouded the Tongass for decades is paramount.

Roadless areas on the Tongass are some of the best and most valuable lands on the forest. Many of the most important salmon streams are in roadless areas. Increasingly scarce winter deer range and prime bear habitat is often found in low elevation roadless areas. Roadless areas offer the right combination of beautiful scenery, wild landscapes, fish and wildlife, and access that our growing tourism and recreation industry demands. The Roadless Rule's protections for these unique values give our businesses and organizations a level of certainty upon which we base our business investments and hiring decisions.

The Tongass is a paradise—not just for Alaskans, but for all Americans. Roadless areas in the Tongass contain much of the region's most productive wildlife habitat, quality salmon habitat and clean water, and recreation opportunity. Any durable and long-lasting solution to the persistent land-management challenges on the Tongass must be based on collaboration and care for the important fish, wildlife, recreation, subsistence and scenic values that make the Tongass unique among our public lands. The proposed Alaska Roadless Rule fails on this measure. We encourage the Forest Service to listen to the overwhelming weight of public comment, the needs of businesses and organizations like ours, and to not exempt the Tongass from the Roadless Rule.

Sincerely,

Above and Beyond Alaska
Becky Janes, Owner
Juneau, AK

Hatch Outdoors Inc
Andrew Dickinson, General Manager
Vista, CA

Alaska Charter Service
Travis Peterson, Owner
Sitka, AK

Alaska Fly Fishing Goods
Brad Elfers, Owner
Juneau, AK

Alaska Fly Out Travel
Cory Luoma, Owner
Columbia Falls, MT

Alaska Kenai Fishing For Fun
Brad Kirr, Owner & Guide
Soldotna, AK

Allen Fly Fishing
A.J. Gottschalk, Vice President
Southlake, TX

American Fly Fishing Trade Association
Ben Bulis, President and CEO
Bozeman, MT

Angler Action Foundation
Brett Fitzgerald, CEO
Lake Worth Beach, FL

August Island Pictures
Mark Titus, Writer and Director
Seattle, WA

Backcountry Hunters & Anglers
John Gale, Conservation Director
Missoula, MT

Baranof Wilderness Lodge
Mike & Sally Trotter, Owners
Sitka, AK

Bear Creek Outfitters
Arne Johnson, Owner
Juneau, AK

Cascadia Guide, Inc
Eric Neufeld, Co-Owner
Spokane, WA

Lakeview Outfitters
TJ Dawson & Phil Hilbruner, Owners & Guides
Cooper Landing, AK

Lindblad Expeditions
Craig Moylan, Director of Expedition
Development, North and South America
Seattle, WA

Loon Outdoors
Brett Zundel, Owner / Director of Sales
Boise, ID

Maven Outdoor Equipment Company
Brendon Weaver, Co-owner/Design/Marketing
Lander, WY

Mossy's Fly Shop
Mike Brown, Owner
Anchorage, AK

National Deer Alliance
Nick Pinizzotto, President and CEO
Indiana, PA

National Outdoor Leadership School
Chris Brauneis, Alaska Branch Director
Palmer, AK

Nautilus Reels
Kristen Mustad, Owner
Miami, FL

Orvis
Simon Perkins, COO
Sunderland, VT

Pioneer Studios
Ben Hamilton, Owner
San Antonio, Texas

Pybus Point Lodge
Scott Jorgenson, Owner
Pybus Bay, AK

Quality Deer Management Association
Kip Adams, Director of Conservation
Bogart, GA

C.F. Burkheimer Fly Rod Company
Carl “Kerry” Burkheimer, President
Washougal, WA

Chrome Chasers
Rick Matney, Owner
Wrangell, AK

Chugach Backcountry Fishing
Corey Hetrick, Owner
Moose Pass, AK

Coastal Alaska Adventures
Keegan McCarthy, Owner
Douglas, AK

Coastal Alaska Safaris
Chad Poppe, Owner
Wrangell, AK

Custom Alaska Cruises
Keegan McCarthy, Owner
Douglas, AK

Chota Outdoor Gear
Mark Brown, General Manager
Knoxville, TN

Cooper Landing Fishing Guide, LLC
David Lisi, Owner & Guide
Cooper Landing, AK

The Drake
Tom Bie, Owner
Denver, CO

DRYFT
Nick Satushek, President
Bellingham, WA

Eva’s Wild
Mark Titus, Owner
Seattle, WA

Expedition Broker
Greg Schlacter, Owner
Haines, AK

Raging River Sales
Eric Neufeld, Owner
North Bend, WA

Rajeff Sports / ECHO Flyfishing
James Lemon, Marketing
Vancouver, WA

Redington
Jay Beebe, Community Manager
Bainbridge Island, WA

Red’s Fly Shop
Joe Rotter, Partner
Ellensburg, WA

RIO Products
Simon Gawesworth, Brand Manager
Idaho Falls, ID

Sage Fly Fishing
David Lantz, Marketing Manager
Bainbridge Island, WA

Sawyer Paddles and Oars
Derek Young, Northern US Territory Manager
Gold Hill, OR

Scientific Anglers
Brad Befus, President
Midland,MI

Scott Fly Rod Company
Jim Bartschi, President
Montrose, CO

Seek Outside
Angie Timm, Founder and Co-owner
Grand Junction, CO

Simms Fishing Products
K.C. Walsh, Executive Chairman
Casey Sheahan, CEO
Diane Bristol, Sr. Director of Community Engagement
Bozeman, MT

El Capitan Lodge
Scott Van Valin, Owner
Craig, AK

Far Bank Enterprises
Tag Kleiner, VP of Marketing
Bainbridge Island, WA

First Lite
Ford Van Fossan, Conservation, Content and Digital Merchandising Manager
Ketchum, ID

Fishpond, INC
Ben Kurtz, President
John Land Le Coq, Founder and CEO
Denver, CO

Fly Fishers International
Dave Peterson, Chair Conservation Committee
Livingston, MT

The Flyfish Journal
Jeff Galbraith, Publisher
Bellingham, WA

The Fly Fishing Show
Ben Furimsky, President/CEO
Somerset, PA

The Fly Shop
Pat Pendergast, Director of International Travel
Redding, CA

Fly Water Travel
Ken Morrish, Director of Travel Sales
Ashland, OR

Frontiers International Travel
Mike Fitzgerald, President
Wexford, PA

Gastineau Guiding
Sierra Gadaire, Operations Manager
Juneau, AK

Sitka Conservation Society
Andrew Thoms, Executive Director
Sitka, AK

Sitka Fish Outfitters
Jamie Steinson, Owner
Sitka, AK

Sitka Gear
Thaddeus Kaczmarek, Consumer Experience Leader
Bozeman, MT

SpeyCo Fly Reels
Tim Pantzlaff, Owner
Green Bay, WI

Stanley-PMI
Michelle Flemming, Marketing Manager
Seattle, WA

TFO, LLC
Rick Pope, Chairman
Dallas, TX

Theodore Roosevelt Conservation Partnership
Joel Webster, Center for Western Lands Director
Missoula, MT

Thomas and Thomas
Joe Goodspeed, Product Development Manager
Greenfield, MA

Treasure Hunter Lodge
Kurt Whitehead and Trina Nation, Owners
Klawock, AK

Trout Unlimited
Austin Williams, Alaska Director of Law and Policy
Anchorage, AK

Umpqua Feather Merchants
Russell Miller, Director of Marketing
Louisville, CO

Uncruise Adventures
Dan Blanchard, Owner
Juneau, AK

Glacier Guides, Inc.
Alisha “Mutts” and Zach Decker, Owners
Glacier Bay, AK

goHUNT
Chris Porter, COO
Las Vegas, NV

Harper Studios
Earl Harper, Owner
Seattle, WA

Hatch Magazine
Chad Shmukler, Editor
Philadelphia, PA

Vortex Optics
Mark Boardman, Director of Marketing
Barneveld, WI

Wildlife Forever
Pat Conzemius, President & CEO
White Bear Lake, MN

Yellow Dog Flyfishing Adventures
Jim Klug, Director of Operations
Bozeman, MT

Poll Findings:
Alaska Tongass Forest

Presented by: Kiel Brunner
Tulchin Research
May 21, 2019

Methodology

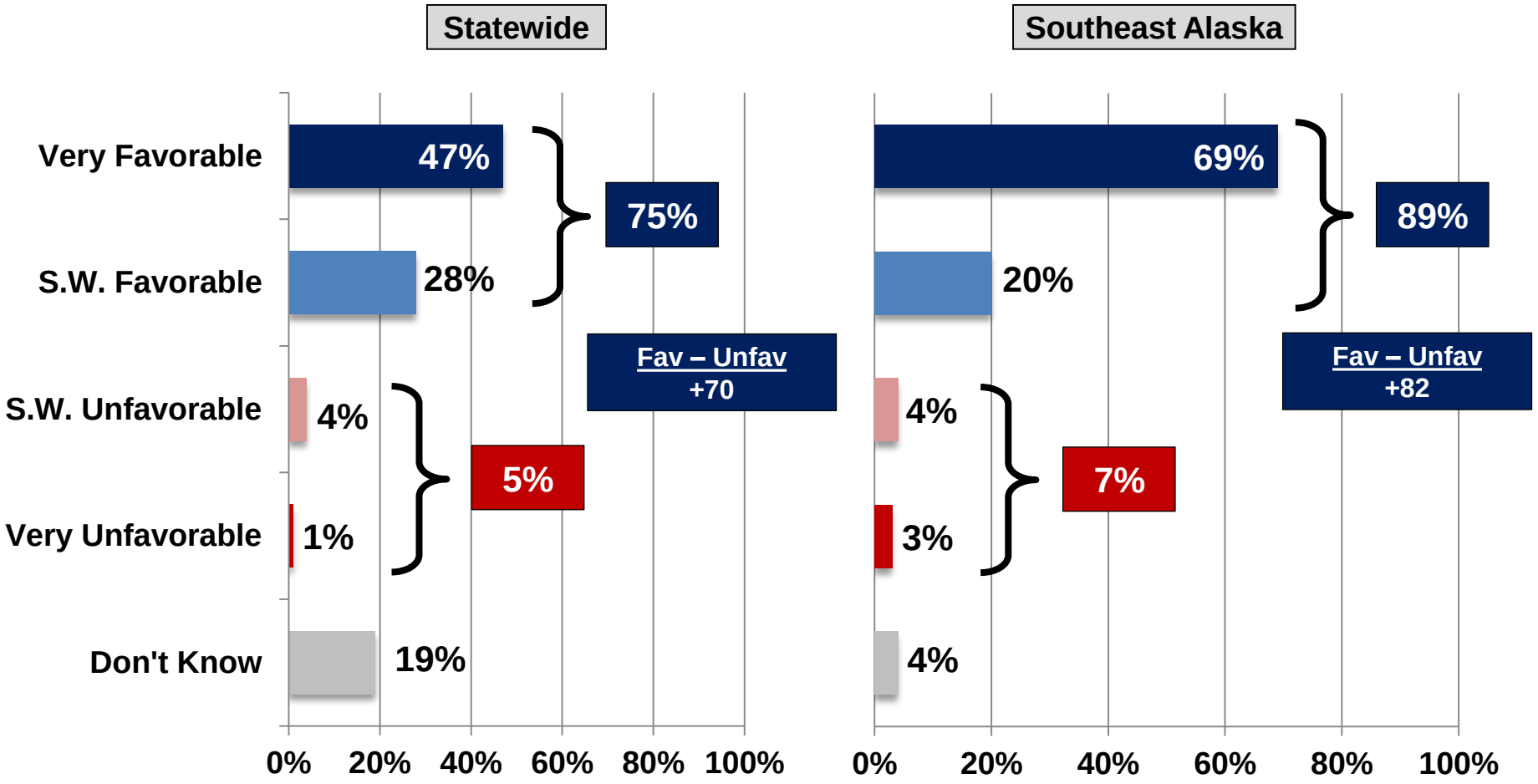
- **Statewide survey in Alaska with an oversample in Southeast Alaska**
  - **Alaska Statewide: n400 Likely Voters**
    - **The margin of error for the base sample is ± 4.9%.**
  - **Southeast Alaska: n172 Likely Voters**
    - **n150 Oversample and n22 from Base sample**
    - **The margin of error for the oversample of SE Alaskans is ± 7.46%**

- **Multi-Modal:**
  - **Live phone interviews conducted by professional callers dialing both landlines and cell phones as well as interviewing a portion of respondents online through e-mails from the voter file.**

- **Fielded April 19-28, 2019.**

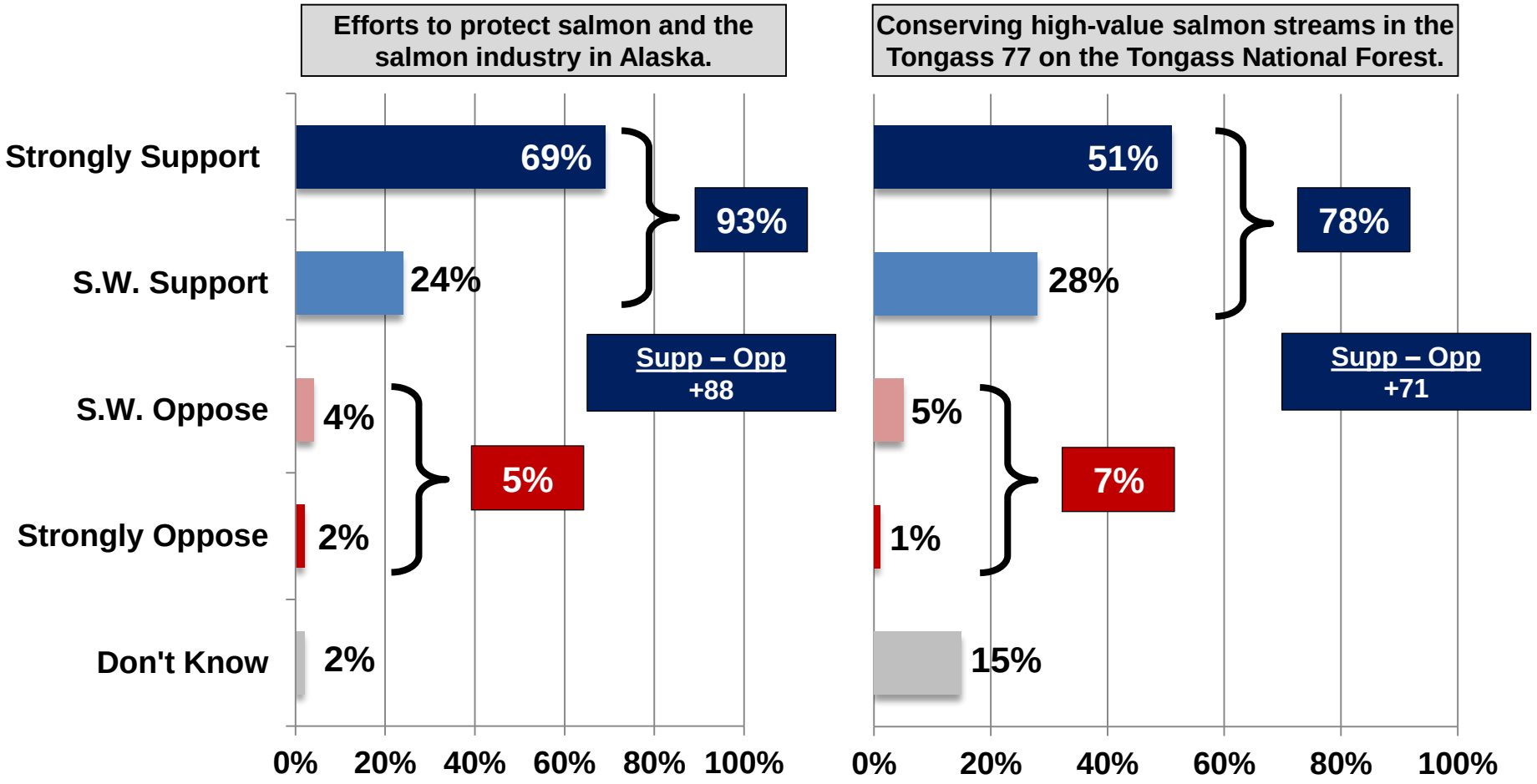
Voters Statewide and in Southeast Alaska Strongly Value the Tongass National Forest

Please indicate if you have a generally favorable or generally unfavorable opinion of each of the following. If you've never heard of that person or group, please indicate so: ***The Tongass National Forest***



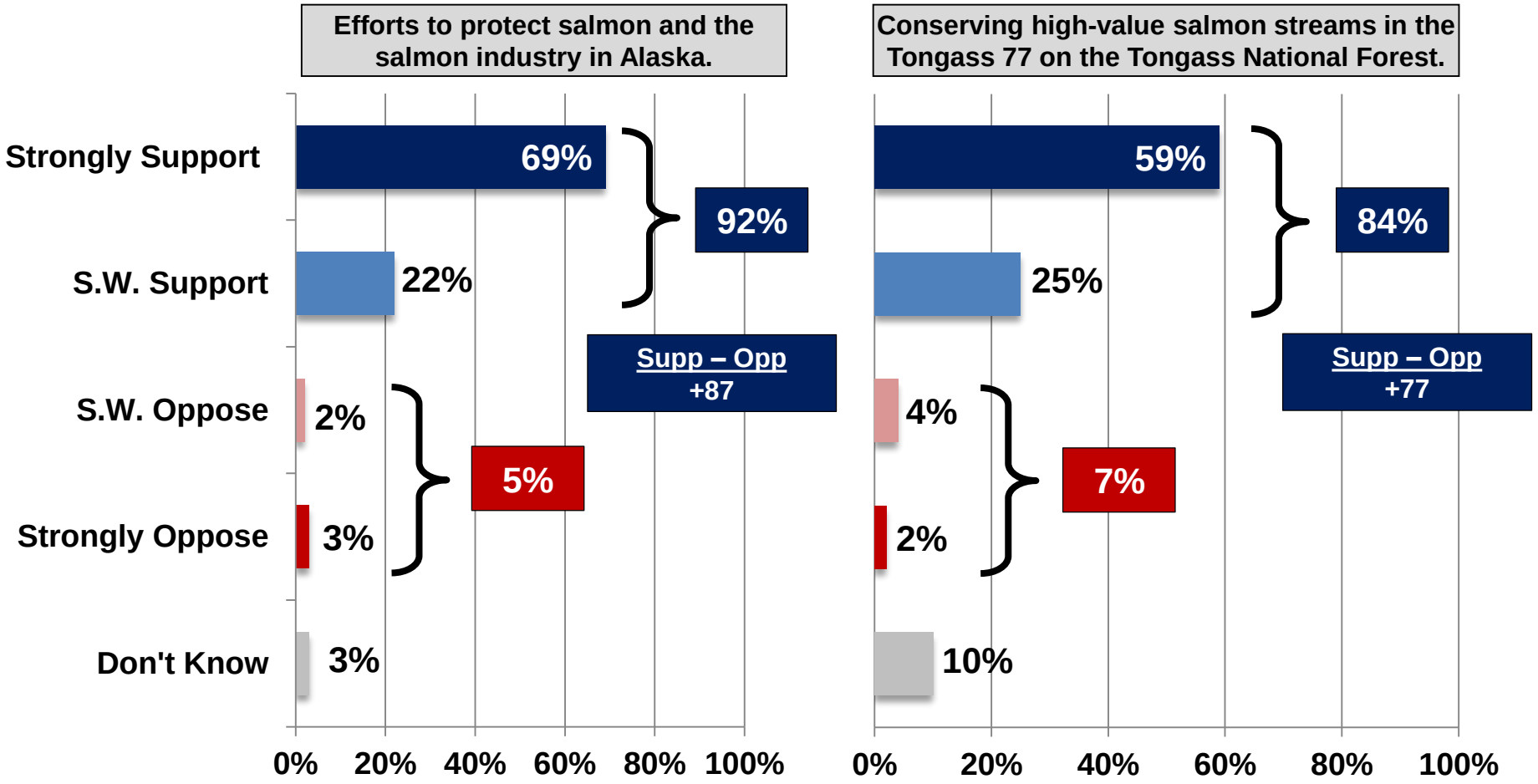
Statewide: Alaskans Strongly Support Salmon Conservation Generally and in the Tongass 77

Here is a list of issues in Alaska. Please indicated whether you strongly support, somewhat support, somewhat oppose or strongly oppose the issue.



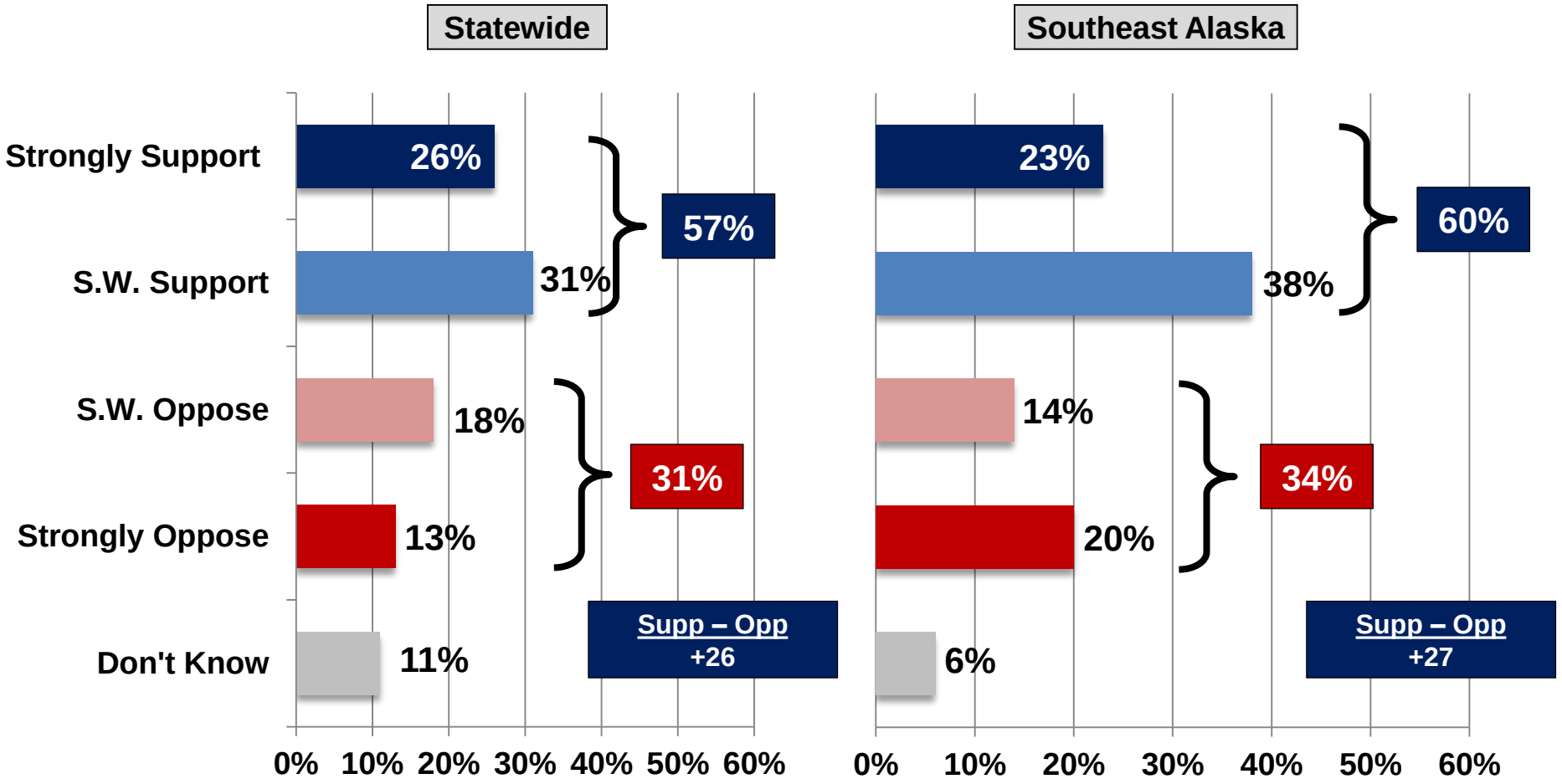
Southeast Alaska: Strong Support for Salmon Conservation

Here is a list of issues in Alaska. Please indicated whether you strongly support, somewhat support, somewhat oppose or strongly oppose the issue.



Alaskans Strongly Support the "Roadless Rule" for the Tongass National Forest

The Roadless Rule conserves undeveloped lands on National Forests by limiting new commercial logging and construction of new logging roads. It allows forest health projects, tree harvest for personal use, transportation highways, and other development activities. Do you strongly support, somewhat support, somewhat oppose or strongly oppose the Roadless Rule for the Tongass National Forest



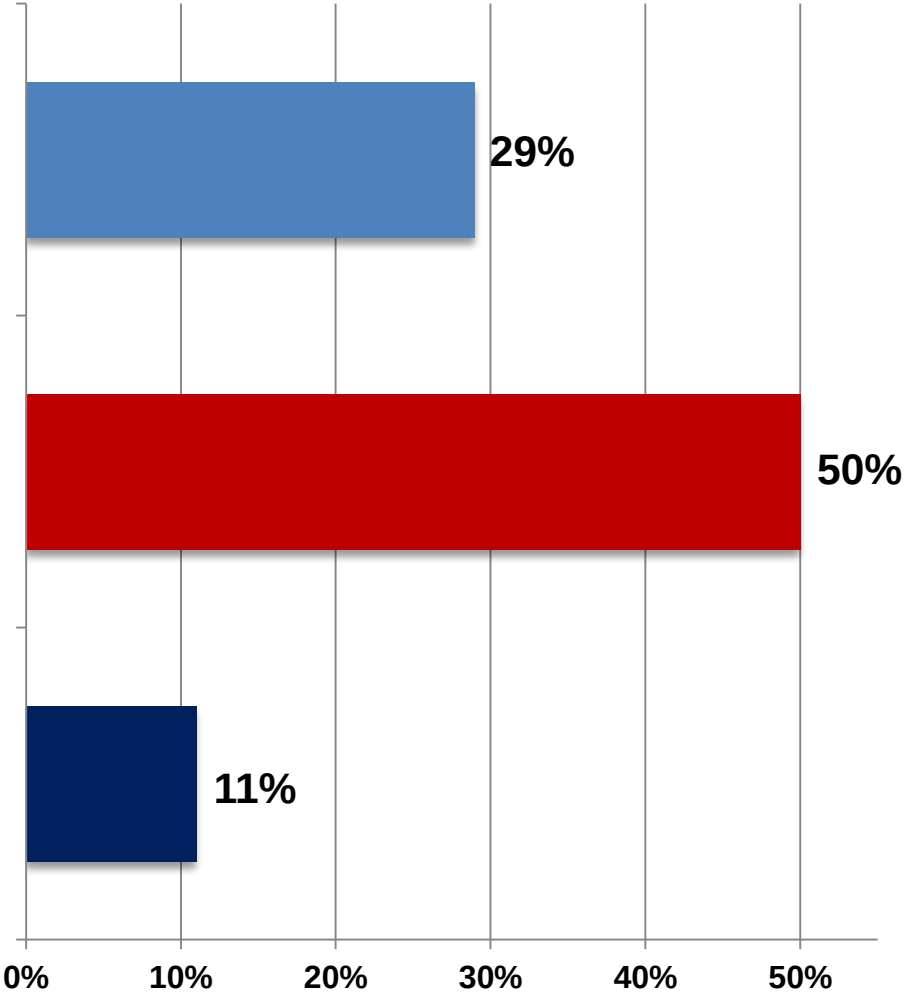
Alaskans Prefer Creating New Protections for Fish and Wildlife if Changes to Roadless Rule

Here are options for the Roadless Rule that the Federal and State government are considering. Please indicate which is closer to your opinion.

Take no action, which means undeveloped portions of the Tongass National Forest will remain protected from commercial logging and logging roads.

Make limited changes to the Roadless Rule that may allow logging and logging roads in places that already have some roads while also creating new protections for important fish and wildlife areas that are now open to logging.

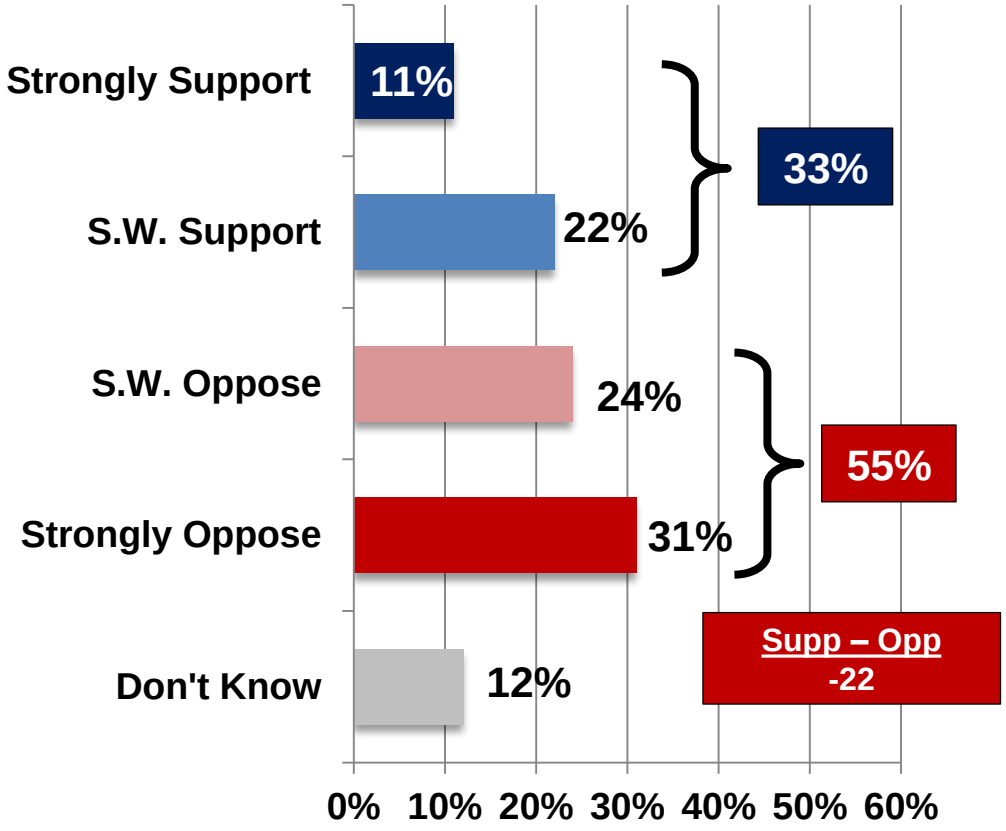
Exempt all of the Tongass National Forest from the Roadless Rule to expand clear cutting of old-growth timber and build new roads in undeveloped portions of the Tongass National Forest.



Alaskans Oppose Clear-Cut Logging of Old-Growth Timber

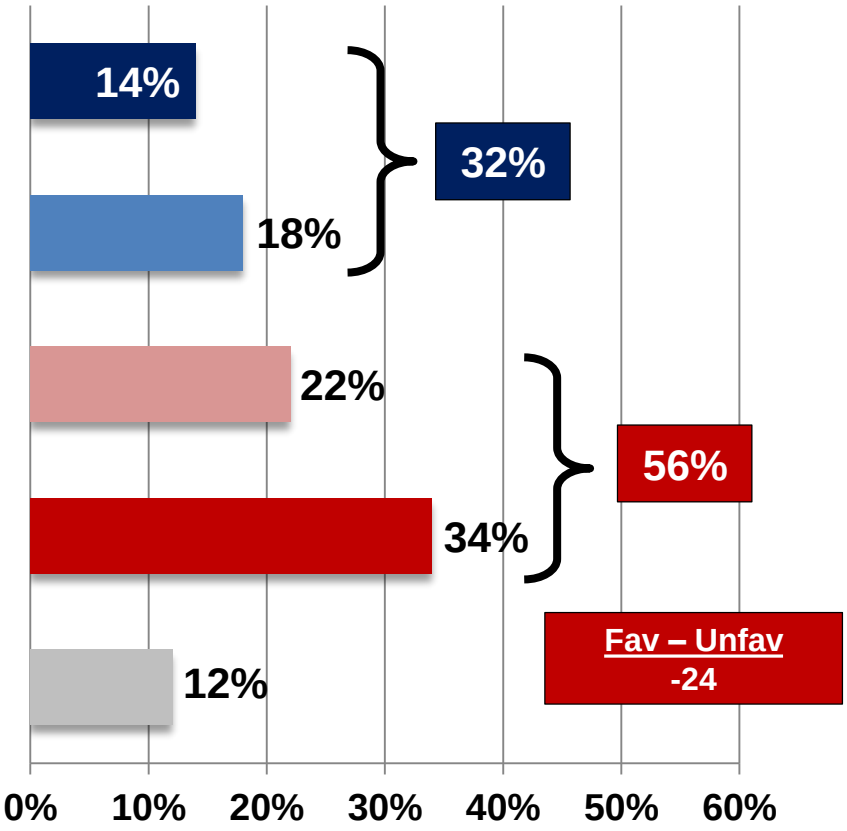
Please indicated whether you strongly support, somewhat support, somewhat oppose or strongly oppose the issue.

Expanding Clear-Cut Logging in Tongass



Please indicate if you have a generally favorable or generally unfavorable opinion of each of the following.

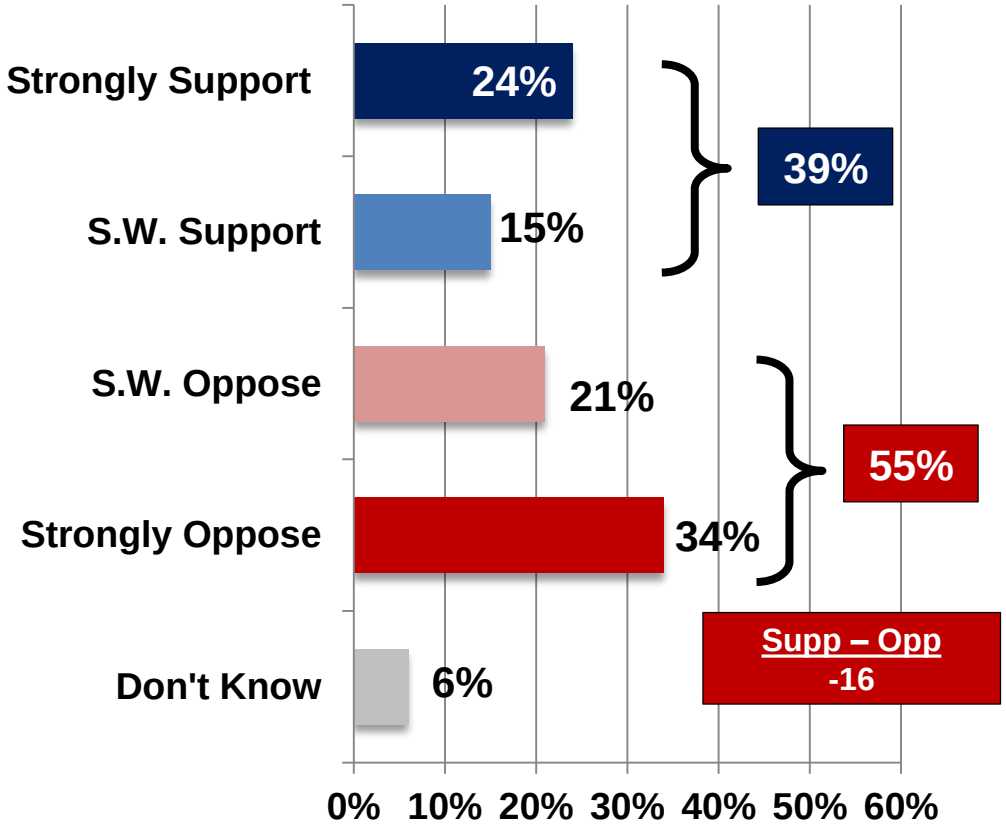
Clear-Cut Logging of Old-Growth Timber



Opposition to Clear-Cut Logging Strong in Southeast Alaska

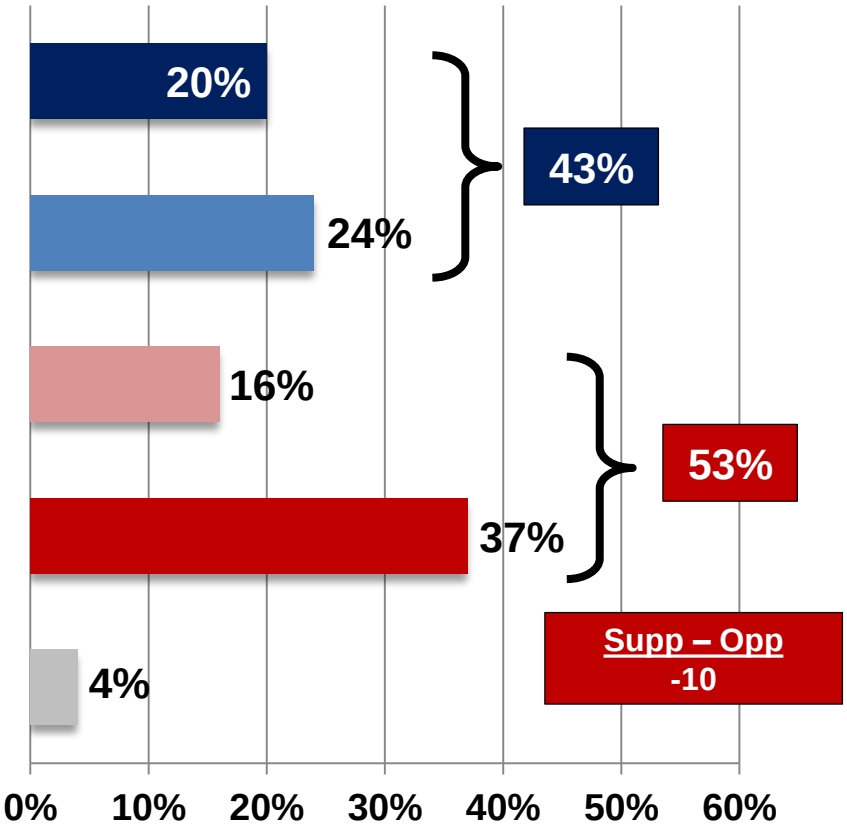
Please indicated whether you strongly support, somewhat support, somewhat oppose or strongly oppose the issue.

Expanding Clear-Cut Logging in Tongass



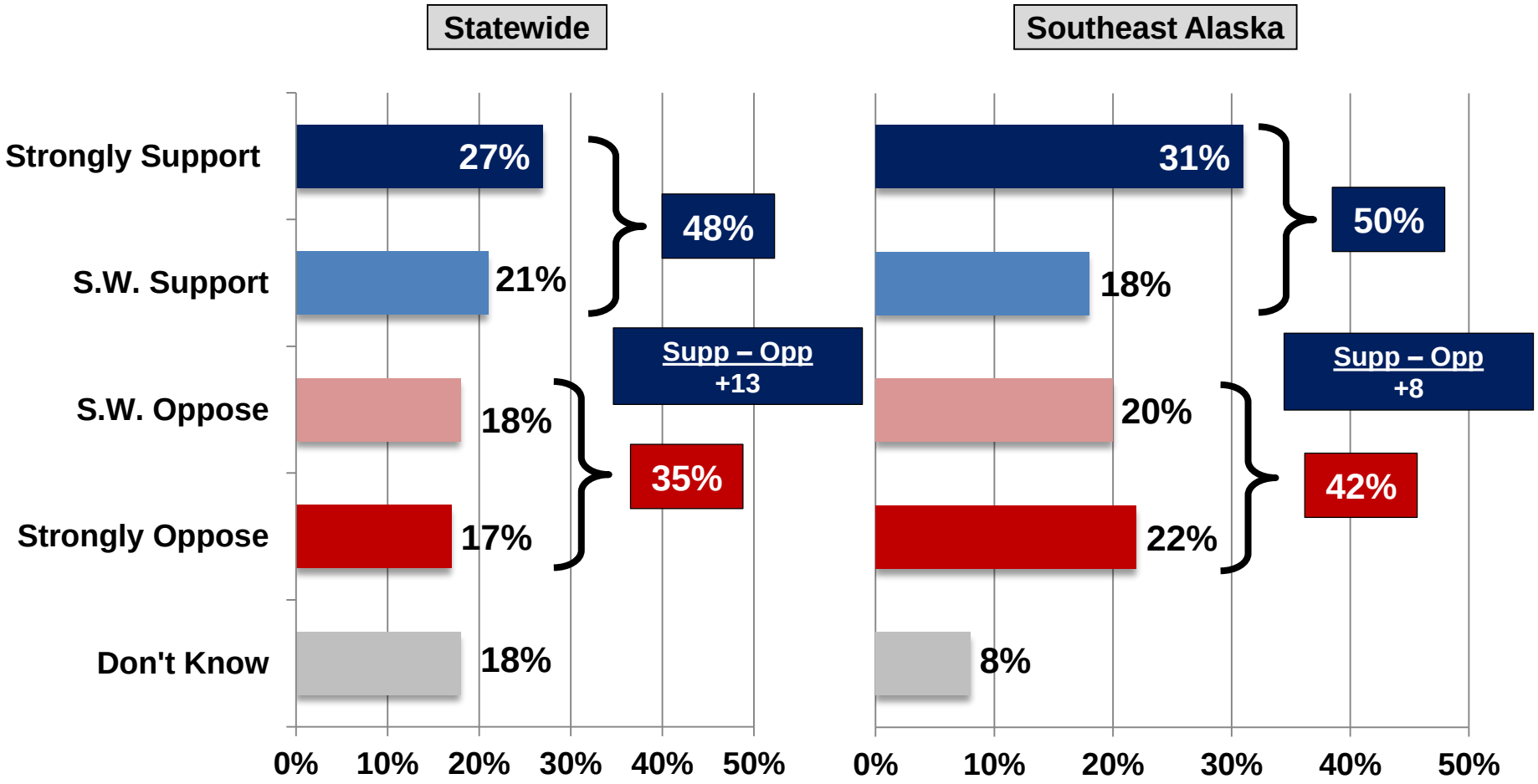
Please indicate if you have a generally favorable or generally unfavorable opinion of each of the following.

Clear-Cut Logging of Old-Growth Timber



Alaskans Favor Ending Clear-Cut Logging in Tongass National Forest

Do you strongly support, somewhat support, somewhat oppose or strongly oppose ending clear-cut logging of old-growth timber in the Tongass National Forest?



For More Information, Contact:

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UNITED STATES DISTRICT COURT

DISTRICT OF ALASKA

ORGANIZED VILLAGE OF KAKE, *et al.*,	)	
Plaintiffs,	)	**1:09-cv-00023 JWS**
vs.	)	
	)	**JUDGMENT IN A CIVIL CASE**
UNITED STATES DEPARTMENT OF AGRICULTURE, et al.,	)	
Defendants,	)	
and	)	
STATE OF ALASKA and ALASKA FOREST ASSOCIATION,	)	
Intervenor-Defendants	)	

By order dated March 4, 2011,[1] the court granted plaintiffs' motion for summary judgment[2] insofar as it sought to vacate the Tongass Exemption to the Roadless Area Conservation Rule and reinstate the Roadless Rule's application to the Tongass. The

[1]Doc. 68.

[2]Doc. 42.

court's order at docket 68 denied plaintiffs' motion without prejudice insofar as it sought an order vacating the Scratching Timber Sale ROD II, and portions of the Iyouktug Timber Sales ROD and Kuiu Timber Sale Area ROD in light of the interim directive issued by the Secretary of Agriculture on May 28, 2010, reserving all decision making on timber sales to the Secretary.

In accordance with the court's decision at docket 68, it is hereby **ORDERED**, **DECLARED**, and **ADJUDGED** that federal defendants' decision to adopt the Tongass Exemption, 68 Fed. Reg. 75,136, 75,146 (Dec. 30, 2003) is **VACATED**, and the Roadless Area Conservation Rule, 66 Fed. Reg. 3244, 3272-73 (Jan. 12, 2001), is **REINSTATED** as to the Tongass National Forest.

Nothing in this judgment shall be construed to prohibit otherwise lawful road construction, road reconstruction, or cutting or removal of timber if and when approved by the U.S. Forest Service to effectuate the following projects:

(1) The Whitman Lake Hydroelectric Project, as licensed by the Federal Energy Regulatory Commission on March 17, 2009;

(2) The Kake-Petersburg Intertie, as described in the Notice of Intent to prepare an Environmental Impact Statement published in the Federal Register on May 7, 2010;

(3) Rainforest Aerial Tram, as described in the Decision Notice and Finding of No Significant Impact issued by the U.S. Forest Service on December 14, 2010;

(4) Greens Creek Exploratory Drilling, as described in the Decision Memo "2011 Surface Exploration Annual Work Plan" issued by the U.S. Forest Service on April 8, 2011;

(5) Greens Creek Geotechnical, as described in the Decision Memo "Geotechnical and Hydrologic Drilling Investigations" issued by the U.S. Forest Service on April 8, 2011;

(6) Greens Creek Tailings Expansion, as described in the Notice of Intent to prepare an Environmental Impact Statement for the project published in the Federal Register on October 5, 2010;

(7) Cascade Point Road/Glacier Highway Extension, as described in the U.S. Forest Service Record of Decision issued on December 22, 1998;

(8) Blue Lake Hydroelectric Expansion, as described in the Federal Energy Regulatory Commission Notice of Application Accepted for Filing, Project No. 2230-044, April 8, 2011;

(9) Little Port Walter hydropower project, as described in the application dated April 2, 2008, from the National Marine Fisheries Service to the U.S. Forest Service for a special use authorization;

(10) Swan Tyee Intertie, as described in the U.S. Forest Service Record of Decision issued in August 1997 and the Secretary of Agriculture's August 11, 2010, redelegation memorandum;

(11) Bokan Mountain Exploration Plan, as described in the proposed Plan of Operations dated March 15, 2011, submitted by Rare Earth One, LLC, to the U.S. Forest Service; and

(12) Niblack Mine Exploratory Drilling, as described in the Decision Memorandum issued by the U.S. Forest Service on September 25, 2009.

Nothing in this judgment shall be construed to prohibit otherwise lawful cutting or removal of timber authorized by the U.S. Forest Service in Inventoried Roadless Areas as follows:

(1) Timber for personal use but not for sale, pursuant to 36 C.F.R. § 223.10 (2010);

(2) Dead and/or down wood for sale as firewood, from within 400 yards of roads now existing and constructed consistent with the Roadless Area Conservation Rule, including roads described in 36 C.F.R. §§ 294.13(b)(4) and 294.14(d) (2001), 66 Fed. Reg. at 3273; and

(3) Dead and/or down wood in microsales of no more than 50,000 board feet, from within 400 yards of roads now existing and constructed consistent with the Roadless Area Conservation Rule, including roads described in 36 C.F.R. §§ 294.13(b)(4) and 294.14(d) (2001), 66 Fed. Reg. at 3273.

Nothing in this judgment shall be construed to prohibit any person or entity from seeking, or the U.S. Department of Agriculture from approving, otherwise lawful road construction, road reconstruction, or the cutting or removal of timber for hydroelectric development pursuant to the standards and procedures set forth in the Federal Power Act, 16 U.S.C. §§ 791-823d. Such developments include, but are not limited to:

(1) Takatz Lake Hydroelectric Project, Federal Energy Regulatory Commission No. P-13234;

(2) Schubee Lake Hydroelectric Project, Federal Energy Regulatory Commission Preliminary Permit No. P-13645;

(3) Lake Shelokum Hydroelectric Project, Federal Energy Regulatory Commission Preliminary Permit No. P-13281;

(4) Soule River Hydroelectric Project, Federal Energy Regulatory Commission Nos. P-12615 and P-13528;

(5) Port Frederick Tidal, Federal Energy Regulatory Commission Preliminary Permit No. P-13512; and

(6) Cascade Creek Hydroelectric Project, Federal Energy Regulatory Commission No. P-12495.

The list of projects and activities herein is not a judgment that they, or any other projects or activities in the Tongass National Forest, would otherwise violate the terms of the Roadless Area Conservation Rule. Nothing herein shall be construed as a judgment about whether projects and activities not listed herein do or do not violate the Roadless Area Conservation Rule.

Pursuant to the interim directive issued on May 28, 2010, by the Secretary of Agriculture reserving all decision making on timber sales to the Secretary, nothing herein shall be construed as a judgment as to the Scratching Timber Sale ROD II, and portions of the Iyouktug Timber Sales ROD and Kuiu Timber Sale Area ROD.

DATED this 24th day of May 2011.

/s/ JOHN W. SEDWICK
UNITED STATES DISTRICT JUDGE

United States Department of Agriculture Forest Service

Frequently Asked Questions Regarding Inventoried Roadless Areas

U.S. Forest Service Alaska Region
January 2018

Please Note: The Ninth Circuit Court of Appeals recently upheld the United States District Court for District of Alaska's 2011 reinstatement of the Roadless Rule on the Tongass National Forest. Consequently, the Roadless Rule remains in effect in Alaska and the Forest Service continues to apply the Rule to the Tongass and Chugach National Forests. In September 2017, the D.C. District Court issued a favorable ruling in a second case involving the Roadless Rule, which the State of Alaska appealed in November 2017. The Forest Service will comply with all court orders.

Purpose

This document answers commonly asked questions about how the Roadless Area Conservation Rule (Roadless Rule) applies to National Forest System (NFS) lands in Alaska. Since its adoption in 2001, the Roadless Rule has been the subject of litigation concerning how it is to be applied to the Tongass and Chugach National Forests. Stakeholders with an interest in these lands, such as utility companies, timber and mining interests, and local communities, have raised questions about how the Roadless Rule will affect permits, contracts and other special uses involving access, road construction and road maintenance in inventoried roadless areas within Alaska's National Forests. This document responds to these queries within the context of currently applicable law, which holds that the Roadless Rule applies to NFS lands in Alaska.

Background

The Roadless Rule was adopted in January 2001 to protect the social and ecological values and characteristics of inventoried roadless areas from road construction and reconstruction and certain timber harvest activities. Inventoried roadless areas provide large, relatively undisturbed blocks of important habitat for a variety of terrestrial and aquatic wildlife and plants; contribute to healthy watersheds and clean drinking water; and provide extensive opportunities for outdoor recreation and tourism. Protection of these roadless areas on both the Tongass and Chugach National Forests is of local and national importance.

The State of Alaska in 2001 filed a complaint in the United States District Court, District of Alaska, challenging the application of the Roadless Rule to the Chugach and Tongass National Forests. The Forest Service and the State of Alaska reached a settlement in 2003, and the Forest Service subsequently issued a rule temporarily exempting the Tongass National Forest from the Roadless Rule. In 2011, the District Court set aside the 2003 Tongass Exemption and reinstated the 2001 Roadless Rule with respect to the Tongass. A March 2014 ruling by the Ninth Circuit Court of Appeals reversed that decision. The Ninth Circuit subsequently granted a petition for rehearing en banc, held in December 2014 before an eleven judge panel. On July 29, 2015, a six judge majority of the en banc panel held that USDA's justification for the Tongass Exemption was inadequate under the Administrative Procedure Act, holding it did not provide a reasoned explanation for contradicting the findings in the 2001 Record of Decision for the Roadless Rule. The majority upheld the District Court's reinstatement of the Roadless Rule. Consequently, the Roadless Rule remains in effect in Alaska and the Forest Service continues to apply the Rule to the Tongass and Chugach National Forests.

In another court case, the State of Alaska has challenged the Roadless Rule in the U.S. District Court for the District of Columbia. On September 20, 2017, the D.C. District Court dismissed the State's challenge to the Roadless Rule, finding that the State had failed to show violation of any federal statute in the USDA's promulgation of the Roadless Rule. The State of Alaska appealed the district court's decision on November 28, 2017, and the case remains pending before the U.S. Circuit Court of Appeals for the District of Columbia.

Inventoried roadless areas in the Alaska Region include 9.5 million acres (57 percent) of the Tongass National Forest and 5.4 million acres (99 percent) of the Chugach National Forest. The majority of the Tongass inventoried roadless areas (7.4 million acres) are allocated to non-development land use designations in the current forest plan. Including all other non-development land use designations, a total of 13.3 million acres (80 percent of the Tongass) is generally off-limits to road construction and timber harvest activities.

Q1. Where can I find a copy of the Roadless Rule?

A copy of the Roadless Rule can be found online at http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5050459.pdf

Q2. Does the Roadless Rule apply to National Forests in Alaska?

Yes, the Roadless Rule applies to the Chugach National Forest as well as to the Tongass National Forest pursuant to the ruling of the U.S. District Court for the District of Alaska in *Organized Village of Kake v. USDA,* No. 1:09-cv-00023 (March 4, 2011) (upheld on appeal). The district court's final judgment, *Organized Village of Kake v. USDA*, No. 1:09-cv-00023 (May 24, 2011), makes special provision for certain projects and activities, including:

- road construction and timber cutting for listed projects;
- personal timber use, firewood, and certain roadside microsales; and
- hydroelectric development.

The Forest Service regards these projects and activities identified in the District Court's May 24, 2011 final judgment as exempt from the prohibitions of the 2001 Roadless Rule under the terms of the final judgment.

Q3. Does the most recent 9th Circuit Court of Appeals Decision mean that the Roadless Rule applies to the Tongass National Forest?

On July 29, 2015, a six judge majority of the en banc panel held that USDA's justification for the Tongass Exemption was inadequate under the Administrative Procedure Act, holding it did not provide a reasoned explanation for contradicting the findings in the 2001 Record of Decision for the Roadless Rule. The majority upheld the Alaska District Court's reinstatement of the Roadless Rule. Consequently, the Roadless Rule remains in effect in Alaska and the Forest Service continues to apply the Rule to the Tongass and Chugach National Forests.

Q4. How do I know if my proposed project is in an inventoried roadless area?

Inventoried roadless areas are shown on the Forest Service Roadless Area Conservation website at http://www.fs.usda.gov/roadmain/roadless/home. The maps for Alaska can be reached by following this link: http://www.fs.usda.gov/detail/roadless/2001roadlessrule/maps/statemaps/?cid=fsm8_037699.

Always ask your local Forest Service Ranger District Office as they will have the most detailed and up-to-date maps.

Q5. Does the Roadless Rule prohibit all road construction in inventoried roadless areas?

The Roadless Rule generally prohibits construction or reconstruction of roads in inventoried roadless areas of the National Forest System, but with some exceptions. The Roadless Rule allows the Forest Service Line Officer to authorize construction or reconstruction of a road in an inventoried roadless area if he or she determines it is needed for one of the following reasons:

- To protect public health and safety;
- To conduct environmental response under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) or to conduct a restoration action under CERCLA, the Clean Water Act, or the Oil Pollution Act;
- To allow for reserved or outstanding rights or as provided for by statute or treaty;
- To prevent irreparable resource damage under certain circumstances;
- To implement a road safety improvement project under certain circumstances;
- When the Secretary of Agriculture has determined that a Federal Aid Highway project is in the public interest or is consistent with the purposes for which the land was reserved or acquired and no other reasonable and prudent alternative exists; or
- When a road is needed in conjunction with mineral leases on lands that were under lease as of January 12, 2001 and were immediately extended upon the expiration of the leases.

For additional information concerning road construction and reconstruction in inventoried roadless areas in the National Forest System, see the Roadless Rule regulations at 36 CFR §294.12.

Q6: Does the Roadless Rule prohibit all timber cutting in inventoried roadless areas?

The Roadless Rule generally prohibits the cutting, selling, or removal of timber in inventoried roadless areas of the National Forest System, but with some exceptions. The Roadless Rule allows the Forest Service Line Officer to authorize these activities in the following circumstances:

- The cutting, sale, or removal of generally small diameter timber is needed for one of the following purposes and will maintain or improve roadless area characteristics;
  - To improve endangered, proposed, or sensitive species habitat; or

  - To maintain or restore the characteristics of the ecosystem.
- The cutting, sale, or removal of timber is incidental to another activity that is not otherwise prohibited;
- The cutting, sale or removal of timber is needed and appropriate for personal or administrative use; or
- The roadless characteristics of the area have already been substantially altered by road construction and timber cutting within certain parameters described in the Roadless Rule.

For additional information concerning timber harvesting in inventoried roadless areas in the National Forest System, see the Roadless Rule regulations at 36 CFR §294.13.

Q7. For activities that are permissible in inventoried roadless areas in Alaska, what process must be followed to authorize road construction or reconstruction or removal of timber?

Initially, applicants should contact the District Ranger to discuss a proposed project to determine what type of permit and review process is appropriate. The Chief of the Forest Service continues to review certain activities planned in inventoried roadless areas to ensure the Forest Service is applying a nationally consistent approach to implementation of the Roadless Rule and that the agency is complying with its mandate to protect roadless area characteristics. The Chief's May 31, 2012 letter outlining the types of projects requiring the Chief's review can be found at http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5373645.pdf.

Generally, the Chief's review will be completed within other, concurrent review processes, such as an environmental review process under the National Environmental Policy Act (NEPA). More detailed information can be found on the National Forest Service Roadless Area Conservation website at http://www.fs.usda.gov/roadmain/roadless/home.

The Chief also identified activities that may be reviewed by Regional Foresters. In general, line officers in the Alaska Region, with appropriate review by the Regional Forester, have the authority to approve timber cutting or removal in certain situations such as:

- emergencies;
- incidental to implementation of an existing special use authorization; or
- cutting, sale, or removal of generally small diameter timber for specified purposes, such as wildlife habitat improvement and administrative and personal use.

Line officers also have the authority to approve free use of timber to Alaskan settlers, miners, residents and prospectors. Such use should occur in inventoried roadless areas only when needs cannot be met in the roaded land base. When personal use timber is collected from inventoried roadless areas, it shall be done in a manner that maximizes the protection of the roadless character and wildlife habitat, recreation and other values associated with inventoried roadless areas.

Q8. What types of activities have been approved to take place in inventoried roadless areas in Alaska?

As of January 2018, 55 projects within roadless areas in Alaska have been submitted for Secretarial or Chief's review and all have been approved. Projects that have been approved include:

- 36 mining projects;
- 10 hydropower or intertie projects;
- a road re-alignment;
- a timber sale;
- a U.S. Coast Guard Differential Global Positioning System Antenna;
- re-delegation of the authority to issue free use permits to include free use of timber to Alaskan settlers, miners, residents and prospectors;
- an aerial tram;
- a special use permit to the Alaska Army National Guard for training activities;
- a geothermal lease;
- a road reconstruction project; and
- the issuance of a road easement to the State of Alaska.

Under the current review process, most projects are approved by the Chief of the Forest Service within a month of submission.

Q9. How does the Roadless Rule apply to mining activities in Alaska?

The 1872 Mining Law gives a statutory right of reasonable and necessary access related to the exploration and development of mineral properties. This statutory right is subject to reasonable regulation for the protection of surface resources. If the inventoried roadless area is open to mineral entry, locatable mineral mining, including certain activities ancillary to the mining, may be approved. Exploration and development of leasable minerals, such as oil and gas or geothermal resources, are not prohibited under the Roadless Rule. A road needed in conjunction with the continuation, extension, or renewal of a mineral lease originally issued prior to January 12, 2001 may be permitted. The Roadless Rule anticipates a number of permissible activities, including certain special uses, that do not involve "road construction or reconstruction" (see response to Q10, below). The Forest Service will work with the project proponent to determine the permissible activities during NEPA analysis of a proposed project.

Q10. How does the Roadless Rule apply to the construction and maintenance of transmission lines in Alaska?

The Roadless Rule does not prohibit construction of power lines or oil and gas transmission lines in inventoried roadless areas. The Roadless Rule anticipates a multitude of permissible activities, including authorized special uses, that do not involve "road construction or reconstruction" as defined in 36 CFR §294.2 (66 Fed. Reg. 3272).

The Roadless Rule defines the term "road" as "[a] motor vehicle travelway over 50 inches wide, unless designated and managed as a trail" (66 Fed. Reg. 3272). Under the Rule, temporary or permanent roads are not permitted in inventoried roadless areas, except as otherwise noted. In contrast, a necessary "linear construction zone" may be temporarily authorized where anticipated activities do not include road construction or reconstruction. See Wilderness Workshop v. US BLM, 531 F.3d 1220 (10th Cir. 2008). The Forest Service will work with project applicants to determine responsibilities and obligations concerning such special use applications.

Q11. What process must be followed to approve hydroelectric development in an inventoried roadless area?

The Federal Power Act (FPA) grants the Federal Energy Regulatory Commission (FERC) the authority to issue and administer licenses for hydropower projects. For projects located on National Forest System lands, section 4(e) of the FPA requires FERC to determine whether the project is consistent with the purposes of the forest reservation. Section 4(e) also gives the Forest Service authority to impose mandatory conditions in the FERC license to ensure the adequate protection and utilization of a forest reservation.

To learn more about how to apply for a FERC hydropower license, go to: www.ferc.gov/industries/hydropower/gen-info/licensing.

When an applicant applies to FERC for a preliminary permit in an inventoried roadless area, they should meet with the Forest Service district to discuss the special use permit needed to conduct the work to be carried out under the preliminary permit. When an applicant applies to FERC for a license, the Forest Service will work with the applicant and FERC to coordinate terms and conditions necessary to ensure the adequate protection and utilization of the forest reservation. The Forest Service transmits the terms and conditions to be included in the license to FERC, in accordance with section 4(e) of the FPA.

The Alaska District Court's judgment in *Organized Village of Kake, et al., v. USDA, et al.* states:

> Nothing in this judgment shall be construed to prohibit any person or entity from seeking, or the USDA from approving, otherwise lawful road construction, road reconstruction, or the cutting or removal of timber for hydroelectric development pursuant to the standards and procedures set forth in the Federal Power Act.

Q12: Will the Tongass Forest Plan amendment address hydropower development?

The Forest Service proposes to amend the Tongass Forest Plan. Among other things, the amendment will address whether changes are needed to provide for the development of hydropower.

For more information contact your local Forest Service Office:

Chugach National Forest:

Chugach National Forest Supervisor's Office
161 East 1st Avenue, Door 8
Anchorage, AK 99501
(907) 743-9500

Cordova Ranger District
P.O. Box 280
Cordova, AK 99574-0280
(907) 424-7661

Glacier Ranger District
P.O. Box 129
145 Forest Station Road
Girdwood, AK 99587-0129
(907) 783-3242

Seward Ranger District
P.O. Box 390
334 Fourth Avenue
Seward, AK 99664-3374
(907) 224-3374

Tongass National Forest:

Tongass National Forest
648 Mission Street
Federal Building
Ketchikan, AK 99901-6591
(907) 225-3101

Petersburg Supervisor's Office
123 Scow Bay Loop Road
P.O. Box 309
Petersburg, AK 99833-0309

Sitka Supervisor's Office
204 Siginaka Way
Sitka, AK 99835-7316
(907) 747-6671

Craig Ranger District
P.O. Box 705
900 Main Street
Craig, AK 99921-9998
(907) 826-3271

Hoonah Ranger District
P.O. Box 135
430 Airport Way
Hoonah, AK 99829-0135
(907) 945-3631

Juneau Ranger District
8510 Mendenhall Loop Road
Juneau, AK 99801
(907) 586-8800

Ketchikan-Misty Fiords Ranger District
3031 Tongass Avenue
Ketchikan, AK 99901-5743
(907) 225-2148

Petersburg Ranger District
P.O. Box 1328, 12 North Nordic Drive
Petersburg, AK 99833-1328
(907) 772-3871

Sitka Ranger District
204 Siginaka Way
Sitka, AK 99835
(907) 747-6671

Thorne Bay Ranger District
P.O. Box 19001
1312 Federal Way
Thorne Bay, AK 99919-0001
(907) 828-3304

Wrangell Ranger District
P.O. Box 51
525 Bennett Street
Wrangell, AK 99929-0051
(907) 874-2323

Yakutat Ranger District
P.O. Box 327
712 Ocean Cape Road
Yakutat, AK 99689-0327
(907) 784-3359

Trump pushes to allow new logging in Alaska's Tongass National Forest

Juliet Eilperin

President Trump has instructed Agriculture Secretary Sonny Perdue to exempt Alaska's 16.7-million-acre Tongass National Forest from logging restrictions imposed nearly 20 years ago, according to three people briefed on the issue, after privately discussing the matter with the state's governor aboard Air Force One.

The move would affect more than half of the world's largest intact temperate rainforest, opening it to potential logging, energy and mining projects. It would undercut a sweeping Clinton administration policy known as the "roadless rule," which has survived a decades-long legal assault.

Trump has taken a personal interest in "forest management," a term he told a group of lawmakers last year he has "redefined" since taking office.

Politicians have tussled for years over the fate of the Tongass, a massive stretch of southeastern Alaska replete with old-growth spruce, hemlock and cedar, rivers running with salmon, and dramatic fjords. President Bill Clinton put more than half of it off limits to logging just days before leaving office in 2001, when he barred the construction of roads in 58.5 million acres of undeveloped national forest across the country. President George W. Bush sought to reverse that policy, holding a handful of timber sales in the Tongass before a federal judge reinstated the Clinton rule.

environment. (Reuters)

Trump's decision to weigh in, at a time when Forest Service officials had planned much more modest changes to managing the agency's single largest holding, revives a battle that the previous administration had aimed to settle.

In 2016, the agency finalized a plan to phase out old-growth logging in the Tongass within a decade. Congress has designated more than 5.7 million acres of the forest as wilderness, which must remain undeveloped under any circumstances. If Trump's plan succeeds, it could affect 9.5 million acres.

Timber provides a small fraction of southeastern Alaska's jobs — just under 1 percent, according to the regional development organization Southeast Conference, compared with seafood processing's 8 percent and tourism's 17 percent.

But Alaskans, including Gov. Mike Dunleavy (R) and Sen. Lisa Murkowski (R), have pressed Trump to exempt their state from the rule, which does not allow roads except when the Forest Service approves specific projects. It bars commercial logging.

In a statement, Murkowski said Alaska's entire congressional delegation and the governor have sought to block the roadless rule.

"It should never have been applied to our state, and it is harming our ability to develop a sustainable, year-round economy for the Southeast region, where less than one percent of the land is privately held," she said. "The timber industry has declined precipitously, and it is astonishing that the few remaining mills in our nation's largest national forest have to constantly worry about running out of supply."

Alaskan leaders have found a powerful ally in the president. Speaking to reporters on June 26, after meeting with Trump during a refueling stop at Elmendorf Air Force Base, Dunleavy said of the president, "He really believes in the opportunities here in Alaska, and he's done everything he can to work with us on our mining concerns, timber concerns; we talked about tariffs as well. We're working on a whole bunch of things together, but the president does care very much about the state of Alaska."

Trump expressed support for exempting the Tongass from the roadless rule during that conversation with Dunleavy, according to three people who spoke on the condition of anonymity to discuss internal deliberations. Earlier this month, Trump told Perdue to issue a plan to that effect this fall, these individuals said.

It is unclear how much logging would take place in the Tongass if federal restrictions were lifted because the Forest Service would have to amend its management plan to hold a new timber sale. The 2016 plan identified 962,000 acres as suitable for commercial timber and suggested no more than 568,000 acres of that should be logged.

John Schoen, a retired wildlife ecologist who worked in the Tongass for the Alaska Department of Fish and Game, co-authored a 2013 research paper finding that roughly half of the forest's large old-growth trees had been logged last century. The remaining big trees provide critical habitat for brown bears, Sitka black-tailed deer, a bird of prey called the Northern Goshawk and other species, he added.

Trump has frequently talked with his advisers about how to manage the nation's forests and signed an executive order last year aimed at increasing logging by

streamlining federal environmental reviews of these projects. The president was widely ridiculed after suggesting during a visit to Paradise, the California community devastated by a 2018 wildfire, that the United States could curb such disasters by following Finland's model, claiming that nation spends "a lot of time on raking and cleaning and doing things, and they don't have any problem."

The president has peppered Perdue with questions about forest management and has indicated that he wants to weigh in on any major forestry decision, according to current and former aides. Trump wanted to deprive California of federal funds in retaliation for the way officials managed the state's forests, but he did not follow up on the plan.

One former Trump staffer, who spoke on the condition of anonymity to avoid retaliation, said forest policy has become "an obsession of his."

White House and Agriculture Department officials referred questions this week to the Forest Service, which declined to comment. But the three people who spoke on the condition of anonymity said it was forging ahead with an exemption at Perdue's instructions.

Chris Wood, president of the environmental group Trout Unlimited, joined with local business owners and conservation and outdoors organizations in urging federal officials to make more limited changes to the rule. He said the shift could jeopardize the region's commercial, sport and subsistence salmon fishing industry.

About 40 percent of wild salmon that make their way down the West Coast spawn in the Tongass: The Forest Service estimates that the salmon industry generates $986 million annually. Returning salmon bring nutrients that sustain forest growth, while intact stands of trees keep streams cool and trap sediment.

Wood, who worked on the Clinton rule while at the Forest Service, said that in recent years, agency officials have "realized the golden goose is the salmon, not the trees."

"They need to keep the trees standing in order to keep the fish in the creeks," Wood said.

The question of what sort of roads should be built in the United States' remaining wild forests sparked intense battles in the 1990s, culminating in the 2001 rule affecting a third of the Forest Service's holdings in a dozen states. Some Western governors, including in Idaho and Wyoming, challenged the restrictions.

In some cases, conservationists and developers have forged compromises. A decade ago, Idaho officials opened up roughly 400,000 acres of roadless areas to ease operations for a phosphate mine while protecting 8.9 million acres in exchange.

But in Alaska, consensus has been more elusive, with many state officials arguing that the limits have hampered development.

The Forest Service has approved at least 55 projects in roadless areas, according to the agency, including 36 for mining and 10 related to the power sector. Most win approval "within a month of submission," according to an agency fact sheet.

But Robert Venables, executive director of the Southeast Conference, said permitting for some projects has taken years and made them too costly to complete. A proposal

that would have lowered electricity costs in the Alaskan community of Kake by connecting its supply to neighboring Petersburg, he said, won approval only after a lengthy review, which imposed requirements that boosted the price tag into the tens of millions.

"The roadless rule has shown itself to be very arbitrary and cumbersome," Venables said in a phone interview. "Many projects have proven to be uneconomic because of the constraints here."

A number of businesses operating in the region back the current restrictions, arguing that the forest's rugged landscapes, abundant wildlife and pristine terrain draw visitors.

Dan Blanchard, owner and CEO of the adventure travel firm UnCruise Adventures , said in an interview that when he was working as a boat captain in the 1980s, "we had a difficult time avoiding clear cuts in southeast Alaska."

"The forest has come back," said Blanchard, who has 350 employees and brings 7,000 guests to Alaska each year. "The demand for wilderness and uncut areas have just dramatically increased. Our view here is, there are very few places in the world that are wild. Here we have one, in southeast Alaska, and it's being put at risk."

Tongass Advisory Committee Final Recommendations

December 2015

Acknowledgements

The TAC received guidance and support from:

Jason Anderson – Designated Federal Official and Deputy Forest Supervisor, Tongass National Forest

Forrest Cole – former Forest Supervisor, Tongass National Forest

Karen Hardigg – former Transition Framework Coordinator, Tongass National Forest

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Cover Photo Credit: Sitka Conservation Society

Executive Summary

The Tongass Advisory Committee (TAC) was federally chartered in the winter of 2014 to advise the Secretary of Agriculture on developing an ecologically, socially, and economically sustainable forest management strategy for the Tongass National Forest. They were specifically tasked with developing recommendations about how to transition within 10 to 15 years from old growth to predominantly young growth timber management in a way that is economically viable for the existing industry, while recognizing and balancing the other unique and equally important resource values of the Tongass.

The TAC was comprised of fifteen members from the timber industry, conservation community, Native interests, government, and "other" interests. The TAC members were selected because of their deep knowledge and their willingness to work collaboratively on new approaches, practices, and responses to historically contentious management challenges. They did so with diligence, respect, and honesty during nine meetings between August 2014 and December 2015. (All meeting materials, summaries, and background documents are available on the Committee website: www.merid.org/tongassadvisorycommittee.) Early in the process, they all agreed on a common vision:

"Southeast Alaska is comprised of prosperous, resilient communities that have the opportunity to predictably use and benefit from the diversity of forest resources to achieve the cultural, social, economic, and ecological health of the region for current and future generations."

With that vision in mind, and through extensive modeling of young growth availability, literature review, and consideration of public comments, the TAC achieved consensus on a comprehensive package of recommendations for analysis purposes. Following release of the Draft Environmental Impact Statement and proposed Forest Plan, the TAC reviewed the analysis finalized its recommendations with very few substantive changes. Their work offers the possibility of a regionally focused, collaborative path toward an innovative opportunity for a viable young growth timber industry while honoring the suite of economic, ecological, social, and cultural values inherent in the Forest.

Forest Plan Amendment Recommendations

The TAC's analysis revealed that the current Forest Plan would most likely not achieve the transition to young growth within the 10-15 year timeframe set out in their Charter. Recognizing that a different approach is required, the TAC recommended employing a "co-intent" mandate in the Forest Plan Amendment to improve habitat conditions and long–term ecological function in young growth stands while producing timber volume from those areas. This will enable the Forest to move out of old growth as quickly as possible and accelerate the transition while sustaining an economically viable timber industry.

To implement the co-intent approach, the TAC recommends that the Forest Service:

a) **Maximize the use of flexibilities designed to replace old growth harvest with young growth harvest on a one-to-one volumetric basis**. For the purposes of the recommended flexibilities in young growth management, the overall transition period is defined by the TAC as a period not to exceed 15 years from the date of the Amendment's Record of Decision (ROD). The TAC is making these recommendations to apply to young growth timber only and would not apply them to old growth timber.
b) **Provide more flexibility and opportunities in the existing timber management areas for young growth.**
c) **Use specific treatments for young growth harvest in areas that are not currently designated as "suitable" for harvest during the transition period, provided the original objective of the particular Land Use Designation (LUD) and/or standards and guidelines (S&Gs) is respected**. The TAC recognized the high ecological value of the non-suitable lands. However, many of those stands of young growth forest do not provide the full ecological function that they would have in the un-harvested state. Habitat treatments that improve ecological conditions will benefit wildlife and game populations while also improving the ecological functioning of the larger landscape, and will increase the understanding of effective habitat restoration treatments and allow operators to become more effective at habitat restoration activities.
d) **Aggressively monitor the outcomes of management activities resulting from the transition and apply adaptive management to improve outcomes**. Review the recommended flexibilities made by the TAC for all LUDs and S&Gs at least every five years. At the conclusion of the transition, a full review process should be conducted to evaluate continuity in whole, part, or expanded form.
e) **Fully utilize currently allowed prescriptions in beach buffer, Old Growth Reserves, and Riparian Management Areas (outside of Tongass Timber Reform Act buffers) that improve fish and wildlife habitat and create a commercial byproduct.** Further, the TAC believes that young growth volume produced from these treatments should be counted towards the Potential Timber Sale Quantity.
f) **Identify where young growth timber projects, during the period of the transition, intersect with certain high-value fish watersheds.** In these areas of intersection, conduct a timely scientific review to determine likely impacts to fish and wildlife habitat from timber harvest. If harvest is proposed in one of these watersheds, the Forest Service may apply additional standards or guidelines to mitigate risk to fish habitat.
g) **Maintain the existing suitable land base for young growth timber (i.e., no net loss of young growth acres).** If suitable young growth acres are removed from the timber base as a result of review, an equal number of acres should be added to the young growth timber base.
h) **Engage stakeholders, such as conservation interests, timber operations, permitted user groups, and other interested parties in multi-party planning using an integrated resource management planning framework** to: best design and

implement projects to meet ecological, social, and economic goals; provide best practices for producing timber volume from treatments; and develop management prescriptions and identify areas where co-intent prescriptions are best applied. Monitor the response of the timber industry and assist in their transition by investing in infrastructure and market development.

i) **Overhaul administrative practices for timber sales to improve timeliness, lower costs, and strengthen supply consistency** required in an industry dependent on predominantly young growth.

Old Growth Bridge Strategy

By bringing more young growth forward sooner in the transition period, the Forest can reduce old growth harvest earlier. For every unit of young growth volume brought forward into the transition solution, there should be an equal unit less of old growth. Ultimately this will result in transitioning from old growth to young growth in less than 15 years by making more young growth available for harvest and substituting young growth for old growth on a one-to-one volumetric basis, using the annual timber demand, which will be held constant during the transition period.

To provide a more accurate prediction of available young growth during the transition, the TAC recommends a thorough analysis of young growth inventory at the stand level in the first three years of the transition. Based on this information, the Forest should plan and produce sufficient young growth volume to ensure the required volume through the transition that meets the determined demand. Because the young growth volume is not sufficient to meet demand during the transition period, the Forest should develop a unit pool[1] for bridge timber volume within a specified timeframe to meet the volume demand that cannot be met by young growth during the transition.

Following the transition period, the TAC recommends that the Forest maintain a post-transition annual old growth timber harvest that will meet the long-term demand of small- and micro-sale programs.

Implementing the Transition

The TAC concluded that cultural and operational changes in how the Forest conducts its business are mandatory for the success of the transition. The Forest Service must play a pivotal role in leading, fostering, and supporting the societal and institutional learning the transition will require. Openness, transparency, and collaboration both within the Forest and with external parties will be essential. The TAC's detailed implementation recommendations provide guidance on crucial elements for success and identify critical opportunities by which the TAC,

[1] A unit pool refers to a stand or polygon within a project area, within which landscape objectives could be considered.

Agency, and greater community will share ownership of the transition strategy and embrace its successful implementation.

The recommendations include the following transformative steps:

- Pursue partnerships and collaboration;
- Improve internal Forest Service coordination;
- Support and encourage leadership at the District Ranger level;
- Revamp the sale planning and assessment process;
- Maximize the use of stewardship contracts and agreements; and
- Address incentives and feasibility for operators, and domestic processing and consumption.

In addition, the transition to young growth must provide economically and financially viable opportunities for industry, and meaningful economic and employment benefits to local communities. The TAC provided detailed recommendations for targeted investment, financial assistance, and financing mechanisms for stand inventory, research, infrastructure, and retooling. These investments are intended to help communities and businesses successfully transition to, and thrive within, a new young growth economy.

Monitoring and Research

The TAC's commitment to creating conditions for Tongass communities to thrive is reflected in recommendations for robust and active monitoring and adaptive management:

a) **Convene a Forest-wide collaborative group** as the mechanism by which stakeholders support and help hold themselves and the Forest accountable to the goals of the transition.
b) **Contract an appropriate organization to conduct a baseline socioeconomic benefits analysis** as soon as possible. Key "dashboard" metrics to be included in the analysis are listed in the recommendations report.
c) **Conduct ongoing benefits analyses** at regular intervals for the life of the current plan to demonstrate changes over time in the relationship between planning and implementation of timber and stewardship work and community wellbeing.

In summary, the TAC's recommended actions represent a new paradigm for the Tongass National Forest, and situate the Forest at the leading edge of forest management in the United States. We look forward to the Agency and stakeholders taking on the challenge together of adopting and implementing this paradigm.

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Introduction

Background

The Tongass National Forest (Tongass or Forest) is the largest National Forest in the Nation. The Tongass is comprised of 16.7 million acres and covers the great majority of Southeast Alaska, with the Forest Service (USFS) by far the largest landowner in this part of Alaska. There are 3.4 million acres of Development Land Use Designations (LUDs) allowing commercial timber harvesting, with the remaining 13.3 million acres designated as Wilderness (5.9 million acres) and Natural Setting (7.4 million acres).[2] Only a little over 400,000 acres of timber has actually been harvested to date. This proposal focuses on the 360,000 acres of young growth available to meet the goals of the transition.

There are dozens of communities, including many longstanding Native villages, that exist within the region covered by the Tongass. These communities use and depend on the resources of the Tongass. As a consequence, management decisions and actions of the Tongass National Forest have a great deal of influence on these communities. A multitude of resources and activities produced from the Forest fuel the economies, livelihoods, and way-of-life for the people who live there. The Tongass is also one of the largest temperate rainforests in the world, containing large tracts of intact ecosystems critical to preserving biodiversity and capturing carbon to help mitigate the effects of climate change.

The Tongass is a Native place, home of the Tlingit, Haida, and Tsimshian people, whose cultural identities and traditional way of life are rooted in and tied to the land and waters of Southeast Alaska. Alaska Natives have continuously inhabited the Forest for more than 10,000 years and today are dependent on subsistence hunting and fishing, and utilization of all Tongass resources to sustain their bodies, as well as their traditions, cultures, and livelihoods.

The Forest is a productive landscape that sustains robust fish stocks for subsistence, personal use, and commercial and sport fisheries. Maintaining the habitat diversity and connections among watersheds is essential to the continued productivity of the Forest's salmon fisheries. Land managers are increasingly aware of the economic and social contributions of activities that sustain all these important fisheries.

The Tongass is also home to a vibrant and growing tourism industry. Tourism, from large cruise ships to small and independent tours, plays an important role in the economies of

[2] A chart of acreages is located within the Tongass National Forest 2008 Land and Resource Management Plan, available at: https://fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5367422.pdf.

communities throughout Southeast Alaska. Additionally, the Tongass provides many communities with lake-tap hydropower and presents many opportunities for renewable energy. Then, of course, the Tongass is home to a variety of wildlife and birds; all of which enrich the lives of those who live in and/or visit the Tongass.

The Tongass has a renewable timber resource that is managed on a sustainable basis. During the second half of the 20th century, two fifty-year contracts spurred investments and year round jobs in Southeast Alaska. The region experienced a timber boom with Tongass timber supplying two large regional pulp mills, several large sawmills, and numerous small mills and manufacturing businesses. During that time, several hundred thousand acres were harvested. Many of those stands have continued to be managed for various purposes including future timber production. These stands are now known as young growth and constitute the primary focus of this report for purposes of future harvest.

Contentious debate over Tongass management has overshadowed the opportunities for local solutions. The establishment of the Tongass Advisory Committee (TAC) represents a turning point in Tongass management, seeking new approaches, practices, and responses. The TAC offers a regionally focused, collaborative path toward an innovative opportunity for a viable young growth timber industry, while honoring the suite of values – economic, ecological, social and cultural – inherent in the Forest. (See Appendix A, pg. 31, for a list of TAC members.)

This Plan Amendment is being drafted in a time marked by transition. It is the transition away from predominantly old growth timber harvest to young growth harvest. The Secretary of Agriculture has specifically spelled out the terms of this transition when he set up the Charter for the TAC (see Appendix B, pg. 32). This Charter is narrow in scope and does *not* charge the TAC with making overall recommendations in regard to fisheries, recreation, wildlife management, or tourism. This does not mean these values are overlooked. It does mean that the recommendations of the TAC will be timber-centric in accordance to the Charter issued by Secretary Vilsack. It is important to note that these timber-centric recommendations do not comprise the sole direction of the Tongass National Forest and the TAC encourages the USFS to continue and expand their management and investment in other important sectors of Tongass, such as fisheries, the visitor industry, and renewable energy.

In regards to the management of young growth forest-land, the principles of vegetation management for wildlife, patch cuts and ecological restoration will be relied upon. In regards to the harvest of old growth trees, the principle employed is to replace old growth harvest with young growth harvest within 10-15 years, except for small operators dependent on low-volume, niche markets. The 2016 Plan Amendment should provide the flexibility for USFS staff, partners, and collaborators to succeed in transitioning the Southeast Alaska timber industry from predominantly old growth to young growth. Additionally, the TAC aims to encourage local processing and other economic benefits for local communities and villages.

A critical component for this Plan Amendment to succeed is USFS management embracing the concept of co-intent as outlined in the recommendations of the TAC on page 6.[3] The TAC believes that co-intent creates the space for the USFS to be flexible, adaptive, creative, transparent, and innovative. These traits will be necessary to implement balanced recommendations that foster community well-being, and recognize the priorities of the larger American public.

Purpose

The purpose and need for this Forest Plan Amendment is to respond to the Secretary of Agriculture's July 2nd, 2013 memorandum that directs the USFS to transition timber harvest on the Tongass away from a predominately old growth timber harvest to the utilization of young growth timber resources.[4] This Plan is being amended specifically to accommodate a strategy for the transition that creates opportunities in young growth management and the utilization of forest products in a manner that enhances the economic vitality of the region and the resilience of local communities. The Amendment will evaluate the lands available for young growth timber harvest and provide the guidance for young growth land management activities on the Tongass. This Amendment also considers maximizing the opportunities for social and economic returns from other economic sectors that depend on the Forest.

Vision

Early in the process, the members of the TAC all agreed on a common vision to serve as a touchstone for their deliberations and to help guide the development of the recommendations that follow.

"Southeast Alaska is comprised of prosperous, resilient communities that have the opportunity to predictably use and benefit from the diversity of forest resources to achieve the cultural, social, economic, and ecological health of the region for current and future generations."

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[3] The TAC defines co-intent as: A mandate to maintain the primary intent and objectives of each Land Use Designation and standard and guideline while developing and applying forest management activities that will accelerate the transition to young growth management in the Tongass National Forest.

[4] *Secretary's Memorandum 1044-009: Addressing Sustainable Forestry in Southeast Alaska* is available online through the following link: http://www.merid.org/en/TongassAdvisoryCommittee/~/media/Files/Projects/tongass/August%20meeting/Secretarys%20Directive.pdf.

Recommendations and Action Plan

Rationale

The TAC learned that the current Tongass Land & Resource Management Plan (Forest Plan) would most likely not achieve the transition to young growth within the 10-15 year time frame set out in the Charter as defined by the Secretary of Agriculture. In order to reach the ultimate goal to move out of old growth as quickly as possible and accelerate the transition while sustaining an economically viable timber industry, the TAC recognized that changes in the Forest Plan will be necessary. The TAC discovered that there were opportunities to accelerate the transition to young growth, reduce the commensurate harvest of old growth, and maintain a more reliable timber supply in Southeast Alaska through the transition period. The most effective way to meet these goals is to bring forward and provide advanced age young growth through some time-limited relaxations in standards and guidelines (S&Gs).

The TAC recognizes the high ecological value of the non-suitable lands. However, many of those stands of young growth forest do not provide the full ecological function that they would have in the un-harvested state. Habitat treatments that improve ecological conditions will benefit wildlife and game populations while also improving the ecological functioning of the larger landscape. This work will increase our understanding of effective habitat restoration treatments and will allow operators to become more effective at habitat restoration activities.

Overarching Principles

Throughout the discussion, the TAC returned to several overarching principles that permeated throughout all the recommendations that follow:

1. During the transition, young growth in the suitable land base is not sufficient for a viable timber industry. Therefore, the TAC included recommendations for approaches in non-suitable lands, and suggested changes to S&Gs, for young growth during the transition period.
2. By bringing more young growth forward sooner in the transition period, the USFS can reduce old growth earlier. For every unit of young growth volume brought forward into the transition solution, there should be an equal unit less of old growth.
3. Due to uncertainties in young growth inventory data and often significant differences in on the ground operational outcomes, independent monitoring is essential to achieve the dual objective of reducing old growth sooner and providing for a viable timber industry.
4. Co-intent occurs on all suitable and non-suitable acres, and with proper S&Gs can work to meet multiple uses associated with the Forest.
5. Bringing multi-disciplinary input and stakeholder involvement forward into the project planning process is essential to the success of co-intent.

6. Change in the culture of the USFS is mandatory.
7. The establishment of a forest collaborative is critical to the success of the recommendations.[5] (See Monitoring and Research, pg. 27). Reviews will be conducted at the end of five and ten years to measure the effectiveness of the flexibilities in meeting co-intent goals.
8. In order to maintain a viable young growth timber industry in the future, the existing suitable land base for young growth timber should be maintained (i.e., no net loss of young growth acres). If suitable young growth acres are removed from the timber base as a result of the review process, an equal number of acres should be added to the young growth timber base. Operational and geographic considerations (i.e., close proximity to other young growth acres) should be given priority. The process for this acreage replacement will be determined at the ten year review by a forest collaborative, through consultation at Gate 1, Initial Planning of a Timber Sale Project, and beyond, with a focus on comparable achievement[6].
9. At five and ten year reviews, the USFS, with a forest collaborative and other stakeholders, shall study, identify, and adopt methodology for supply that is tied to future sustained yield from the young growth land base. This new orientation will provide opportunities for the growth and development of an integrated industry focused on community and ecosystem health.

Approach

The TAC approached its work in the following order:

1. Prioritized LUDs and S&Gs where it believed the opportunity to capture more young growth volume in the near-term is the greatest and the risk to the environment would be least.
2. Quantified opportunities and social acceptability of adding additional young growth volume into the transition period, within each LUD and S&G by running several modeling scenarios through Tetra-Tech and Mason, Bruce & Girard (contractors for the Forest Plan Amendment options analysis work).
3. Reviewed and incorporated literature and science related to young growth timber and all public comments provided to the Committee.

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[5] The TAC defines a "forest collaborative" as a balanced, multi-stakeholder group formed and operating to support the USFS in completing a successful transition from old growth to young growth harvest on the Tongass National Forest. Typically, the USFS or other agencies' staff join forest collaboratives as equal members. See Appendix E for a draft memorandum of understanding that provides an example of how the Forest Service might interact with such a forest collaborative.

[6] The current Forest Plan uses the approach of comparable achievement to adjust Old Growth Reserves, provided that alternative reserves provide comparable achievement of the old growth habitat goals and objectives. The Tongass National Forest 2008 Land and Resource Management Plan is available at: https://fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5367422.pdf. See Appendix K of the Forest Plan for additional information.

4. Indexed the social and ecological sensitivity of each LUD and S&G identified in activity 2 above.
5. Defined the concept of co-intent for both suitable and non-suitable lands. Developed goals and potential operating actions within specific and identified LUDs and S&Gs to achieve co-intent, which emphasizes recognizing and balancing the other unique and important resource values on the Forest.
6. Conducted thorough discussions on social acceptance pertaining to the modification of LUDs and S&Gs to fine-tune its Amendment option alternative and prepare a recommendation to include with USFS alternatives for review in draft in later meetings.
7. Emphasized and identified key implementation, investment, monitoring, and research elements required of the USFS in parallel with developing recommended treatment options.

Recommendations for Land Use Designations and Standards and Guidelines

The primary objective of the TAC was to reduce the amount of old growth timber harvest on the Tongass National Forest and accelerate the transition to a young growth based timber program. After evaluating the sensitivity of various LUDs, the TAC recommends the USFS does *not* seek young growth volume or change S&Gs in the following areas:

- Roadless Areas;
- Tongass Timber Reform Act (TTRA) Buffers;
- High vulnerability karst;
- Steep slopes;
- Municipal Watersheds;
- Wild, Scenic, and Recreational Rivers;
- Semi-Remote Recreation;
- Remote Recreation;
- Special Interest Areas;
- Wilderness Areas and National Monuments;
- LUD II; and
- Special Interest Areas.

Further, the TAC recommends the USFS identify where young growth timber projects, during the period of the transition, intersect with certain "high-value fish watersheds" (identified in Appendix C, pg. 37). In these areas of intersection, conduct a timely (during the first five years after the Record of Decision (ROD)) internal scientific review in collaboration with a forest collaborative and other stakeholders to determine likely impacts to fish and wildlife habitat from timber harvest. If harvest is proposed in one of these watersheds, the USFS may apply additional standards or guidelines to mitigate risk to fish habitat, or apply the "no net loss" concept outlined in the TAC's overarching principals.

The following Plan adjustments are considered with the co-intent of shifting harvest activities away from old growth harvest, providing alternative young growth volume, and improving habitat conditions for wildlife and fish and stand function in places that would benefit from restoration work. The TAC defines the broad concept of co-intent as follows:

A mandate to maintain the primary intent and objectives of each LUD and S&G while developing and applying forest management activities that will accelerate the transition to young growth management in the Tongass National Forest.

For the purposes of the recommended flexibilities in young growth management, the overall transition period is defined by the TAC as a period not to exceed 15 years from the date of this Amendment's ROD.

Recommendations

The TAC recommends that in order to achieve these objectives, the USFS:

a) Strive to maximize the volume of young growth timber in planning and ultimately offered for sale.
b) Maximize the use of flexibilities designed to replace old growth harvest with young growth harvest on a one-to-one volumetric basis.
c) Provide more flexibility and opportunities in the existing timber management areas for young growth.
d) Use specific treatments, designed for a one-time entry, for young growth harvest in specified areas that are not currently designated as suitable for harvest during the transition period, provided the original objectives of the particular LUD and/or S&Gs are respected.
e) Aggressively monitor the outcomes of management activities resulting from the transition and apply adaptive management to improve outcomes. Follow the aforementioned review process for the recommended flexibilities made by the TAC for all LUDs and S&Gs. At the culmination of the transition, a full review process should be conducted to evaluate continuity in whole, part, or expanded form to perpetuate and refine prescriptions that improve habitat while providing timber volume where they successfully meet the co-intent objectives. (See Monitoring and Research, pg. 27.)
f) Fully utilize currently allowed prescriptions in beach buffer, Old Growth Reserves, and Riparian Management Areas (RMAs)(outside of TTRA) that improve fish and wildlife habitat and create a commercial by-product. Further, young growth volume produced from these treatments should be counted toward the Projected Timber Sale Quantity (PTSQ).
g) Engage stakeholders, such as conservation interests, timber operations, permitted user groups, and other interested parties, in multi-party planning using an integrated resource management (IRM) planning framework to best design and implement projects to meet ecological, social, and economic goals; to provide best practices for producing timber volume from treatments; and to develop management prescriptions and identify areas where co-intent prescriptions are best applied.

h) Monitor the response of the timber industry and assist in their transition by investing in infrastructure and market development. (See Transition Economics and Investment, pg. 23.)
i) Overhaul administrative practices for timber sales to improve timeliness, lower costs and strengthen supply consistency required in an industry dependent on predominantly young growth. (See Implementation Strategy, pg. 14.)

The TAC is making these recommendations to apply to young growth timber only and would not apply them to old growth timber. (See Old Growth Bridge Strategy, pg. 13.) The TAC recommends that the USFS exercise flexibility within the following areas, LUDs, and S&Gs to increase young growth volumes for the period of the transition as defined above. These areas are listed in order of priority of most return and least environmental risk:

1. Timber management;
2. Modified landscape;
3. Scenic viewshed;
4. Beach buffer;
5. Old Growth Reserves (OGRs); and
6. RMAs outside of TTRA buffers.

Currently Suitable Land Base

The suitable land base refers to the LUDs in the current Plan specifically zoned for timber production: the Timber Management LUD (TM), Modified Landscape LUD (ML), and Scenic Viewshed LUD (SV). These LUDs form the core areas of land management where the bulk of timber harvest will occur during and following the transition on the Tongass. The suitable land base contains 273,000 acres out of the total 435,000 acres on which a second generation of timber is growing within the Tongass National Forest. During the transition period, the TAC's recommendations will bring forward young growth timber volume and support an enhanced timber sale program.

Under the suitable land base and associated S&Gs identified below, the objective of co-intent is to maintain emphasis on the production of young growth timber, while actively managing for concurrent values through treatments that enhance timber establishment and growth within viewsheds and habitat corridors. This definition includes active and progressive treatments that will address stem excluded, growth and undergrowth stagnant stands that inhibit forest habitat, as well as negate any timber values. The goal is to bring those lands back into productive forest and fish and wildlife habitat conditions.

Timber Management (TM)

The Timber Management LUD currently contains approximately 186,000 acres of young growth.

Recommendations

a) Maximize young growth harvest and management on the Timber Management LUD with particular emphasis on stands where culmination of mean annual increment (CMAI) relief, from accelerated establishment, and growth and restart prescriptions can make both short- and long-term contributions to the stability of long term young growth supply.
b) Utilize the full authorities provided under the Sealaska Lands Entitlement Act CMAI language in this LUD for even-aged management of young growth stands.
c) The TAC defined the rotation age under CMAI relaxation for the purposes of modeling as when 50% of a stand volume consists of trees that contain two 34-foot logs. This does not preclude market or site opportunities that occur where CMAI relaxation can be defined in a different manner.
d) Consider using flexibility under the Stewardship Contracting Authority to allow longer sale terms (e.g., five to ten years) to provide more certainty, reduce risk, and encourage investment in infrastructure for all timber sales (young growth and old growth).
e) Continue emphasis on additional opportunities for the small and micro-sale programs and show continuity in small old growth sales for these programs beyond the transition period.
f) Integrate methods to maximize timber establishment and growth (e.g., planting, thinning, fertilizing, etc.) to increase volume, species mix, and/or product value with priority on high productivity sites with favorable logistical access options in the region.
g) Consider a measured pace, scale, and variety of projects to match workforce and capacity. (See Implementation Recommendations, pg. 15.)
h) Prioritize pre-commercial thinning (PCT) projects and regimes on stands in this LUD where highest productivity and highest feasibility of operation.
i) Consider projects that could improve wildlife habitat by rehabilitating young growth stands that are in stem exclusion and will have limited contribution to young growth management. Priority stands will be high and/or medium sites with favorable logistical access.
j) Areas that have been previously harvested should be subject to larger landscape Environmental Assessments (EAs) rather than Environmental Impact Statements (EISs), where appropriate.

Modified Landscape & Scenic Viewshed

The Modified Landscape (ML) LUD currently contains approximately 60,000 acres of young growth. The Scenic Viewshed (SV) LUD currently contains approximately 12,000 acres of young growth.

Recommendations

The TAC recommends that young growth on the ML and SV LUDs, be managed in the same way during the transition period under the S&Gs of the ML LUD:

a) Manage using the Very Low Scenery Integrity Objective (SIO), as described by the Scenery Management System.[7]
b) Re-evaluate some of the existing visual priority routes in a multi-party, community-based review process.
c) Consult early and throughout the project planning process with other users to mitigate impacts in higher value scenic watersheds and/or routes, and encourage transparency throughout the process.
d) Areas of harvest may be replanted favoring spruce and cedar to enhance establishment, green-up, and scenic values.
e) Within the 15 year transition period, on a project-by-project basis and where acceptable, allow a second entry. If the second entry impacts SIOs to Unacceptable levels, seek appropriate relief to implement. Encourage leaving lower value timber to improve scenic and wildlife values.
f) Design cutting units with irregular boundaries (i.e., feathering).
g) Emphasize additional opportunities for the small and micro-sale programs (young growth and old growth).
h) Prioritize PCT projects and regimes on stands in this LUD where highest productivity and highest feasibility of operation.

Currently Non-suitable Lands

The non-suitable land base comprises over 120,000 acres of the total 435,000 acres on which young growth timber is growing within the Tongass National Forest. These lands represent areas of high ecological value; however, many of these stands are in stem exclusion, and do not provide their full potential of ecological values. These lands also tend to have a high level of use for subsistence, tourism, recreation, and guided hunting, and are among the most likely areas to have culturally significant historic sites.

The transition to young growth timber and away from old growth can be accelerated by applying co-intent management. With co-intent as a guide, young growth volume from these areas will count towards the PTSQ while fully meeting the existing intent and objectives of the LUDs and S&Gs. Under the non-suitable land base associated S&Gs identified below, the objective of co-intent is to maintain/improve habitat conditions and long-term ecological

[7] For more information, see *Landscape Aesthetics: A Handbook for Scenery Management*, available online at: http://www.fs.fed.us/cdt/carrying_capacity/landscape_aesthetics_handbook_701_no_append.pdf.

function in young growth stands, while producing timber volume that will count towards the PTSQ, and fully meeting the intent and objectives of the existing LUDs and S&Gs.

The TAC believes the greatest positive impact to both improving fish and wildlife habitat and to increasing the short-term young growth timber supply in the non-suitable lands will be realized by using a one-time only entry into each of the young growth stands that warrant management actions. Additional entries are supported where best available science and active review by a forest collaborative agree that two or more entries are (a) warranted; and (b) meet the LUD objectives. Significant habitat improvement and the total allowed young growth removal would be accomplished in one pass while keeping within the full intent of the LUDs and/or S&G. As a general principle, the TAC recommends providing discretion and flexibility to land managers in order to meet the goal of speeding the shift to young growth and using the co-intent mandate in these areas during the transition period.

It is important to note that the TAC is *not* recommending harvest of any old growth in non-suitable lands and it fully recognizes the importance of these lands for the overall Tongass conservation strategy. Further, the non-suitable lands will not become part of the long-term timber base and are being accessed for a limited period of time to ensure a successful transition.

Old Growth Reserves, Riparian Management Areas Outside of TTRA, and Beach Buffers

Recommendations

The TAC recommends the following activities during the transition period for young growth management in OGRs, RMAs outside of TTRA buffers, and beach buffers:

a) Examine young growth within those OGRs, RMAs, and beach buffers that are now in young growth (early seral stage) and are of sufficient maturity to advance the transition to determine the opportunities for habitat improvement. If active adaptive management would likely facilitate a more rapid recovery of late successional forest characteristics than would leaving it alone, the TAC recommends co-intent management activities that advance the seral stages toward Tongass old growth conditions, while creating commercial timber by-products.
b) Treatments in any of the non-suitable lands would include a maximum opening size of 10 acres and maximum removal of up to 35% of acres. Treatments should be designed on a project-by-project basis with the co-intent objectives listed in (a).

c) The USFS should prioritize utilizing OGR modification processes to capture additional young growth acres within OGRs, putting particular emphasis on adjacent landscapes, where a net gain of productive old growth habitat is possible, while maintaining and enhancing landscape connectivity.[8]
d) Where OGR boundaries cannot be modified, the USFS should use the co-intent mandate on young growth stands in OGRs and implement treatments where non-timber values are not compromised, and particularly where adjacent stands of young growth exist and can be integrated into the project scope.
e) The USFS and involved stakeholders are encouraged to be creative and innovative in developing projects that advance old growth characteristics in young growth stands within non-suitable lands. Emphasis should be on emulating the natural scale and distribution of disturbance patterns on the Tongass (e.g., wind-thrown timber that creates gaps and patches, landslides that create corridors and gaps, mortality that naturally thins stand, etc.) that correspond with silvicultural treatments such as gaps, corridors, variable retention harvest, and variable density thinning.
f) Treatments within beach buffers must maintain a minimum 200 foot buffer starting at the high tide line. USFS staff may consider expanding the buffer in sensitive areas, (e.g., such as in proximity to estuaries). Wildlife treatment enhancements and openings for access purposes may be allowed within those 200 foot buffers.
g) The USFS should prioritize projects that improve habitat and forest function, increase accessibility for recreation and tourism, and provide young growth volume in support of transition goals.
h) The USFS should consider prescriptively planting within two seasons of harvest to accelerate both establishment and growth of successive forest cover to meet the habitat and/or scenic objectives.
i) The USFS should review permits and current usages within proposed project areas in the non-suitable lands (including operators who hold tourism and guiding permits) to avoid conflict (analyze impacts) and seek mutually beneficial opportunities. Permit holders, local users, and user groups should be consulted and integrated in planning in the development of any management activity.
j) To the extent possible, these projects should also provide outputs such as recreational infrastructure and improved access.

[8] The current Forest Plan uses the approach of comparable achievement to adjust Old Growth Reserves, provided that alternative reserves provide comparable achievement of the old growth habitat goals and objectives. The Tongass National Forest 2008 Land and Resource Management Plan is available at: https://fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5367422.pdf. See Appendix K of the Forest Plan for additional information.

Old Growth Bridge Strategy

The TAC agrees that the USFS should:

- Complete a thorough analysis of young growth inventory at the stand level in the first three years of the transition to more accurately predict the young growth timing and supply to complete the transition;
- Develop the unit pool for bridge timber volume to meet the timeline goals set below (1 and 2);
- Plan and produce sufficient young growth volume to ensure the required volume through the transition meets the determined demand;
- Transition from old growth to young growth in less than 15 years by making more young growth available for harvest and substituting young growth for old growth on a one to one volumetric basis, using the annual timber demand;
- During the transition period, hold the timber demand number constant. (Subject to review of the DEIS, the TAC will recommend a number to hold consistent through transition period.[9]);
- Maintain a post transition annual old growth timber harvest that will meet the long term demand of the small and micro-sale programs; and
- Limit the old growth timber base to the current definition of Phase 1 lands outside of The Nature Conservancy (TNC)/Audubon conservation priority areas, Tongass 77 (T77) watersheds and Inventoried Roadless Areas. (See Appendix D, pg. 38, for a map of the conservation priority areas and T77 watersheds.)

Goals for planning the unit pool for the old growth bridge timber volume from the defined land base development:

1. All timber pool volume is through Gate 1 by year two through extensive collaboration with other landowners and stakeholders.
2. All timber pool volume is through Gate 2 (National Environmental Policy Act (NEPA) cleared) by end of year five.

At the end of five years from the ROD of this Plan Amendment, there will be more experience and knowledge because:

- A forest collaborative will have completed a review of USFS performance on planning timber sales;
- There will be five years of experience in planning young growth timber sales aligned with the TAC recommendations that will improve the understanding of actual project net-downs and allow for more accurate predictions of young growth harvest timing and flow; and

[9] The TAC expected to see an analysis by the USFS of the effects of two different annual volume targets. After reviewing the DEIS, which did not include an analysis of two volume targets, the TAC was unable to reach consensus on an annual volume target. The range of annual volumes supported by individual TAC members for analysis remains at 46MMBF – 70MMBF. The TAC did *not* agree to a specific annual target.

- The improved inventory information will be available and integrated into the forecast of both the timing and volume of young growth during the remaining period of the transition and set a target timeline for old growth harvest to complete the transition.

Implementation Strategy

Purpose

The Forest Plan Amendment is but one piece of the transition to a young growth forest management program. The other major piece is for the USFS to transition to a more flexible, responsive timber program tooled for young growth. The recommendations above should increase the certainty of young growth supply. The implementation steps below will ensure that projects are available and delivered in a manner that leads to a viable industry while not diminishing other values of the forest.

These implementation recommendations provide guidance on crucial elements for success. They also identify critical opportunities by which the Committee, Agency, and greater community will share ownership of the transition strategy and embrace its successful implementation. While much of the economic success of the transition will depend upon the willingness and ability of communities, businesses, other landowners, and the forest products industry to learn, adapt, and innovate, the TAC believes that the USFS must play a pivotal role in leading, fostering, and supporting the societal and institutional learning a successful transition will require. The USFS will, of necessity, be in transition itself.

In the absence of Agency transformation, the TAC remains extremely concerned that the collaborative efforts of the TAC will be in vain.

Essentials of the Transformation: Leadership and a Culture of Collaboration and Transparency

Agency Leadership

Any and all transitions come with risk and uncertainty. Agency leadership will be challenged to provide clarity of purpose and consistency of direction to all staff of the Tongass National Forest. Likewise, all stakeholders, users, and user groups will look to Agency leadership for clear commitments in terms of budgets, staffing, planning, and implementation in order to make their own adjustments to changing conditions. The next 15 years will be a learning process, but action must take place immediately. Leadership must foster a culture of flexibility, transparency, creativity, and innovation, as well as new institutional practices to successfully meet the Secretary's young growth direction, institutionalize learning, and manage risk throughout the transition period, while still meeting the high demands of accountability and compliance with existing laws and regulations.

Recommendation

a) The TAC expects Forest Service line officers and leadership at every level to encourage and support the development of a multi-stakeholder forest collaborative to help maintain the vision of the Amendment, provide resources to the Agency for the implementation steps described herein, and improve and compliment the monitoring efforts necessary for accountability and learning. (See Monitoring and Research, pg. 27). The agency's support for such a group should include both participation and funding. (A suggested draft memorandum of understanding (MOU) can be found in Appendix E, pg. 39.)

It is the intent of the TAC that stakeholders, stakeholder groups, and the Forest Service seek to increase efficiency and effectiveness during and beyond the transition period. We acknowledge the tension caused by the need for collaboration and the pressing desire for action. We consider this a mutual challenge.

Collaboration and Transparency

The TAC has succeeded because its members agreed at the outset to collaborate (i.e., to work together towards a common goal) and to do so with respect, honesty, and transparency. The TAC has taken great pains to access the knowledge base and values of many stakeholders, explain the process used to reach decisions, and detail the rationale for those decisions. We likewise went to lengths to explain the innovative concepts of co-intent and co-products expected from young growth management. This agreement to manage for multiple purposes, including fish and wildlife enhancement while developing timber supply, is challenging. It brings opportunity for new styles of conservation and silviculture to the Tongass which will require the utmost collaboration and transparency. The Forest needs to commit to these values in implementing the transition if the hard won agreements we have achieved are to endure.

Collaboration and transparency mean frequent engagement *and* taking action with partners, sometimes with risks where all parties learn. Risk *management*, as opposed to risk *aversion*, by Agency leadership will create the space for flexibility, creativity, and innovation among the Forest staff and stakeholders. Collaboration and transparency are the best risk mitigation tools the Agency has at its disposal to navigate what will be a difficult period and to take advantage of new opportunities. Risk sharing by all stakeholders, and most importantly the Agency, will speed the transition and make sure the private sector is not assuming a disproportionate degree of risk.

Implementation Recommendations

The USFS has already expressed its commitment and made important investments in the shift to a young growth-based forest management program and an IRM approach.

Building on that commitment and those investments, the TAC recommends the following transformative steps for successful future young growth forest management:

1. Pursue partnerships and collaboration;
2. Support internal USFS Coordination;
3. Encourage leadership at the District Ranger level commensurate with their authority;
4. Revamp the sale planning and assessment process;
5. Maximize the use of stewardship contracts and agreements; and
6. Address incentives and feasibility for operators and domestic processing/consumption.

Partnerships and Collaboration

Community-based partners and stakeholders can lead and support creative work by building mutually beneficial agreements and working relationships, facilitating collaborative processes, and ensuring projects achieve local benefits.

Recommendation

a) Line officer performance evaluation must include metrics for partnerships, collaboration, and transparency (self-reported and stakeholder-reported).

Partnerships will be needed to achieve the social and economic outcomes envisioned by the TAC and enabled by the 2016 Amendment. These include:

Planning for Young Growth Projects
The TAC expects the Agency to move to true collaborative planning for young growth projects. Collaborative planning has the advantage of using the knowledge of industry to design projects that will work economically, and the knowledge of the scientific and conservation communities to design projects that will achieve the desired habitat objectives, and of local communities and/or user groups to identify areas critical to community development. It provides the opportunity for mutual learning through the assessment and analysis stages of planning. It produces the commitment of willing partners in the implementation of the Amendment ROD.

Recommendation

a) Give clear direction to staff that collaborating early and often in the Gate 1 process and in other ways, with stakeholders, including industry, is expected for all projects in the Five Year Plan.

Workforce Training and Development
There is an opportunity to work with local governments, tribes, non-profits, businesses, and the State to create a local, multi-skilled, cross-trained workforce to perform all facets of young growth forest management, habitat restoration, and local utilization.

Recommendations

a) Utilize the Alaska National Interest Lands Conservation Act (ANILCA) or similar hiring authorities, and agreements or MOUs with partners, adjacent landowners,

and business owners, to provide training opportunities and continuity of work for a local workforce.

b) Implement vocational-technical training programs in coordination with local high schools and regional universities. Integrate training with current vocational-technical training in marine services and fisheries. With local partners, consider a program to develop USFS internships for local students, to complement the youth conservation corps and other existing programs.

c) In response to a directive in the recent Farm Bill addressing disease and infestation, the USFS is seeking new methods of utilizing yellow cedar. Explore the opportunity to work with local Native carvers who use the wood for their products.

Coordination with Other Landowners

There are unrealized opportunities for cost savings through coordination among adjacent or nearby landowners. These include: sharing the costs of road building crews, log transfer facilities, ships or shipping companies, helicopter logging companies, survey contractors, thinning crews, marketing experts, and/or other strategies. In addition, project-level cumulative effects analyses conducted for watershed and island-to-island linkages should be improved through coordination with adjacent landowners.

It will require an intentional effort by the USFS to initiate dialogue with other landowners when creating future silviculture and harvest plans to encourage coordination across ownership boundaries. This will incentivize mobilization, create economies of scale, and help ensure continuity of supply for existing and emerging businesses.

Recommendations

a) Increase participation in the All Lands Council and/or establish a new group with similar objectives.

b) Collaborate and/or consult with area landowners on the Five Year Plan.

c) Execute agreements for shared infrastructure among landowners.

d) Provide shared database access to young growth models for other landowners.

e) Work with researchers to take an all-lands approach to research projects in the region.

f) Begin working together on the Kosciusko landscape.

Improved Public Outreach and Messaging

In addition to planning, an emergent forest collaborative and other stakeholders can help with public outreach, messaging, transparency, monitoring, and shared learning.

Recommendations

a) Utilize the networks established by local and regional forest and landscape collaboratives, Communicate with the greater public through national and local media and via regular community briefings, open houses, and non-NEPA required

meetings. Use existing public forums to engage in dialogue regarding the progress of the transition.

b) Working with stakeholders and working group(s) that emerge from forest collaborative(s), prepare pre- and post-project reports to the public about what was planned and what happened with the project or activity. Highlight positive results, such as collaborative planning, restoration, workforce development, jobs, and injection of capital into the economy, and identify areas not meeting expected outcomes in order to address options through future efforts.

Inclusion, Transparency, and Shared Learning

As mentioned, the TAC expects the Agency to move to true collaborative planning for all timber projects.

Recommendations

a) Give clear direction to staff that collaborating early and often with stakeholders, including industry, is expected for all projects in the Five Year Plan.

b) Design and implement a simple after-action review with project collaborators for the purpose of identifying opportunities to make the projects achieve better outcomes in terms of efficiency and effectiveness. Document and share. (See Monitoring and Research, pg. 27.)

Internal USFS Coordination

Collaboration across the Forest is an essential ingredient for a successful transition, starting with clear direction from leadership that internal collaboration and cross-district communication is the expected norm. At times in the past, some attempts at internal coordination have lost their impact because of the inability of staff to escape the traditional programmatic areas, budgets, and targets. The current primary purpose approach to resource allocation, which constrains already limited resources to achieving a single objective, is one of the barriers. The co-intent concept the TAC recommends necessitates resource allocation across internal boundaries and requires very different internal budget and target systems. Interdisciplinary teams (IDTs) on co-intent projects will be collectively resourced and held to clear processes and timelines on deliverables by the Tongass Leadership Team (TLT) and a forest collaborative if present. These conditions make each team member equally responsible, balances power, and leads to IRM as envisioned.

Recommendations

a) Explore the use of Integrated Resource Restoration-like budgeting.

b) Create an internal environment that invites collaboration among USFS staff and team members – including office space, co-location, etc.

Support and Encouragement for District-Level Leadership

The TAC has taken risks in suggesting more proactive adaptive treatments to accommodate a quicker transition, including reduction of old growth harvest. If the TAC's recommendations are to have any value or impact, District Rangers must be empowered to use all their existing authorities to expedite projects and collaboration in order to generate additional young growth timber sales. This runs counter to the current culture in which District Rangers, in order to be safe and not take any risk, simply layer on IDT suggestions for protection, without paying attention to redundancies. This pattern too often leads to a collision of restrictions that result in low volume and non-economic projects without any real additional resource protection, or extinguishes projects altogether.

Recommendations

a) Give District Rangers strong direction and support from above to fully exercise their authority to implement projects that are balanced, timely, effective, and efficient.
b) Give District Rangers strong direction and support to take into account collaborative partner input in designing and implementing projects. Partner work should be considered a value to the process, rather than an imposition.
c) Give District Rangers clear performance measures that include not only accomplishments but also multi-party evaluations of the skill sets associated with successful internal and external collaboration.
d) Define entry points for collaborative input and engagement pre-and post-season and pre-NEPA.

Sale Planning and Assessment Process

The Five Year Timber Plan

The Five Year Plan should become a reliable strategic document which allows stakeholders to understand the projected ramp-down of old growth and the ramp-up of young growth sales, including the small and micro-sales of both old growth and young growth. These projections must become credible and reliable through a deliberate process by the Agency. Credibility is established through 1) strict adherence to schedules; and 2) continuity of supply insured by a "pipeline" or inventory of shovel-ready projects to allow for unexpected interruptions.

Recommendations

a) To help with transparency and clarity, the Five Year Plan must differentiate between old growth, young growth, small sales, and micro-sales.
b) Provide a clear definition of small and micro-sales, and if there is a difference in implementation of old growth versus young growth small and micro-sales, this needs to be clearly outlined and communicated.

c) Provide inventory analysis and reliable volume and harvest data for each project to provide industry with some certainty.
d) Involve industry in consultation, up-front and early, without precluding ability to bid.

Supply/Demand Planning Methodologies
At present, demand and target numbers (MMBF) are calculated through a few different political, regulatory, and legal processes. This layered authority creates uncertainty for stakeholders.

Recommendation

a) At five and ten year reviews, the USFS with a forest collaborative, if present, and other stakeholders shall study, identify, and adopt methodology for supply that is tied to future sustained yield from the young growth land base. This new orientation will provide opportunities for the growth and development of an integrated industry focused on community and ecosystem health.

Cross-District Coordination and Strategic Planning
Young growth timber that will be available in the near-term is scattered across the Forest; yet a scattershot approach to planning sales is not cost effective. Stronger coordination across districts, and between districts and programs, will be critical to meeting young growth benchmarks.

Recommendation

a) Implement a strategic process for the scale, size, and scheduling of projects – for both young growth and old growth – to assist businesses struggling with small profit margins so they have time and incentive to invest in new markets and products.

Small Sale Program
The purpose of small sales is to provide opportunity for small operators to access timber for local product manufacturing. Often, small operations represent the best opportunity to encourage more value-added production and local consumption of wood products. However, following the initial NEPA review and pooling, small sales often get lost or delayed, leaving businesses that depend on those sales with limited or no supply. There is a need for more dedicated staff involvement in the timber sale preparation process for small sales from existing NEPA pools.

Recommendation

a) Establish one or more dedicated small-sale teams, specifically tasked with small sales, micro-sales, salvage sales, personal use, and other non-traditional timber sale opportunities, where this is its only function. This will sustain small businesses, and foster and encourage innovation. The team must be provided with the requisite

resources and support, able and encouraged to do NEPA and/or pre-sale work as needed, and be subject to accountability mechanisms and incentives.

Programmatic Environmental Assessments

Recommendation

a) Sales of young growth in areas that have been previously harvested should be subject to larger landscape Environmental Assessments (EAs) rather than Environmental Impact Statements (EISs), which are appropriate for the size and scope of these projects.

Maximize Stewardship Contracts and Agreements including Tribal Stewardship Authority

In many cases, especially in the projects designed with co-intent, stewardship contracts and agreements will be the best tool available to ensure co-intent is met. The requirements and opportunities of stewardship contracts and agreements are particularly useful, and include:

- The requirement for collaboratively planned projects, allowing the Agency to continue to avail themselves of the knowledge of conservation and scientific communities, industry, local communities, traditional communities, and other stakeholders at the project-level.
- The authority to use "designation by description" and "designation by prescription" allows the Agency to lower costs and encourages the development of a highly skilled private sector workforce to meet the intent of the Amendment.
- The authority to award a stewardship contract up to 10 years in length can give industry the continuity of work it needs to justify investment in retooling.
- The opportunity for pooled "retained receipts" (as piloted by the Tongass Collaborative Stewardship Group) allows the Agency to provide dedicated funds for off-project stewardship and restoration work.
- The emphasis on "Best Value" criteria for awarding contracts (as opposed to low-bid) allows the Agency and stewardship collaborative to define best value and set scoring – in terms of the goals of the Amendment (e.g., meeting co-intent, maximizing local benefit, providing job training, etc.).
- The authority to allow a stewardship collaborative representative to be on IDTs and review teams for contract award deepens collaborative relationships.
- The monitoring requirement will help the Agency and collaborators institutionalize learning.

Recommendations

a) Take full advantage of the stewardship contracting authority for all the preceding reasons.

b) The TAC requests that a special dedicated Fish and Wildlife Habitat Enhancement Fund be established within the retained receipts pool, to be used for projects sponsored by non-governmental organizations (NGOs), identified and prioritized through a collaborative process. We further recommend that the 20 percent match required by current USFS agreements be waived, or significantly reduced, for this body of work.

Incentives and Feasibility for Timber Operators

Risks, Costs, and Process

This section provides recommendations for reducing risk, reducing costs, and simplifying processes in order to incentivize the participation of timber operators and increase the economic feasibility of the young growth program.

In order to effectively utilize various tools (whether grants, agreements, or contract provisions), a shared vision and clarity of purpose across the Agency, and with partners, will be key. It is essential that Agency leadership and staff communicate and understand the range of authorities available, and interpret and implement with consistency across the Forest.

Recommendations

a) In year one of the transition, meet with a forest collaborative, or working group thereof, to develop effective collaborative practices and procedures for the Gate 1 process and old growth timber pool volume.
b) Consider changes to reduce cost in scaling and harvesting of young growth stands.
c) Revise the residual-value appraisal system through a Forest-wide, multi-stakeholder evaluation process to establish stumpage rates that accurately reflect the profit and risk margins in young growth sales.
d) Remove bid bonds for predominantly young growth small and medium-sized sales, and consider reducing bid bonds for small old growth sales.
e) Consider reducing performance bonds for small and medium sized sales that are predominantly young growth.
f) Coordinate with road engineers, planners, and transport planners on open roads to avoid closures before all sales are complete, as well as with other landowners.
g) Use the knowledge of potential contractors in initial sale design for projects with restoration intent in order to maximize economic feasibility and communicate desired restoration outcomes.
h) Meet at least annually with collaborative members and contractors to identify additional strategies to reduce costs.

Incentives and Feasibility for Increased Domestic Processing and Consumption

Recommendations

a) Increase the use of local processing credits in young growth sales, regardless of size or location, to capture as much economic opportunity as possible and reduce economic leakage.
b) Award some long-term stewardship contracts to provide continuity of supply to reduce retooling investment risk.
c) Offer sales with volumes appropriate to the scale of existing and emerging local processors.
d) Encourage the USFS to look first at locally produced Tongass forest products for all USFS projects in the region.[10] Work with USFS engineering and design personnel, as well as procurement, to set up the process. Engage the USFS Forest Products Lab in any questions regarding grade and quality.

Transition Economics and Investment

Introduction

The transition to young growth must provide economically and financially viable opportunities for industry, and meaningful economic and employment benefits to local communities. Targeted investment, financial assistance, and financing mechanisms are needed to help the communities and businesses successfully transition to and thrive within a new young growth economy.

The TAC categorized the investment recommendations into the following five categories:

1. Inventory;
2. Research;
3. Infrastructure;
4. Retooling; and
5. Financing Mechanisms.

[10] In Ketchikan, local bus shelters were constructed using locally sourced wood. Similarly, in Sitka, the University of Alaska Southeast (UAS) used local wood products to build a visitors' kiosk for the Convention and Visitors' Bureau. Young growth wood has also been sourced for a bike shelter, high school vocational training projects, and local home construction projects. While these examples are not specific to USFS projects, they offer example of local consumption of Tongass timber.

Investment Recommendations

Inventory Investment

Young growth resource data evaluated by the TAC carries a very high margin of uncertainty in regard to the reliability and accuracy of information. The TAC recommends investment in stand-level field work to: 1) ground-proof and refine inventory and growth data; 2) improve inventory accuracy; and 3) increase reliability of forecast projections for future resource management and investment activities.

Recommendations:

Improve Stand Level Young Growth Forest Inventory:

a) Update and expand stand exams and inventory.
b) Update and expand growth and yield studies.
c) Provide additional focus on information for cedar and alder.
d) Include integrated resource inventory.

USFS, State, and private sector forestry experts believe a budget of $5,000,000 would be necessary to improve accuracy of data and geographic information system (GIS) layers to levels needed to support responsible resource management decision-making.

Research Investments

There is limited information available on growing, managing, harvesting, processing, manufacturing, and marketing of young growth timber within Southeast Alaska. Additional research regarding young growth silviculture and operability is necessary to support a viable transition. Research activities should include significant and meaningful private sector engagement, guidance, and leadership to assure that deliverables are beneficial to industry.

Recommendations:

a) Invest strategically in the following research areas:
    i. New harvest techniques
    ii. Small log manufacturing processes
    iii. Site-specific use of wood biomass
    iv. Silviculture
        - Consider tree planting for species manipulation and speeding harvest rotations.
        - Evaluate effectiveness of different stand thinning treatments.
        - For stem excluded, stagnant stands consider, conversion to a new stand.
        - Evaluate site preparation (e.g., slash treatments, mounding, etc.)
        - Review current forest research on fertilization and genetics and determine applicability to Southeast Alaska.
    v. Product and market development

- Transitioning to a young growth resource requires existing businesses to adapt their business model and develop new products and markets. As part of the USFS commitment to the transition and commitment to provide assistance to communities and businesses, world market analysis and products demand analysis may help encourage business transition, enhance local livelihoods, and maintain economically viable communities.

b) The USFS should fully utilize local wood products in their own projects thereby providing a showcase for local businesses and Tongass wood.

Infrastructure Development Investments

Affordable planning, harvesting, transportation and manufacturing will be critical to establishing an economically viable and globally competitive young growth timber industry in Southeast Alaska. At present, the region is significantly disadvantaged due to lack of critical infrastructure, including roads, affordable energy sources, and marine infrastructure.

Recommendations:

a) Connect critical road systems (e.g., Ketchikan Saddle Lakes), and designate utility corridors for future renewable energy and hydropower infrastructure.
b) Establish adequate docks and log transfer facilities within five logistic "working circle" areas: Hoonah, Kake, Wrangell, Klawock, and Ketchikan.
c) Establish adequate land- and water-based log storage facilities within these five "working circles."
d) Assure adequate marine logistical service infrastructure (e.g., ship and barge moorage systems), within these five "working circles."
e) Assure affordable energy in "working circle" communities:
    - Ensure that access to renewable energy, including hydropower, is assured via the Forest Plan.
    - Provide loan or grant funding mechanisms.
    - Provide energy subsidies, tax credits, and/or other cost offsets for young growth manufacturers.

Retooling Investments

Businesses have expressed interest in opportunities created through increased availability of young growth. However, retooling costs associated with transitioning to a young growth-based timber economy are significant, and beyond the means of most of the limited, remaining industry. Strategic investments that enable businesses to retool could make the difference between prosperity and business closure.

Recommendations:

a) Manufacturing facilities for small logs.
b) New harvesting equipment:
   - Small log cable yarding systems; and
   - Low ground pressure logging machines.
c) Biomass facilities utilizing young growth.

Financing Mechanisms

Uncertainty associated with supply of older-age young growth and old growth timber supplied by the USFS is a tremendous impediment to raising capital for timber sector business activities. There will likely be lower profit margins associated with young growth, as industry transitions through trial and error, and as market demand for young growth projects is gradually created. The following financing mechanisms and incentives will help mitigate those factors, and make it possible for businesses to survive through the transition and beyond.

Recommendations:

a) **Federal loan guarantees,** which will ensure repayment of lenders in the event the USFS is unable to provide suitable volumes of timber. This will ensure that private sector businesses and lenders are protected and can recover their investment in the event that a business fails due to reasons associated with the USFS.
b) **Federally-purchased risk insurance**, which will assure repayment of lenders in the event the USFS is unable to provide suitable volumes of timber. This will ensure that private sector businesses and lenders are protected and can recover their investment in the event that a business fails due to reasons associated with the USFS.
c) **Increased profitability:** Increase the allowable profit percentage in the young growth appraisal process. This will help encourage, incentivize, and reward new investment in the young growth industry, while providing addition room for trial and error, which will surely occur throughout the transition process.
d) **Cost Recovery Relief ("Buy-out")**: It is anticipated that the changes created through new federal policy within the Tongass may prevent some harvesting and manufacturing operations from maintaining economically viable operations, and from recovering their existing investment. The federal government should offer an option to buy-out these businesses' existing assets at fair market value, as a means of compensating these businesses for the new economic hardship and obsolescence imposed upon them. This manner of economic relief has precedence under ANILCA. The TAC recognizes this type of relief as a last resort; however, it will likely be necessary to offset the economic harm associated with new federal policy within the Tongass.

- **Economic Hardship Relief:** Loss of businesses and associated employment will cause economic harm to Southeast Alaska communities. Communities should be compensated for direct and indirect economic harm which they may be subject to due to the federal government's new young growth strategy within the Tongass (e.g., lost employment, tax revenue, population out-migration, etc.). This could be achieved through a formula-based funding mechanism.
- **Hardship Relief and Increased Competitiveness through Access to Renewables.** Relief to communities can also be provided by ensuring that the Forest Plan guarantees increased access to new renewable energy and hydropower resources within the Tongass. This will allow communities to enjoy more affordable energy for current purposes and future growth, while also supporting the growth and prosperity of a new young growth manufacturing industry through more affordable renewable energy.

Monitoring and Research

Monitoring Principals (*Why*)

- The TAC's commitment to creating conditions for Tongass communities to thrive is reflected in its recommendations toward robust and active monitoring and adaptive management.
- The following monitoring recommendations are designed to improve and complement with existing monitoring efforts and those under development in spring 2016.
- Measuring and telling the story of socioeconomic impacts of Forest policy and practice can build support for sustained investments on the Tongass.
- The recommended actions represent a new paradigm for monitoring on the Tongass, and situate the forest at the leading edge of active and adaptive management in the U.S. The TAC expects the Agency and stakeholders to take on the challenge of adopting this paradigm.

Monitoring Recommendations (*How*)

Recommendations

a) **Support an emergent forest collaborative:** The TAC recommends that the USFS encourage and support the development of a multi-stakeholder collaborative to help maintain the vision of the Amendment. The TAC further recommends that the Tongass National Forest and the emergent collaborative enter into an MOU to formalize their exchange of information and sense of responsibility to a successful transition. (A suggested draft MOU can be found in Appendix E.)

The TAC believes a useful emergent forest collaborative will, for the duration of the transition:

- Embody, and help the USFS fulfill responsibility to, the types of shared learning and feedback required by the 2012 Planning Rule (36 CFR 219.4(a), 219.5(a), and 219.12(c)(3));
- Improve and complement traditional, implementation, and effectiveness monitoring at project- and Forest-levels (see recommendations (b) and (c) in this section);
- Be available to the USFS to provide recommendations on project-level decisions (with a focus on innovation, risk, and benefits to local communities), especially through after-action reviews and Gate 1 consultations on important or precedent-setting projects;[11]
    - All multi-stakeholder after-action reviews should:
        - Identify what worked well;
        - Identify what worked poorly; and
        - Develop a plan for how to transfer these learning outcomes to future projects. Transfer must happen across ranger districts, must have individual point people identified, and should identify what future projects are targeted, where possible.
- Have the resources to support social science and applied research activities necessary to conduct implementation and effectiveness monitoring that complements the agency's, and facilitate collaboration in low-capacity communities;
- Develop a practice of regular, formalized check-ins with the full TLT, RLT, and WO; and
- Steward the values associated with action items of the transition, including but not limited to, co-intent projects on non-suitable lands, support of a viable forest products industry, and USFS transformation and leadership.

b) **Vastly improve metrics tracking the flow of benefits to communities in the TNF monitoring plan:** The TAC recommends the USFS integrate the key metrics identified as "dashboard" (listed below) and full social benefits metrics (outlined and described in Appendix F) into the monitoring plan under development in spring 2016, and change other Agency practices as needed to fully engage these metrics. Any contracts for monitoring should be awarded in-region, in-state, or relocated to an in-state institution after expert development. The TAC understands this

[11] Post-project effectiveness monitoring on the Heceta project, where State and the USFS conducted second growth commercial thinning and harvest using a range of techniques and approaches, could offer an insightful case study. For example, effectiveness monitoring could explore: how did this work and how could a similar project work better? The group should examine contracts, operability, soils, deer browse, other habitat needs, coordination between landowners, impact on workers' communities, and other values.

recommendation dovetails with the requirements of the 2012 Planning Rule, 219.12(c)(3).

c) **Maintain a transparent and timely exchange of information about monitoring and implementation with an emergent forest collaborative and the public:** The TAC recommends that the Agency maintain open and transparent planning, implementation, and monitoring practices to facilitate complementary implementation and effectiveness monitoring by a forest collaborative. Ongoing monitoring by the Agency and any external groups should demonstrate changes over time in the relationship between (x) planning and implementation of timber and stewardship work on the Tongass, and (y) community well-being. The TAC understands this recommendation dovetails with the requirements of the 2012 Planning Rule, 219.12(c)(3).

Dashboard Metrics (*What*)

Arrows reflect the direction of change the TAC expects to see during the transition; some metrics do not have expected trends. The Forest and a forest collaborative should coordinate reporting to keep the RLT and WO up to date on progress of the transition and make information public in a timely and accessible way.

- Number and volume of timber sales planned, offered, and sold; split out to show the following at each project stage or gate:
  - Number and volume of young growth ↑;
  - Number and volume of old growth ↓; and
  - Number and volume of small and micro-sales ↑.
- Number and outputs of co-intent projects planned, offered, and under contract; split out to show quantity and quality of projects on suitable versus non-suitable lands, and including:
  - Type, scale, and quality/effectiveness of habitat improvement, including understory vegetation response, deer populations, connectivity effects for key species, and additional biophysical metrics as needed, to be decided by multi-party planning at the project level ↑;
  - Volume of commercial wood products;
  - Use of commercial wood products;
  - Cost of habitat improvement planning and implementation; and
  - Number and names of parties monitoring project(s) for socioeconomic and ecological effectiveness.
- Number and value of private sector jobs (direct, indirect, and induced) associated with the transition—publicly or privately employed or contracted—and percentage of those jobs hired or held by local (census area or borough) residents; split out to show,
  - Number and value associated with timber sale preparation;
  - Number and value associated with harvest;
  - Number and value associated with wood products processing; and
  - Number and value associated with co-intent projects.

- Number of public construction and maintenance projects using Tongass wood products and estimated value contribution of the wood. Includes USFS, local governments, and special districts (e.g., school districts, soil and water conservation district etc.).↑
- Number and scale of biomass projects in Southeast Alaska (operating and newly constructed). Consult with appropriate agencies or organizations already tracking this metric.
- Number and value contribution (cash and in-kind) of stakeholders involved in transition and habitat improvement planning, implementation, and monitoring; split out to show:
    - Collaborative planning processes, including but not limited to, stewardship contract design and award ↑;
    - Grants and agreements;
    - Project implementation;
    - After-action reviews ↑;
    - Multi-party monitoring ↑; and
    - Pooled receipts application and awards process, and project implementation ↑.

Appendix A: Tongass Advisory Committee Members

Federally Recognized Tribes, Alaska Native Organizations, and/or Alaska Native Corporation representatives

Jaeleen Araujo – Juneau, AK

Richard Peterson – Kasaan, AK

Woody Widmark – Sitka, AK

Alternate: Robert Mills – Kake, AK

National or regional environmental and/or conservation organization representatives

Brian McNitt – Sitka, AK

Keith Rush – Juneau, AK

Andrew Thoms – Sitka, AK

Alternate: Chris Rose – Sutton, AK

Timber industry representatives

Les Cronk – Ketchikan, AK

Eric Nichols – Ketchikan, AK

Wade Zammit – East Sound, WA

Resigned: Philip Hyatt – Thorne Bay, AK

Federal, State, and local government representatives

Chris Maisch – Fairbanks, AK

Carol Rushmore – Wrangell, AK

Kate Troll – Juneau, AK

Resigned: Wayne Benner – Thorne Bay, AK

Other commercial users, those holding land use permits, or the public at large

Lynn Jungwirth – Hayfork, CA

Kirk Hardcastle – Juneau, AK

Erin Steinkruger – Portland, OR and Coffman Cove, AK

Alternate: Jason Custer – Ketchikan, AK

Appendix B: TAC Charter

United States Department of Agriculture

USFS, Tongass National Forest

Alaska Region

CHARTER

1. Committee's Official Designation

Tongass Advisory Committee

2. Authority

The Charter for the Tongass Advisory Committee (Committee) is hereby established under the authority of the Secretary of Agriculture in accordance with the provisions of the Federal Advisory Committee Act (FACA) as amended, 5 U.S.C. App. 2.

3. Objectives and Scope of Activities

The Committee will advise the Secretary of Agriculture, through the Chief of the USFS, by providing advice and recommendations for developing an ecologically, socially, and economically sustainable forest management strategy on the Tongass National Forest. Recommendations and advice may inform the modification of the 2008 Tongass Land Management Plan.

This forest management strategy will emphasize a shift to young growth management. The rationale for shifting to a predominantly young growth-based forest management program is explained in the January, 2013 Leader's Intent Paper, providing overall direction for the Committee. The 5-Year Tongass Integrated Plan (TIP), released in May 2013, identified old growth timber sales that can provide a bridge to support a transition within 10 to 15 years in a way that is economically viable for the existing industry. The Secretary's July 2, 2013 Memorandum Addressing Sustainable Forestry in Southeast Alaska also directed the identification of young growth and restoration projects that could be completed over the next five years, as well as shifts in staff and financial resources towards young growth management. Planning, integration and funding of that program of work will be driven and guided by work on key projects with collaborative partners.

4. Description of Duties

The Committee will be solely advisory in nature. All activities of the Committee will be conducted in an open, transparent, and accessible manner. The Committee will be

asked to perform the following duties or other requests made by the Secretary or Chief:

a) As necessary and appropriate, identify the key elements to be considered for a potential Forest Plan modification assuming young growth is the focus of vegetation management in the future, while recognizing and balancing the other unique and equally important resource values of the Tongass, such as tourism, recreation, fishing, subsistence, and renewable energy.
b) Offer recommendations on the suitable and available land base for developing an ecologically, socially and economically sustainable forest management program on the Tongass National Forest with emphasis on young growth management. Considerations include standards and guides and land use designations for a future modification of the Tongass Land Management Plan.
c) Provide advice on how to speed the shift from predominately old growth management to predominately young growth management, in a way that is economically viable for the existing industry. This may include consideration of options for managing stands.
d) Offer advice on opportunities to work cooperatively with other landowners on an all lands young growth forest management strategy.

5. Agency or Official to Whom the Committee Reports

The Committee will report to the Secretary of Agriculture, through the Chief of the USFS.

6. Support

Clerical and administrative support will be provided by the USFS. The Tongass National Forest and Alaska Region will also provide significant technical support to the committee to ensure members have access to appropriate and relevant data as needed.

7. Estimated Annual Operating Costs and Staff Years

Members of the Committee will serve without compensation. In performance of their duties away from the homes or regular places of business, Committee members may be allowed reimbursement for travel expenses in accordance with Federal per diem rates for attendance at meetings as authorized by 5 U.S.C. 5703. All expenses will be subject to approval of the Designated Federal Officer (DFO).

Estimated annual operating costs for the committee is $980,000 including; travel, lodging and per diem, committee facilitation, administrative support expenses, and Federal staff support (estimated as four full time equivalents staff per year). Committee expenses will be covered through the annual budget of the USDA USFS.

8. Designated Federal Officer

A permanent Federal employee will be appointed in accordance with agency procedures and will serve as the Designated Federal Officer (DFO). The DFO will approve or call the advisory committee and subcommittees' meetings, prepare and approve all meeting agendas, attend all committee and subcommittee meetings, adjourn any meeting when the DFO determines adjournment to be in the public interest, and chair meetings when directed to do so by the official to whom the advisory committee reports.

The Forest Supervisor for the Tongass National Forest will serve as the DFO. The Deputy Forest Supervisor for the Tongass National Forest will serve as the Acting DFO.

9. Number and Frequency of Meetings

The Committee will meet as often as necessary to complete its work, perhaps as frequently as every month. A quorum of 10 members of the 15 member committee must be present to constitute an official meeting. The committee shall not hold any meetings except at the call of, or with the advance approval of, the DFO. Attendance may be in-person, by telephone, or by other electronic means.

10. Duration

Continuing.

The Committee will be up to 2 years in duration, but the majority of the work is expected to be accomplished between March 1, 2014 and December 30, 2014.

11. Termination

The Committee will expire 2 years after the date of filing unless prior to that date, it is renewed accordance with FACA, Section 14. The Committee will not meet or take any action without a valid current charter.

12. Membership and Designation

12a. The Committee will be fairly balanced in its membership in terms of the points of view represented and the functions to be performed. The Committee will be comprised of not more than 15 members. The members appointed to the Committee will be knowledgeable of ecological, social, and economic issues impacting Southeast Alaska, while providing a balanced and broad representation within the following interests:

i. Federally Recognized Tribes, Alaska Native Organizations and/or Alaska Native Corporation representatives;
ii. National or regional environmental and/or conservation organizations;
iii. Timber industry representatives

iv. Federal, State and local government representatives; and
v. Other commercial users, those holding land use permits or the public at large.

Committee members must have a demonstrated commitment to working collaboratively and finding solutions that meet multiple stakeholder values.

Committee advice and recommendations must be approved by consensus of the groups represented (2 out of 3 within each interest group) but not consensus of all participants.

One substitute (alternate) will be selected for each interest group.

Nominees will be sought through an open and public process that includes, but is not limited to, nominees submitted by Alaska Native Organizations, local and State governments, community based/non-governmental organizations, environmental and conservation groups, and individuals who represent the interests of the public served by National Forest System programs and land resources.

12b. Equal opportunity practices in accordance with USDA policies will be followed in all appointments to the Committee. To ensure that the recommendations of the Committee have taken into account the needs of the diverse groups served by USDA, membership will include to the extent possible, individuals with demonstrated ability to represent minorities, women and persons with disabilities.

12c. The USDA prohibits discrimination in all of its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, political beliefs, genetic information, reprisal, or because all or part of an individual's income is derived from any public assistance program.

12d. Of these members, one person who is recognized for his or her ability to lead a group in a fair and focused manner, and who has been briefed on the mission of this Committee will be designated by the Secretary to be the Chairperson. A co-Chairperson may be assigned, especially to facilitate his or her transition to become the Chairperson in the future.

12e. Ethics Statement

To maintain the highest levels of honesty, integrity and ethical conduct, no Committee or subcommittee member shall participate in any “specific party matters” (i.e., matters are narrowly focused and typically involve specific transactions between identified parties) such as a lease, license, permit, contract, claim, grant, agreement, or related litigation with the Department in which the member has a direct or indirect financial interest. This includes the requirement for Committee or Subcommittee members to immediately disclose to the DFO (for discussion with USDA’s Office of Ethics) any specific party matter in which the member’s immediate family, relatives, business partners or employer would be directly seeking

to financially benefit from the Committee's recommendations. Members of the Committee shall be required to disclose their direct or indirect interest in leases, licenses, permits, contracts, claims, grants, or agreements that involve lands or resources administered by the USFS, or in any litigation related thereto. For purposes of this paragraph, indirect interest includes holdings of a spouse or a dependent child.

All members will receive ethics training to identify and avoid any actions that would cause the public to question the integrity of the Committee's advice and recommendations. Members who are appointed as "Representatives" are not subject to Federal ethics laws because such appointment allows them to represent the point(s) of view of a particular group, business sector, or segment of the public.

Members appointed as "Special Government Employees" (SGEs) are considered intermittent Federal employees and are subject to Federal ethics laws. SGE's are appointed due to their personal knowledge, academic scholarship, background or expertise. No SGE may participate in any activity in which the member has a prohibited financial interest. Appointees who are SGEs are required to complete and submit a Confidential Financial Disclosure Report (OGE-450 form) and, upon request, USDA will assist SGEs in preparing these financial reports. To ensure the highest level of compliance with applicable ethical standards USDA will provide ethics training to SGEs on an annual basis. The provisions of these paragraphs are not meant to exhaustively cover all Federal ethics laws and do not affect any other statutory or regulatory obligations to which advisory committee members are subject.

13. Subcommittees

The USFS has the authority to create subcommittees. Subcommittees must report back to the parent committee, and must not provide advice or work products directly to the Agency.

14. Recordkeeping

The records of this Committee, formally and informally established subcommittees, or other subgroups of the committee, shall be handled in accordance with General Records Schedule 26, Item 2 or other approved agency records disposition schedule. These records shall be available for public inspection and copying, subject to the Freedom of Information Act, 5 U.S.C. 552.

15. Filing Date

FEB 10 2014

Appendix C: High-Value Fish Watersheds

Watershed Name	VCU #
Appleton Cove	2930
Fish Bay	2870
Irish Lakes	4290
Kadake Cr	4210
Mosman Inlet	4670
Bradfield River	5140
Nakwasina River	2990
Neka Bay	2010
Port Camden	4200
Rodman Bay	2920
Security Bay	4000
Sitkoh Bay	2430
Sitkoh Lake	2440
Situk River	3660
Sweetwater Lake	5730
Thoms Lake	4790

Appendix D: Map of Phase 1 Lands, T77 Watersheds, and TNC/Audubon Core Conservation Areas

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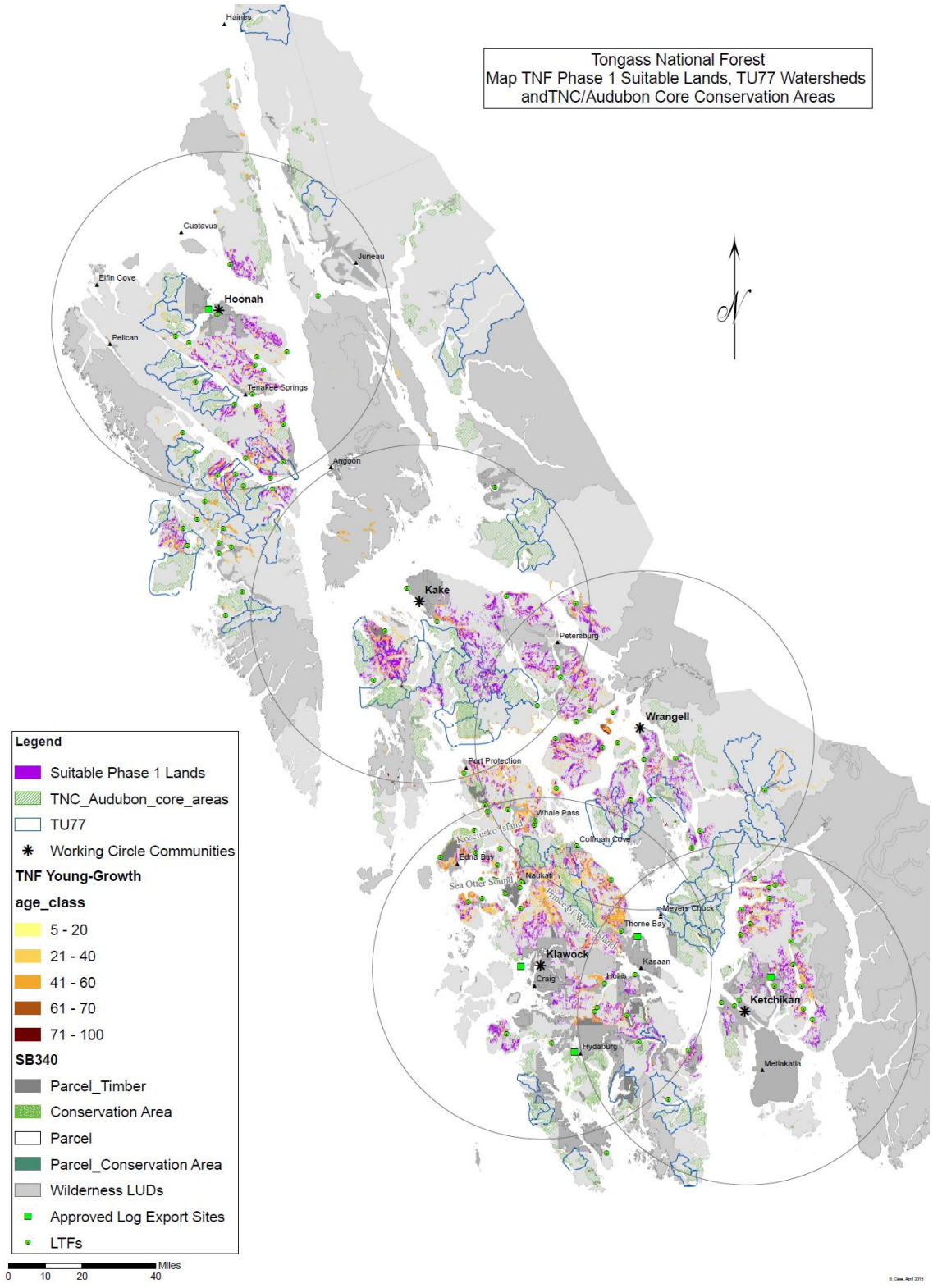

Appendix E: *Suggested Draft* Memorandum of Understanding Between Forest Collaborative Stakeholder Group Representatives And The U.S. Forest Service Tongass National Forest

Suggested Draft
Memorandum of Understanding
Between Forest Collaborative
Stakeholder Group Representatives
And The
U.S. Forest Service
Tongass National Forest

This Memorandum of Understanding (MOU) is hereby made and entered into by and between a Forest Collaborative (Collaborative) and the U.S. Forest Service, Tongass National Forest (TNF).

Whereas, the 16.7 million acre Tongass National Forest is managed for a variety of interests, with management directive to transition its timber program from old growth to predominantly young growth harvest;

Whereas, the 2016 Plan Amendment is being drafted—and will be implemented—in a time marked by transition. The Tongass Advisory Committee (TAC) has paved a path for multi-stakeholder collaboration in the region by reaching consensus within the sideboards of its 2014 Charter. This Charter was narrow in scope and did *not* charge the TAC with making overall recommendations in regard to fisheries, recreation, wildlife management, or tourism. This does not mean these values are overlooked. It is necessary, however, to recognize the full suite of challenges and opportunities associated with implementing a successful transition, and the range of forest values that will be positively affected by successful implementation;

Whereas, the Collaborative shares the following vision: *"Southeast Alaska is comprised of prosperous, resilient communities that have the opportunity to predictably use and benefit from the diversity of forest resources to achieve the cultural, social, economic, and ecological health of the region for current and future generations";*

Whereas, the consensus recommendations by the TAC for the Forest Plan Amendment and transition more generally represent an unprecedented opportunity that must be acted upon more comprehensively and as soon as possible;

Whereas, innovative collaboration can provide the U.S. Forest Service with better information, a more comprehensive and science-based planning process, better planning integration, conflict mitigation, improved fact-finding, increased social capitol, more effective implementation, enhanced environmental stewardship, and reduced litigation. The Council on Environmental

Quality (CEQ) 2007 publication, "Collaboration in NEPA: A Handbook for NEPA Practitioners," provides instructive guidance for collaboration throughout the NEPA process;

Whereas, transition implementation can and should occur in an ecologically sustainable, resilient manner that is economically and socially viable. This document describes the intentions of the U.S. Forest Service and members of the Collaborative as they work together towards transition implementation and monitoring on the Forest;

Whereas, members of the Collaborative have entered into an agreement (the Collaborative Stakeholder Charter) describing their mutual participation in a collaborative group with the goal of reaching consensus recommendations to guide implementation and monitoring of the Tongass transition;

Whereas, *(mediation and staffing clause)*;

Whereas, a great deal of effort has been invested in accelerating the transition on the ground to meet the Secretary's directive, via innovative planning and stakeholder deliberation. The TAC's recommendations represent a foundational document for comprehensive transition that genuinely supports forest-dependent communities adjacent to the Tongass. The U.S. Forest Service recognizes the importance of the TAC's deliberative work to guide the transition and will consider the recommendations document, finalized December 2015, along with all other public comments and recommendations in a public process before reaching a particular decision. TAC members and other stakeholders feel a sense of responsibility to steward the values associated with the transition well beyond the life of the 2016 Amendment planning process;

Whereas, implementation of the transition is embodied by the following goals: 1) to actively model the types of sharing and feedback required by the 2012 Planning Rule; 2) to improve and complement monitoring at project and Forest levels; 3) to facilitate collaboration in low-capacity, forest-dependent communities; and 4) to steward the values associated with the TAC's transition recommendations.

Now therefore, the U.S. Forest Service and members of the Collaborative agree to work together towards appropriate and timely implementation and monitoring on the Tongass transition;

I. PURPOSE

The purpose of this MOU is to document a framework of collaboration by all parties involved and interested in the implementation and monitoring of the Tongass transition directive, and the cooperative relationship among the parties to complete a successful transition.

The MOU defines the relationship between the U.S. Forest Service and the Collaborative. These Parties, along with the public at large, will work together at multiple stages prior to, during, and following the NEPA process to actively implement and monitor transition-related

management actions, subject to/consistent with applicable federal laws, regulations, land management plans, and other management direction.

II. STATEMENT OF MUTUAL BENEFIT AND INTERESTS

The U.S. Forest Service and the Collaborative enter this MOU to learn and work together to steward the values associated with the TAC's transition recommendations. The Parties expect that implementation, monitoring, and active adaptive management of the TAC's recommendations will support prosperity and resiliency in forest-dependent communities adjacent to the Tongass National Forest.

In consideration of the above premises, the parties agree as follows:

III. THE COLLABORATIVE SHALL

a. Steward the values associated with the TAC's transition recommendations, using this focus as its north star when determining where to direct its resources;
b. Develop agreement-based recommendations that are intended to inform and express diverse support for transition-related implementation and monitoring activities;
c. Provide input to the U.S. Forest Service in a timely manner that matches the needs of an efficient NEPA and implementation timeline;
d. Maintain communication with the U.S. Forest Service in order to track ongoing processes and upcoming scoping so that the group can provide timely input;
e. Maintain capacity to discuss, evaluate, and support implementation and monitoring of innovative planning, project planning and implementation, administration, science integration, and adaptive management strategies;
f. Support agreement-based recommendations in the face of external challenges;
g. Develop, share, and apply scientific and technical information intended to significantly bolster adaptive transition implementation;

IV. THE U.S. FOREST SERVICE SHALL

a. Work directly with parties at all phases of the NEPA process, seeking their input and agreement on: the purpose and need statement, alternatives, collection and use of data, impact analysis, development of a preferred alternative, and/or recommendations regarding mitigation of environmental impacts (CEQ Handbook, p. 13);
b. Work directly with parties to develop and/or amend optional plan components, including the TNF Monitoring Plan pursuant to the 2012 Planning Rule;
c. Strive to accommodate the agreement-based outcomes and products of the collaborative process within the Collaborative, recognizing that translation of such agreement greatly enhances chances for success, and reduces the risk of conflict;
d. Communicate with the Collaborative and the general public the Agency decisions and management direction that are pending, both before and after development of associated timelines, as soon as possible;

e. Line and/or Staff Officers or their designee will participate in Collaborative meetings, consistent with requirements in federal law;

V. IT IS MUTALLY UNDERSTOOD AND AGREED BY AND BETWEEN THE PARTIES THAT

a. The Collaborative is inclusive; new members may join at any time, and the public at large has the same rights and opportunities for access to information and input into the process whether a member or not of the Collaborative;
b. This MOU does not grant cooperating agency status to any member of the Collaborative;
c. The U.S. Forest Service and the Collaborative will work together through all phases of the NEPA process potentially including the framing of the issues, the development of a range of reasonable alternatives, the analysis of impacts, and the identification of the preferred alternative—up to, not including, the agency's final decisions made by the relevant Line Officer (CEQ Handbook, p. 13);
d. The U.S. Forest Service and the Collaborative will work together to develop, discuss, evaluate, and implement innovative planning, project preparation, treatment, science integration, monitoring and adaptive management strategies;
e. The U.S. Forest Service and the Collaborative will work together to identify strategies for implementation, monitoring, and adaptive management that are efficient and effective, toward prosperous and resilient local communities and a more socially, ecologically, and economically viable transition;
f. The U.S. Forest Service and the Collaborative will work together to develop a regular process and means to keep the Alaskan Congressional Delegation, appropriate state officials, and high-level Forest Service or USDA officials informed of activities that occur under this MOU;
g. The U.S. Forest Service and the Collaborative will work together to identify efficiencies in utilization and contracting strategies, grants and agreements, and use of volunteers. This is exclusive of the contracting design, awarding, and administration processes;
h. All documents developed and submitted to the U.S. Forest Service from the Collaborative will become public documents;
i. Once the U.S. Forest Service formally initiates the NEPA process, specific timelines for advancing that analysis will be established. The Collaborative will provide input to the U.S. Forest Service in accordance to these timelines in order to be considered;

(this section also includes technical components to be developed by Grants and Agreements; see similar Memorandums for model)

Appendix F: Outline for Socioeconomic Analyses

The recommended analyses address the Forest Plan Amendment and transition strategy, including old and young growth timber sales, co-intent projects, restoration and stewardship projects, workforce and business capacity development efforts, and other key transition components. The recommended plan is nested geographically, with measures by borough/census area (correlated with ranger districts and working circles as possible) and Forest-wide. [12]

A range of types, scales, and levels of participation in monitoring are possible (see Figure1). Most notably, the Agency's 2016 monitoring plan, developed pursuant to the 2012 planning rule, presents a robust approach to implementation monitoring (i.e., did we do what we said we were going to do?). [13, 14] The TAC's recommendations supplement ongoing implementation monitoring with verification/validation and effectiveness monitoring, which ask if (1) completed actions led to expected outcomes; and (2) if completed actions are contributing to objectives. In order to help our communities thrive, monitoring must measure outcomes as well as outputs.

Figure 1: Types, Scales, and Levels of Participation in Monitoring[15]

		Focus
Types	Biophysical; economic; social/cultural; legal/administrative	Input; output; outcome
Scales	Project; program; community, island, or ranger district; region; state/country	Implementation; verification/validation; effectiveness
Participation	Single-party; third-party; multiparty	

[12] For census area/borough boundaries, visit the Alaska Department of Labor and workforce Development Research and Analysis, available at: http://labor.alaska.gov/research/census/maps.htm

[13] Tongass National Forest Draft Plan Monitoring Program, available at: http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprd3827408.pdf.

[14] Monitoring Requirements under the 2012 Planning Rule are listed on the Tongass National Forest Monitoring Reports page, available at: http://www.fs.usda.gov/detail/tongass/landmanagement/planning/. The full text of the 2012 Planning Rule is available at: http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5362536.pdf.

[15] Adapted from Multiparty Monitoring for Sustainable Natural Resource Management, available through the University of Oregon Ecosystem Workforce Program at: http://ewp.uoregon.edu/resources/community-guidebook/.

The recommended analyses should have four (or more) thematic emphases and eight (or more) questions; Figure 2 outlines the monitoring questions and measures.

Figure 2: Monitoring questions and measures [16]

Theme	*Question addressed*	*Measures/metrics*	*Scale reported*
A. Context and trends	a. What are the socioeconomic conditions and context in the borough/census area in which the transition is being implemented?	Employment by sector	Census area or borough
		Unemployment	Census area or borough
		Poverty	Census area or borough
		Number of students eligible for free and reduced lunch	Census area or borough and school
		School enrollment	Census area or borough
		Median age	Census area or borough
B. Employment and economic impacts	a. What are the employment effects in the communities around National Forests from co-intent projects, restoration projects, and timber sales?	Private sector jobs (direct, indirect, induced) associated with: • Restoration service contracts and stewardship • Timber sale harvesting and processing and transport of wood products	Ranger District or zone and Forest-wide
	b. What are the personal income effects in the communities around National Forests from co-intent projects, restoration projects, and timber sales?	Private sector labor income (direct, indirect, induced) associated with: • Restoration service contracts and stewardship • Timber sale harvesting and processing and transport of wood products	Ranger District or zone and Forest-wide
	c. What is the	Business output (direct,	Ranger District or

[16] Adapted from Ecosystem Workforce Program Working Paper Number 52: Socioeconomic Monitoring Plan for the U.S. Forest Service's Eastside Restoration Efforts, available at: http://ewp.uoregon.edu/sites/ewp.uoregon.edu/files/WP_52.pdf

	economic activity resulting, in the communities around National Forests from co-intent projects, restoration projects, and timber sales?	indirect, and induced) associated with: • Restoration service contracts and stewardship • Timber sale harvesting and processing and transport of wood products	zone and Forest-wide
C. Business health and impacts	a. What are the effects of transition implementation on the health of wood products *businesses*?	Businesses reporting good health as indicated by: • Workforce maintained or hired	Ranger District or zone and Forest-wide
	b. What are the effects of transition implementation on the health of the regional wood products *industry*?	Proportion of business type and workforce maintained or hired	Ranger District or zone and region-wide
	c. How much co-intent work/sales, restoration work, and timber sales are local and regional businesses capturing?	• Percent of service contracts and timber sales captured by businesses local to a Forest annually • Total value of contracts and timber sales captured locally annually • Primary types of work captured locally/not captured locally	Ranger District or zone and region-wide
D. Collaborative capacity	a. What is the capacity of collaborative groups to undertake an accelerated transition via co-intent projects in both suitable and non-suitable LUDs?	Guided self-evaluation rankings for: • Spatial scales at which they are working • Timelines at which they are working • Levels of ecological/social complexity of projects • Level of trust	Ranger District or zone, across Districts/zones (by group), and region-wide
		Number of matching funds and in-kind contributions from non-Agency partners for project planning, implementation, and monitoring	Ranger District or zone, across Districts/zones (by project), and region-wide

Acronyms and Abbreviations

Agency	United States Forest Service
CMAI	Culmination of Mean Annual Increment
Committee	Tongass Advisory Committee
DEIS	Draft Environmental Impact Statement
Department	United States Department of Agriculture
FEIS	Final Environmental Impact Statement
Forest	Tongass National Forest
Forest Plan	Tongass Land & Resource Management Plan
GIS	Geographic Information System
IDT	Interdisciplinary Team
IRM	Integrated Resource Management
LUD	Land Use Designation
MOU	Memorandum of Understanding
NEPA	National Environmental Policy Act
NGO	Non-governmental Organization
PCT	Pre-commercial Thinning
PTSQ	Projected Timber Sale Quantity
RLT	Regional Leadership Team
ROD	Record of Decision
RMA	Riparian Management Area
S&Gs	Standards and Guidelines
SIO	Scenery Integrity Objective
TAC	Tongass Advisory Committee
TLT	Tongass Leadership Team
Tongass	Tongass National Forest
TTRA	Tongass Timber Reform Act
USDA	United States Department of Agriculture
USFS	United States Forest Service
WO	Washington Office

About Meridian Institute

Meridian Institute is a not-for-profit organization whose mission is to help people solve problems, make informed decisions, and find solutions to some of society's most complex and controversial issues. Meridian's mission is accomplished through applying collaborative problem-solving approaches including facilitation, mediation, and other strategic consultation services. Meridian works at the local, national and international levels and focuses on a wide range of issues related to natural resources and environment, science and technology, agriculture and food security, sustainability, global stability and health. For more information, please visit **www.merid.org**.

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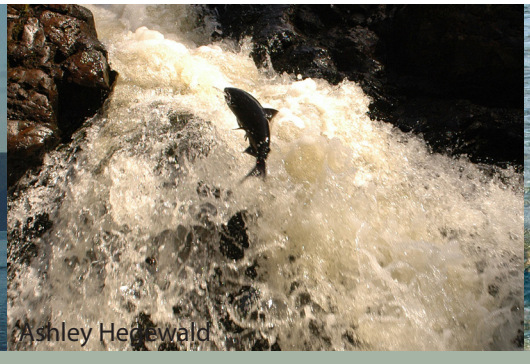
THE TONGASS 77

Protecting Southeast Alaska's Best Salmon Watersheds

At nearly 17 million acres, the Tongass National Forest in Southeast Alaska is our country's largest national forest. This magnificent landscape of western hemlock, Sitka spruce, western red cedar and yellow cedar is part of the world's largest remaining intact temperate rainforest. The Tongass comprises thousands of mist-covered islands, deep fjords, tidewater glaciers and soggy muskegs that host some of the rarest ecosystems on the planet. It is ideal habitat for a vast array of plant and animal species—including all five species of North American Pacific salmon, steelhead and resident trout, brown and black bear, Sitka black-tailed deer, bald eagles, and wolves, among many others. The Tongass includes more than 15,700 miles of clean, undammed streams and 4,100 lakes and ponds that provide optimal spawning and rearing conditions for the region's abundant wild salmon and trout.

Each year as hundreds of millions of wild salmon return to Tongass streams to spawn and die, they bring nutrients from the North Pacific Ocean to the forest. Enriched by this annual salmon return, the Tongass literally is a



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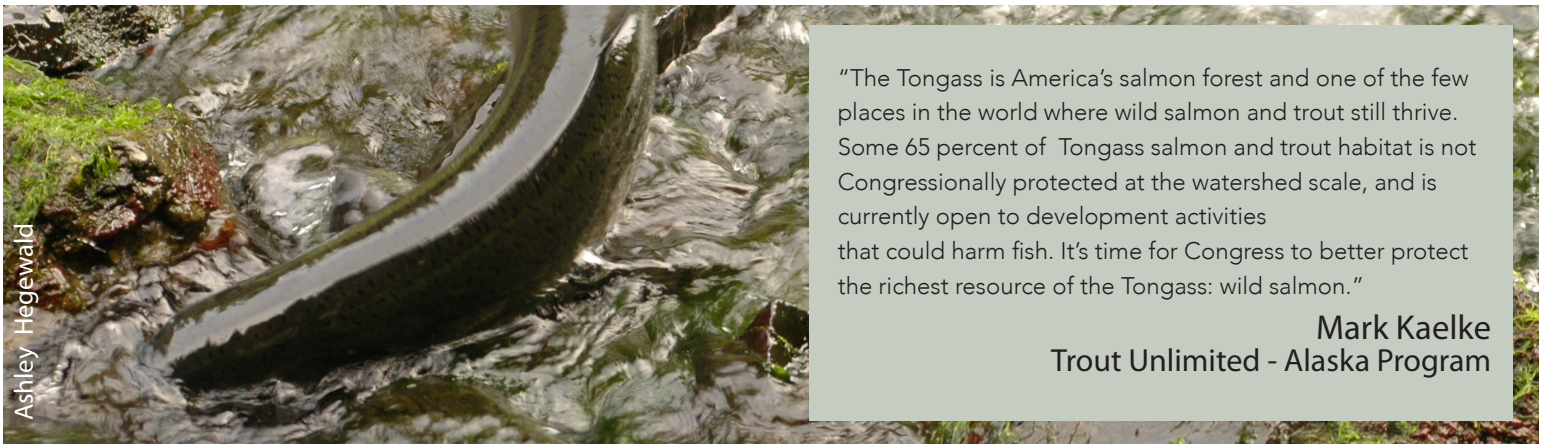
AmericanSalmonForest.org



"The Tongass is America's salmon forest and one of the few places in the world where wild salmon and trout still thrive. Some 65 percent of Tongass salmon and trout habitat is not Congressionally protected at the watershed scale, and is currently open to development activities that could harm fish. It's time for Congress to better protect the richest resource of the Tongass: wild salmon."

Mark Kaelke
Trout Unlimited - Alaska Program

"salmon forest" with unique ecosystems found nowhere else on Earth. Despite its stature as an internationally significant forest, 65-percent of the Tongass' salmon and trout habitat is not protected at the watershed scale. This means millions of acres of temperate Alaska rainforest are open to development activities that could permanently harm important fish and wildlife habitat.

Culture and Economics

Salmon and trout not only sustain the plant and animal communities of the Tongass, but they also serve as the foundation for local cultures and communities. Virtually all of the roughly 75,000 people who call Southeast Alaska home depend on Tongass salmon and trout for income and employment, for cultural and ceremonial purposes, or for nutrition and recreation. For the three coastal tribes that have populated the region for many thousands of years, salmon underpin their traditional gathering practices and form a major part of their culture.

Salmon fishing—including commercial, sport and subsistence fishing—provides nearly 11-percent of the region's jobs and contributes $1 billion annually to the local economy. For each of the past three years, Southeast Alaska has produced the largest salmon harvest in the state, with fishermen hauling in up to 100 million salmon worth more than $200 million a year. Tongass salmon comprise 79-percent of the annual salmon harvest from Southeast Alaska, 28-percent of the overall salmon catch for all of Alaska, and 25-percent of all salmon harvested from the North American Pacific coast—including all of Alaska, Canada, Washington, Oregon and California.

Threats

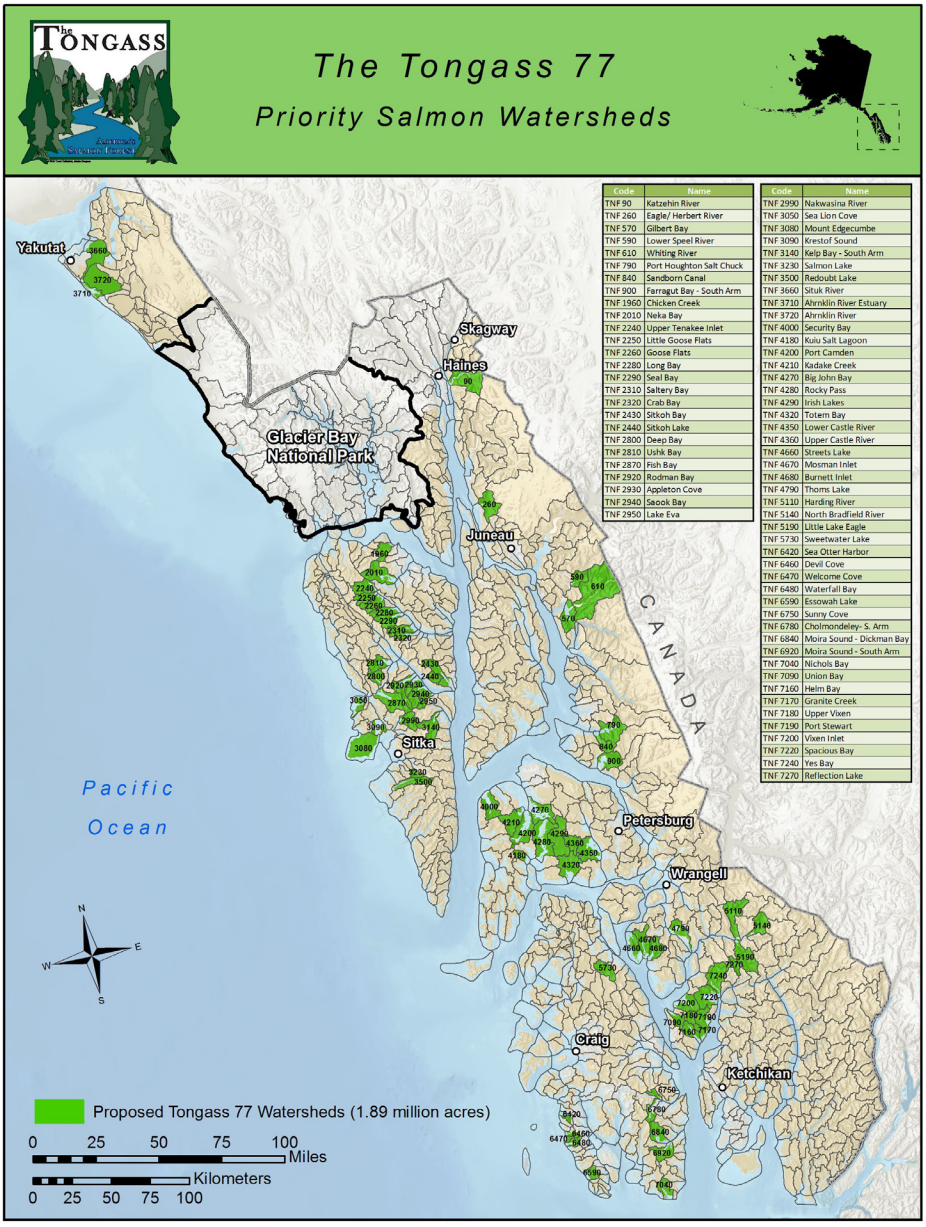
While most salmon and trout populations in the Tongass are healthy and abundant, their future is uncertain. Industrial-scale logging and road building, new mining developments, dozens of hydroelectric dam projects, and various proposals to privatize large swathes of the most productive and valuable portions of the Tongass threaten permanent damage to the region's most valuable resource: salmon. While 35-percent of Tongass salmon and trout habitat is protected at the watershed scale, many of the most important salmon streams remain vulnerable to industrial development that can cause serious harm to the long-term

productivity of fish habitat. Climate change impacts and reduced funding for research and restoration programs also are becoming more common.

The troubled history of salmon in the Pacific Northwest and California, where wild salmon runs once rivaled Alaska's, foreshadows what could occur in Southeast Alaska unless lawmakers, government agencies and the public act to make habitat conservation and restoration top priorities. In the Tongass, we still have the opportunity to ensure salmon and trout, and the people who depend on them, enjoy a healthier and more stable future.

Solution

Salmon and trout—and the communities, cultures and economies they sustain—require clean, healthy watersheds for spawning, rearing and migrating. Researchers from the Alaska offices of the Audubon Society, The Nature Conservancy and Trout Unlimited used state-of-the-art GIS and conservation planning software to identify the "best of the best" from the thousands of salmon and trout watersheds on the Tongass that currently lack watershed-scale protection. After consulting with federal and state biologists and various community and business stakeholder groups, the list was narrowed down to 77 high-value watersheds (since reduced to 73 by intervening legislation) comprising 1.9 million acres that form the backbone of Southeast Alaska's salmon fishery and the local economy. Based on the outstanding fish habitat in these watersheds and their contributions to local communities and economies, the highest and best use of the "Tongass 77" is for salmon and trout production.



Code	Name
TNF 90	Katzehin River
TNF 260	Eagle/ Herbert River
TNF 570	Gilbert Bay
TNF 590	Lower Speel River
TNF 610	Whiting River
TNF 790	Port Houghton Salt Chuck
TNF 840	Sandborn Canal
TNF 900	Farragut Bay - South Arm
TNF 1960	Chicken Creek
TNF 2010	Neka Bay
TNF 2240	Upper Tenakee Inlet
TNF 2250	Little Goose Flats
TNF 2260	Goose Flats
TNF 2280	Long Bay
TNF 2290	Seal Bay
TNF 2310	Saltery Bay
TNF 2320	Crab Bay
TNF 2430	Sitkoh Bay
TNF 2440	Sitkoh Lake
TNF 2800	Deep Bay
TNF 2810	Ushk Bay
TNF 2870	Fish Bay
TNF 2920	Rodman Bay
TNF 2930	Appleton Cove
TNF 2940	Sasok Bay
TNF 2950	Lake Eva

Code	Name
TNF 2990	Nakwasina River
TNF 3050	Sea Lion Cove
TNF 3080	Mount Edgecumbe
TNF 3090	Krestof Sound
TNF 3140	Kelp Bay - South Arm
TNF 3230	Salmon Lake
TNF 3500	Redoubt Lake
TNF 3660	Situk River
TNF 3710	Ahrnklin River Estuary
TNF 3720	Ahrnklin River
TNF 4000	Security Bay
TNF 4180	Kulu Salt Lagoon
TNF 4200	Port Camden
TNF 4210	Kadake Creek
TNF 4270	Big John Bay
TNF 4280	Rocky Pass
TNF 4290	Irish Lakes
TNF 4320	Totem Bay
TNF 4350	Lower Castle River
TNF 4360	Upper Castle River
TNF 4660	Streets Lake
TNF 4670	Mosman Inlet
TNF 4680	Burnett Inlet
TNF 4790	Thoms Lake
TNF 5110	Harding River
TNF 5140	North Bradfield River
TNF 5190	Little Lake Eagle
TNF 5730	Sweetwater Lake
TNF 6420	Sea Otter Harbor
TNF 6460	Devil Cove
TNF 6470	Welcome Cove
TNF 6480	Waterfall Bay
TNF 6590	Essowah Lake
TNF 6750	Sunny Cove
TNF 6780	Cholmondeley- S. Arm
TNF 6840	Moira Sound - Dickman Bay
TNF 6920	Moira Sound - South Arm
TNF 7040	Nichols Bay
TNF 7090	Union Bay
TNF 7160	Helm Bay
TNF 7170	Granite Creek
TNF 7180	Upper Vixen
TNF 7190	Port Stewart
TNF 7200	Vixen Inlet
TNF 7220	Spacious Bay
TNF 7240	Yes Bay
TNF 7270	Reflection Lake

Federal legislation to permanently protect the Tongass 77 is necessary to ensure the long-term productivity of these important salmon watersheds. Maintaining natural salmon production and the health and function of fish and wildlife habitat should be the top management priorities.


Mark Kaelke

Protecting Southeast Alaska's Best Salmon Watersheds

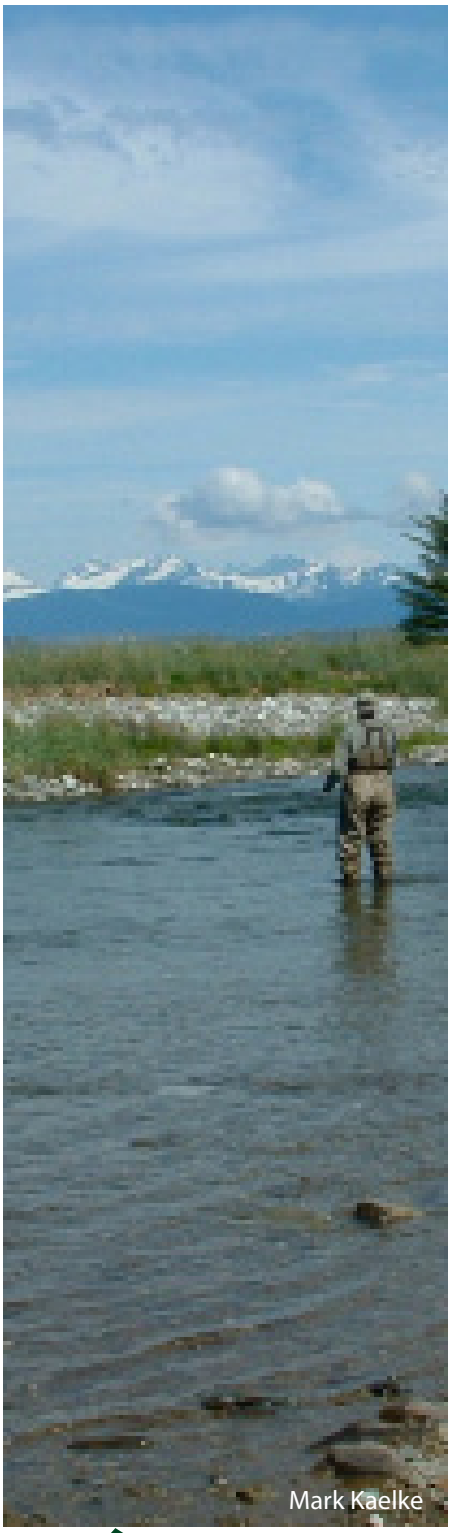
TROUT UNLIMITED

Additionally, by prohibiting commercial logging, new road building and new mining developments within the Tongass 77, we can help ensure Southeast Alaska's abundant wild salmon return for generations to come and continue to fuel the region's communities and economy.

Scientific & Public Support

Prevailing scientific and public opinion support protecting the Tongass 77. Trout Unlimited's Alaska Program has compiled an 88-page literature review that documents the ever-expanding rationale for why conserving entire salmon watersheds from ridge tops to river mouths makes sound scientific sense. The report shows that full-scale watershed protection is the best way to preserve both habitat diversity and natural processes so critical to salmon and trout.

The Nature Conservancy polled Alaskans and found a majority of them overwhelmingly support policies that protect salmon habitat across Alaska. Ninety-six percent of Alaskans surveyed said salmon are essential to the Alaskan way of life, and 97-percent said salmon are an important part of the Alaskan economy. Statewide, 89-percent of Alaskans stated that even in tough economic times it is important to maintain funding for salmon conservation. More at www.americansalmonforest.org/science.


Mark Kaelke

YOU CAN HELP

Whether you fish for salmon and trout, eat them or just like knowing they're out there, you can be part of the solution.

CONTACT YOUR LEGISLATOR.

✓ Congress needs to know you support "The Tongass 77." Please sign our open letter to Congress at AmericanSalmonForest.org/sign-on

TROUT UNLIMITED

Alaska Program

We work to conserve, protect and restore wild salmon and trout populations throughout Alaska. TU's vision for the Tongass National Forest includes permanent conservation designations for high-value salmon and trout watersheds, as well as the implementation of a comprehensive plan for restoring fish passage and impacted watersheds throughout the region. These actions will sustain and enrich the vital economic and social contributions of salmon and trout to Southeast Alaska.

Contact Us

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