Conservation Economics Institute

Tongass Roadless Rule DEIS Economic Review

December 16, 2019

Alaska Roadless Rule,
USDA Forest Service, Alaska Region
Ecosystem Planning and Budget Staff,
P.O. Box 21628, Juneau, Alaska 99802– 1628.

FROM: Evan Hjerpe, Ph.D., Forest Economist

RE: Alaska Roadless Rule Draft Environmental Impact Statement (DEIS) Review of Economics

To whom it concerns,

I am submitting the following economic comments on the Tongass Roadless Rule DEIS. I am a forest economist with over a decade of professional experience researching the economic values of forest management in the U.S. and internationally. I have a Ph.D. in forest management and economics from Northern Arizona University. I spent five years working in the Tongass National Forest, researching economic forestry solutions that benefited southeast Alaskan communities. With the Draft Environmental Impact Statement (DEIS) to exempt the Tongass National Forest from the Roadless Rule, I am compelled to illustrate the shortfalls in economic analysis contained in the DEIS. My experience in forest economics and on the Tongass makes me highly qualified for reviewing the economic components of the DEIS.

In these comments, I detail how all economic valuations and trends associated with Tongass timber production and roadless protections clearly indicate that both national and Southeast Alaskan residents will incur greater benefits by keeping the Roadless Rule in place in Alaska. In fact, removing roadless protections from the Tongass will result in tremendous costs and damages to other economic sectors, national taxpayers, ecosystem services, and biodiversity. Because of the obvious economic perils and government waste that would result from removing Tongass roadless protections, the only reasonable alternative is the No Action alternative.

The Tongass Roadless Rule DEIS, released on October 17, 2019, is lacking credible economic analysis and falls well short of appropriate NEPA economic requirements. In the DEIS, USDA has ignored the best available economic science, which clearly illustrates that from almost every economic angle, the U.S. and southeast Alaskans are better off keeping the Roadless Rule intact. Not only has USDA ignored the best available science, they also did not provide any economic analysis to show how exempting the Roadless Rule on the Tongass would help Alaska or the nation. The disregard for incorporating the best available science, combined with providing no supporting economic analysis, undermines the validity of

appropriate NEPA analysis. These economic issues were flagged in detailed scoping comments,[1] yet were not addressed in the DEIS.

The overarching economic theme presented in the DEIS is that Tongass roadless timber production can occur in a vacuum without damaging the primary economic drivers of the region or the ecological integrity of the Tongass, and without additional costs to the agency. This is perhaps the biggest flaw of the NEPA analysis and illustrates a poor understanding of real-world economics. With numerous deficiencies, USDA's economic analysis in the DEIS does not accord with economic theory and does not meet the acceptable standard for economic analysis on public lands as mandated by NEPA, the NFMA, and appropriate forest planning. With such a paucity of credible economic analysis, this DEIS and its management direction, is fatally flawed and must be withdrawn.

The major deficiencies regarding economics in the DEIS include:

- USDA did not validate the State of Alaska's claims of economic harm from the Roadless Rule, which are meritless and unsupported.
- USDA's purpose and need are irrational, and they have provided no logical rationale, economic or otherwise, to justify the proposed rule.
- USDA's distributional effects analysis shows the proposed rule will result in zero increases in regional employment, output, or income. USDA has thus verified that there is no logical rationale for the proposed rule, as the entire rationale is predicated on providing further economic development to Southeast Alaska.
- The Cost-Benefit Assessment required for this rulemaking is does not pass scientific or legal muster and does not accord with standard economic theory.
- USDA included timber harvesting costs in Tongass IRAs that are erroneously projected to decrease under the proposed rule, but inexplicably did not include any increased road construction, decommissioning, or maintenance costs.
- In the Cost-Benefit assessment, USDA has mistaken distributional effects of changes in industry revenues for costs and benefits to be used in economic efficiency analysis.
- USDA has not quantified any costs or benefits to the US Forest Service (USFS) or society at large, despite numerous cost increases that will result from the proposed rule.
- USDA's net present valuation (NPV) of costs and benefits appears to be wildly inaccurate.
- USDA has provided almost no supporting economic data to support their claims of harvest cost savings, nor any supporting engineering or economic analysis to project road needs and costs for timber production in Tongass IRAs.
- USDA has omitted most of the Tongass economics literature illustrating the severe economic inefficiency of Tongass timber production and peer-reviewed research illustrating conservation benefits for protecting Tongass old growth.
- When including increased road costs and lost conservation benefits, credible cost-benefit analysis illustrates that the proposed rule will result in losses ranging from $26 million to $48 million, at a minimum.
- USDA has not included synthesized economic research showing that the Tongass timber program has an average cost-benefit ratio of 25. That is, for every $1 million received by the

[1] See Tongass Roadless Rule scoping comments submitted by Dr. Evan Hjerpe on 10/15/18.

U.S. Treasury for stumpage fees, U.S. taxpayers pay $25 million in federal agency costs to subsidize timber harvests.

- In the Agency and Regulatory Costs section, USDA has failed to quantify a single cost to the agency, despite many costs to choose from for analysis.
- USDA did not provide an ecosystem services perspective of the proposed rule, despite its current prominence as the USFS's dominant management paradigm.

1. Introduction

The Tongass National Forest (hereafter, the Tongass) is renowned for its pristine old growth rainforests. Tongass roadless forests provide the iconic backdrop to numerous cruise ships that show tourists the Inside Passage. Tongass roadless forests also provide habitat for spawning salmon and directly support one of the biggest economic drivers in the region---commercial fishing. By providing the economic goods and services required to produce the primary regional economic activities of tourism, commercial and sport fishing, and subsistence, Tongass roadless forests are critical to the provision of widespread economic benefits and impacts to Southeast Alaska. Nationally, Tongass roadless forests are also a major source of economic benefit through carbon sequestration and by providing immense passive use value in the form or option, bequest, and existence values held for scarce and pristine coastal temperate old growth rainforests.

Opening Tongass roadless areas to development will result in tremendous economic losses for the American public and residents of Southeast Alaska. Removing roadless protections in the Tongass is certainly NOT in the best interest of Alaskan residents, nor is it in the best interest of national residents. Jeopardizing such valuable landscapes with irreversible environmental damages is extremely short-sighted and will result in damages to every industry except the timber industry. Exempting the Tongass from the Roadless Rule will also perpetuate a corporate welfare program where taxpayers are forced to subsidize a damaging industry to the tune of $30 million a year. The proposed Rule in the DEIS is both fiscally and ecologically irresponsible.

Inventoried Roadless Areas (IRAs) recognized by the 2001 Roadless Rule provide for numerous economic benefits and impacts to adjacent communities and the nation. By keeping roadless areas undeveloped, nature is allowed to provide high quality ecosystem services, or benefits to mankind. The most notable and obvious ecosystem services protected by the Roadless Rule center on water quality and supply, biodiversity, and carbon storage. Roadless forests in the U.S. contain many headwaters, pristine forests, and critical fish and wildlife habitat. While the majority of ecosystem services produced by roadless forests are not traded in financial markets, there are non-timber forest products such as mushrooms, berries, firewood, and wild game and fish that are marketed or act as monetary supplements for grocery budgets. This is especially true of economies that include a high rate of subsistence activities such as Southeast Alaska.

Much like Wilderness areas and other protected lands, roadless forests are a critical component of our national conservation lands. This reserve of conservation lands is akin to a bank account of nature that continually collects interest and becomes more valuable into the future. Natural areas are rapidly diminishing world-wide and in the U.S. As natural landscapes, and their associated natural disturbance

regimes, continue to shrink and scarcity increases, remaining natural areas increase in value.[2] These natural areas hold tremendous option value for the future, including potential medicinal cures, refuge for climate change-affected species, and chemical compounds for agriculture and manufacturing. Eliminating the protection for roadless areas could eliminate future options associated with these natural areas.

Nationally, roadless areas are important for regional economic benefits and impacts. Recent research[3] illustrated the overall economic value of Lower 48 roadless areas. Results show over 11 million annual visits to roadless areas in the Lower 48, that provided for $500 million of economic benefit, or personal value to recreationists, and millions of dollars in regional economic impact from outdoor recreationists who purchase goods and services in the small towns adjacent to roadless areas. Roadless areas are also highly regarded for their passive use values such as existence, option, and bequest values, estimated at $8 billion annually in the continental U.S.[4]

A major reason for implementing the original Roadless Rule was to help prevent wasteful government spending, saying that, "budget constraints prevent the Forest Service from adequately maintaining the existing road system."[5] The original Roadless Rule also indicated that a national rule was necessary because the Forest Service has "the responsibility to consider the 'whole picture' regarding the management of the National Forest System, including inventoried roadless areas" and "[l]ocal land management planning efforts may not always recognize the national significance of inventoried roadless areas and the values they represent in an increasingly developed landscape."[6]

This is very true of the Tongass, where local land management has failed to recognize, or account for, the national significance of Tongass roadless areas and has shown disregard for the "whole picture" as related to total economic benefits provided. Likewise, Alaska has a $68 million Forest Service road maintenance backlog; nationally the USFS road maintenance backlog is estimated at $3.2 billion.[7] With such an extensive backlog of road needs, why is USDA attempting to increase this deficit? Where is the collective national taxpayer voice in this process?

Given that roadless areas are important for wildlife, water quality, and recreation, there is a tremendous need to have the economic values of roadless areas on the Tongass and elsewhere documented in the public record during the NEPA process. There are over nine million acres of IRAs in the Tongass. These roadless areas gained protection under the 2001 Roadless Rule but would be exempted and opened up for extractive development under the proposed rule. Opening Tongass roadless areas to timber harvest will result in significant environmental consequences---effects that must be, but are not, disclosed in the DEIS.

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[2] Holmes, T. P., Bowker, J. M., Englin, J., Hjerpe, E., Loomis, J. B., Phillips, S., & Richardson, R. (2015). A synthesis of the economic values of wilderness. *Journal of Forestry*, *114*(3), 320-328.

[3] Hjerpe, E. and G. Aldrich. 2018. Economic values and contributions of roadless areas. A Conservation Economics Institute Report. 25p. Available at: https://www.researchgate.net/publication/336444790_Economic_Values_and_Contributions_of_Roadless_Areas

[4] *Ibid.*

[5] 36 C.F.R. §§ 294 (2001), Federal Register pp. 3245-3246.

[6] *Ibid*.

[7] USFS responses to Rep. Mike Quigley.

The best way to visualize the economic value of roadless forests is to examine landscapes that have been developed for timber production or mining. That is, what will be lost when roadless forests lose their protection? What is the economic cost associated with land degradation and pollution? These are the costs that need to be clearly assessed in the EIS process but are lacking in the DEIS. What are the benefits of keeping roadless protections, such as avoided costs of pollution and resource damages? A full assessment of the trade-offs associated with this rulemaking needs to be clearly delineated. The current DEIS is insufficient and must be withdrawn and redone.

2. There is No Purpose and Need for a Tongass Roadless Exemption

USDA and the State of Alaska have not come up with any rational purpose and need for a new rulemaking process. Throughout the DEIS, USDA indicates that the impetus for this rulemaking comes from a petition from the State of Alaska. The State of Alaska (SOA)'s petition (DEIS: Appendix A) to USDA for this rulemaking claims the 2001 Roadless Rule has resulted in "extensive damage… to the economic and social fabric of Southeast Alaska…" The Petition also states that a roadless exemption is needed for the socioeconomic well-being of Tongass residents. However, the State of Alaska provides zero evidence of economic damages coming from the 2001 Roadless Rule, and zero evidence that exempting the Tongass from the Roadless Rule will improve the socioeconomic well-being of Tongass residents. In fact, there is overwhelming economic evidence to the contrary. USDA apparently did not verify the economic rationale from the State's petition, nor did they provide any logical economic reasoning for the preferred alternative in the DEIS. In lieu of evidence-based research from the State of Alaska or USDA, I will first illustrate why the purpose and need for this rulemaking are faulty and then provide economic explanations of the trade-offs associated with exempting the Tongass from the Roadless Rule.

2.1 The Rationale from the State of Alaska's Petition is Inaccurate

The rationale throughout SOA's petition is crystal clear: they are asking the USDA "…to support a diverse and robust forest products sector in Southeast Alaska." It is also crystal clear that the SOA wants a forest products sector based strictly on clearcutting old growth forests. Not only does the SOA's petition request USDA to revise the Roadless Rule on the Tongass, it also requests that USDA revise the 2016 TLMP Amendment *and* revise the established transition from old growth to young growth harvests (DEIS: A-4).

The SOA's petition suggests that the Tongass Roadless Rule is an unnecessary protective policy layer, stating that these roadless areas would be protected with or without the Roadless Rule. Not as clearly stated, but deduced by the content of the entire petition, is that the SOA is seeking access and funding to harvest the most accessible and productive old growth stands currently protected by the Roadless Rule---the 165,000 acres of old growth that the preferred Alternative (6) in the DEIS would convert from unsuitable for timber production to suitable. Is the Tongass Roadless Rule unnecessary and duplicative? No--- especially not for the most accessible and productive old growth, areas with some of the greatest ecosystem service production, that would be on the chopping block.

The SOA claims of economic harm from the Roadless Rule are meritless, as are their claims that regional economic and timber industry conditions are the same as 2003. The SOA petitions states:

> "Addressing the serious socioeconomic consequences to Alaskans and complying with ANILCA and TTRA are all compelling rationale for a Tongass Exemption today, as they were in 2003….The State respectfully submits this petition for a rulemaking to exempt the Tongass from the Roadless Rule in the interest of the socioeconomic well-being of its residents." (DEIS: A7-A8).

These "serious socioeconomic consequences" of the Roadless Rule are never specified. How exempting the Tongass from the Roadless Rule will be in the best "interest of the socioeconomic well-being of its residents" is never detailed. Despite an overwhelming lack of evidence to back up these claims, USDA rests its entire purpose and need on the SOA's petition. Additionally, economic conditions in Southeast Alaska have changed substantially since 2003. TTRA "market demand" is down to 46 million board feet and Asian export markets are waning due to tariff and trade war effects. Mill capacity is a fraction of that in 2003 and the transition to Tongass second growth has commenced. Regional Tongass timber employment currently represents less than one percent of regional employment.[8] The two largest private industrial sectors in Southeast Alaska are tourism and commercial fisheries, making up about 15% and 10% of regional private employment respectively.[9] These two industries, tourism and seafood production, are the real drivers of the regional economy and are directly dependent upon the protected roadless forests of the Tongass. The economics question is, why would the federal government remove roadless protections to boost a dying industry (i.e., logging) while irreversibly damaging the natural resources that the rest of the regional economy depends on?

The SOA claims that a Tongass exemption from the Roadless Rule is needed for economic development (i.e, clearcutting old growth), but has provided zero economic evidence for this need, nor any details of how societal benefits would outweigh the costs of development. In summary, the only purpose or need for this rulemaking is to direct greater federal tax dollars to build roads to clearcut old growth forests in Southeast Alaska. This is illogical from almost all perspectives and is an insufficient purpose and need for such a damaging rulemaking.

2.2 The DEIS Purpose and Need is Irrational

Likewise, the Forest Service makes bold claims about supposed economic benefits of the proposed rule:

> "The proposed rule is expected to yield a range of benefits (or cost reductions) derived from greater flexibility and a positive net benefit (USDA Forest Service 2019b) and economic opportunities for small business. For example, greater flexibility is provided for the selection of future timber sale areas and sale design (depending on the planning areas selected); and could, in turn, potentially improve the Forest Service's ability to offer economic sales that meet the needs of industry." (RIA: 26)

Upon closer examination, only one benefit has been illustrated---cost reduction in felling, yarding, and loading harvest costs. As shown below, this is not a benefit nor is it accurately calculated. There simply is no positive net benefit from the proposed rule. The citation provided to supposedly show positive net benefit contains no document that illustrates increased net benefit. To provide a useless citation as the source for demonstrating improved economics from the rulemaking is suspect and indicates that there

[8] Alexander, B. and R. Gorte. 2014. The Tongass National Forest and the Transition Framework: A New Path Forward? Bozeman, MT: Headwaters Economics, 32p.
[9] *Ibid*.

are actually no positive benefits to report. Finally, the only effects on small businesses demonstrated in the DEIS are adverse effects on small tourism guides and outfitters.

The real purpose and need given in the DEIS is that:

> "The USDA and Forest Service believe the 2001 Roadless Rule prohibitions on timber harvest and road construction/reconstruction can be adjusted for the Tongass in a manner that meaningfully addresses local economic and development concerns and roadless area conservation needs." (DEIS: ES-2).

While this might be a noble intention, the DEIS tells us that neither economic development concerns, nor roadless area conservation needs, will be meaningfully addressed. In the DEIS, it is estimated that there will be no changes in regional employment and no changes in overall timber production. The proposed rule would eliminate all Roadless protections from 9.2 million acres; this certainly does not address roadless conservation needs. How exactly does the preferred rule help the regional economy or address roadless area conservation needs?

We know that timber harvest and road construction miles in Tongass roadless areas will be greater than zero. Otherwise, there is no purpose for this rulemaking. "Alternative 6 is the preferred alternative and provides maximum additional timber harvest opportunity as the full exemption alternative, which was requested by the State of Alaska's petition." (DEIS: 2-16) We also know that a single mile of constructed roads, and a single acre of clearcut old growth, has adverse environmental consequences on water quality, wildlife habitat, fish, deer, and carbon storage. We know that timber harvests in roadless areas will require more road construction than harvests in the roaded timber base. We know a mile of new roads costs substantial amounts of taxpayer dollars, as does road decommissioning. We know that U.S. taxpayers subsidize timber production on the Tongass at a rate from approximately $500--$1,100 per thousand board feet of timber.[10] These average costs, benefits, and damages are not disclosed in the DEIS. USDA must, at a minimum, cite this information and ultimately this requires major revisions to the DEIS.

Preferably, these quantified economic and ecological values should be incorporated into sensitivity analysis that illustrates overall average costs for anticipated small, medium, and large incursions into Tongass roadless areas (e.g., see section 4.2 later in this document). This is not difficult and would be much more reasonable than acting as if the preferred alternative will have zero repercussions on the ground. If nothing will happen from this rulemaking, there is no need for it. Providing rough averages and details of obvious implications of the various alternatives is required by NEPA. That the DEIS simply ignores critical environmental consequences is a fatal flaw rendering the DEIS unusable. A new DEIS must be conducted to account for these fatal flaws.

3. The Economic Reality Ignored in the DEIS

USDA is hitching their horse to old growth timber harvesting on the Tongass, which is about as economically and environmentally prudent as subsidizing antiquated extractive industries like coal

[10] Alexander, B. and R. Gorte. 2014. The Tongass National Forest and the Transition Framework: A New Path Forward? Bozeman, MT: Headwaters Economics, 32p.

mining. With excessive subsidies already required for any Tongass timber production, opening Tongass roadless areas to timber development will only increase total subsidies. Exempting the Tongass from the Roadless Rule will also cause economic harm to Southeast Alaska residents by threatening tourism, commercial fishing, sport fishing, and subsistence economies. Corporate welfare provided to the timber industry comes at the costs to southeast Alaskan residents, Alaskan residents, and U.S. residents. USDA must incorporate the best available science to come to a decision in this rulemaking process. If the rulemaking process is actually bound by NEPA guidelines, utilizes the best available science, and maintains integrity owed to the public, the obvious conclusion would have been selecting the no-action alternative as the preferred alternative.

3.1 Economic Trends of Tongass Timber Production Will Not be Reversed by Opening Tongass Roadless Areas for Development

Large-scale timber production in Alaska has never been sustainable, nor has it ever been profitable. In total, U.S. taxpayers have paid billions of dollars to fund Tongass old growth logging. Southeast Alaska has suffered from the resource curse, where communities propped up by subsidized resource extraction, are left worse off after the experiment ends. The jobs were never sustainable, and the remaining residents are stuck with heavily damaged forests and watersheds from logging. The Tongass has always been a "last in, first out" supplier of wood due to exorbitant production costs, extreme isolation from markets, and a lower quality of wood.[11] These multiple factors make it impossible to have large-scale industrial timber production on the Tongass *without* massive taxpayer subsidies.

The Tongass is simply too remote and too mountainous to ever be profitable in large-scale timber production.[12] Most of the Tongass includes low-value trees, which has been exacerbated by a legacy of high-grading. The biggest and the best trees have already been cut. With extreme isolation and ruggedness, the Tongass has the highest logging and processing costs anywhere. Compared to British Columbia and the Pacific Northwest (PNW) region of the continental U.S., Southeast Alaska has the highest timber manufacturing costs and the lowest stumpage prices, with logging costs being 66% greater than in the PNW.[13]

While the Tongass has always been the most inefficient timber production region in the U.S, the absurdity of perpetuating Tongass old growth logging is that Tongass timber production is only getting more and more inefficient. Recent research[14] shows that for the last six years, Tongass timber expenses by the USFS are $122.5 million while stumpage received, or revenue, is $3.4 million. With costs exceeding benefits by 36 times, the Tongass timber program is an incredibly wasteful federal program.

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[11] Robertson, G. and D. Brooks. 2001. Assessment of the competitive position of the forest products sector in southeast Alaska, 1985–94. Gen. Tech. Rep. PNW-GTR-504. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 29 p.

[12] Crone, L. 2005. Southeast Alaska economics: A resource-abundant region competing in a global marketplace. Landscape and urban planning 72: 215-233.

[13] Robertson, G. and D. Brooks. 2001. Assessment of the competitive position of the forest products sector in southeast Alaska, 1985–94. Gen. Tech. Rep. PNW-GTR-504. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 29 p.

[14] Taxpayers for Common Sense. 2019. Cutting Our Losses: 20 Years of Money-Losing Timber Sales in the Tongass. Available at https://www.taxpayer.net/wp-content/uploads/2019/09/TCS-Cutting-Our-Losses-2019-.pdf

The inevitable decline in Tongass timber production is obvious. Employment from Tongass timber production currently sits at an all-time low of approximately 61 jobs. (DEIS: 3-28) The economic trends for timber production and jobs have been steadily decreasing since the closure of the region's pulp mills for both Tongass NF associated production and the entire southeast Alaska region. Due to the exorbitant production costs, isolation from markets, and long-term high grading discussed above, a large-scale timber industry from Tongass production simply isn't feasible. The economic trends will not be reversed by removing roadless protections, nor will it be overcome by subsidizing the industry $30 million a year. A visual projection of Tongass timber jobs clearly illustrates the futility of wasting taxpayers' dollars on corporate welfare.

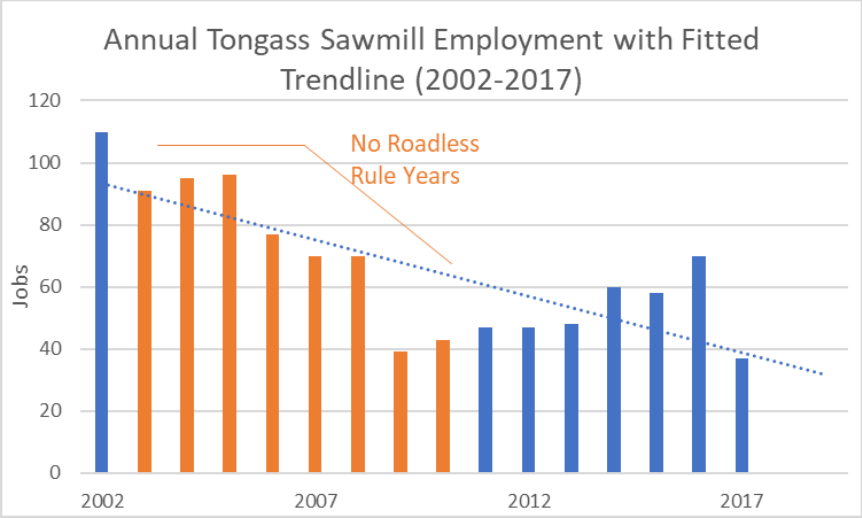

Figure 1: Source for employment data--DEIS Table 3.2-2: 3-28.

Figures 1, 2, and 3 show the steady decline of timber related employment in southeast Alaska and the Tongass. It is important to remember that the last 20 years included multiple Administrations, eight exempt years from the Roadless Rule, and consistent and heavy federal subsidization of logging roads and timber production. For the SOA to claim that the same economic rationale for exempting the Tongass from the Roadless Rule in 2003 exists today is blatantly ignoring all market evidence since then.

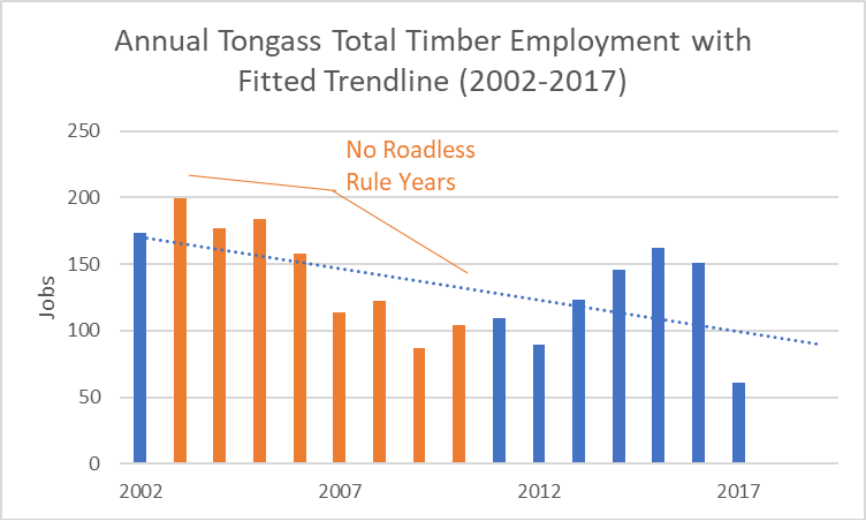

Figure 2: Source for employment data---DEIS Table 3.2-2: 3-28.

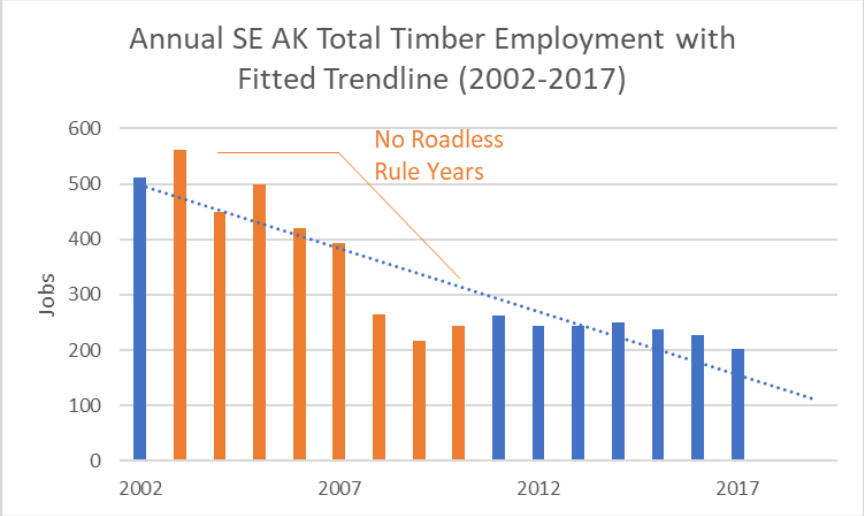

Figure 3: Source for employment data---DEIS Table 3.2-2: 3-28.

The timber industry and Alaska politicians hope that increasing federal timber supply on the Tongass will revive a shell of an industry. However, these hopes are unfounded. Wood supply has never been the problem for the lack of profitability for Tongass timber production. A 2004 legal decision (U.S. Federal Court of Claims, No, 95-153C, Alaska Pulp Corporation (APC) v. United States of America) showed that APC was unprofitable regardless of provisions associated with the Tongass Timber Reform Act (TTRA). Furthermore, recent Tongass timber sales demonstrate that wood supply is still not an issue. From 2000-2010, a period largely exempt from the Roadless Rule, nearly 50 % of Tongass timber sales offered were not bid on at all; of the timber that did sell, approximately 40 % of that supply was defaulted on by the

operators or mutually cancelled.[15] The most recent efforts to increase logging by subsidizing prohibitive road construction and timber sale planning costs are still proving to be impossible to overcome the severe lack of profitability. The North Kuiu timber sale has been offered in 2016 and again in 2018. Despite extreme subsidies attached to the timber sale, the sale has received zero bids.[16]

The clear trends indicate that markets and employment for Tongass timber are dying because industrial logging on the Tongass is just too expensive, with or without the Roadless Rule. How can USDA defend its purpose and need for expanding timber opportunities when all evidence shows that exempting the Roadless Rule will not be enough to overcome the dismal economics that characterize southeast Alaskan timber production? Where is the support for SOA's claims in their petition? Where is the scientific evidence in the DEIS? Why is the best available science regarding the lack of economic viability for Tongass timber excluded from the DEIS? This undermines the entire DEIS.

4. The Regulatory Impact Assessment and Cost-Benefit Assessment are Not Credible and are Legally Inadequate

USDA has determined that this rulemaking is a significant rule, per the direction of Executive Orders 13563 and 12866. These orders require federal agencies to conduct a regulatory analysis for economically significant regulatory actions, or those that have an annual economic effect greater than $100 million or adversely affect the economy or economic sectors. As USDA estimates the economic effects of the proposed rule to be less than $100 million annually, the reasoning for determining this as a significant rule is due to anticipated adverse effects to the economy and individual economic sectors. Executive Orders 13563 and 12866 mandate cost-benefit analysis of significant rules and instructs the agency to choose regulatory approaches that "maximize net benefits." From the RIA:

> "Executive Orders 13563 and 12866 direct agencies to assess costs and benefits of available regulatory alternatives and, if regulation is necessary, to select regulatory approaches that maximize net benefits (including potential economic, environmental, public health and safety effects, distributive impacts, and equity). Executive Order 13563 emphasizes the importance of quantifying both costs and benefits, of reducing costs, of harmonizing rules, and of promoting flexibility." (RIA: 4)

Despite the noted importance of quantifying both costs and benefits, USDA has failed to quantify any real costs or benefits in the RIA. One cost and one benefit are quantified---savings in timber harvest costs (which are not really savings) and revenue losses for outfitters and guides. The purported savings in harvest costs are inaccurate and neither one of the costs are appropriate inputs for cost-benefit assessment and should have been included as distributional effects. In addition to inappropriate and inaccurate inputs, the actual calculations of the Net Present Valuation (NPV) appear to be wrong.

[15] Hjerpe, E. 2011. Seeing the Tongass for the Trees: The Economics of Transitioning to Sustainable Forest Management. Washington: The Wilderness Society, 61p. Available at https://www.researchgate.net/publication/301553259_The_Economics_of_a_Tongass_Transition

[16] https://www.juneauempire.com/news/controversial-timber-sale-cant-find-a-bidder/

In this section, I illustrate the numerous shortfalls in the RIA. These shortfalls are fatal flaws for the entire DEIS, as the economic analysis contained in the RIA is the basis for the environmental consequences in the DEIS. After a review of the analysis included in the RIA, I provide a credible, economically rigorous cost-benefit assessment of the proposed rule that should be used in a revised DEIS. The results of the new CBA clearly show, with reasoned determination, that the benefits of the exempting the Tongass from the Roadless Rule are much less than the costs. That is, the preferred rule is clearly not in the best interest of the public. To meet legal standards for cost-benefit assessments for public lands, USDA must withdraw the net present valuation (NPV) presented in Table 6 (RIA: 35) and incorporate the credible CBA presented at the end of this section in a revised DEIS.

4.1 The Cost-Benefit Assessment is Rudimentary and Wholly Inaccurate

Cost-benefit assessment is used to compare projected management scenarios such as the preferred Alternative to a baseline. In this case, the baseline is the no-action Alternative of keeping the Tongass Roadless Rule in place. The baseline comparison is similar to a with/without analysis. That is, what are the projected changes in costs and benefits if the preferred Alternative (6) is adopted?

Furthermore, it is important to understand the role of Executive Order 13463 and federal guidelines for cost-benefit assessment. Quantifying costs and benefits are emphasized, but if only a few costs and benefits can be quantified, it is still imperative to include "reasoned determination" that the benefits of regulatory actions justify the costs…. "Executive Order 13563 recognizes that a quantifiable analysis is not always possible, but must include a reasoned determination that the benefits justify the regulatory costs." (RIA: 22)

The question being asked at the beginning of the RIA should be "do the benefits justify the costs?" Instead of starting with an open question and working to a reasoned determination, it appears as if USDA worked backwards from a pre-determined answer regarding costs and benefits. There is no other way to account for the errors and lack of economic rigor in the presented CBA. In no way does the RIA and CBA pass scientific or legal muster.

4.1.1 Timber Harvesting Costs Will Increase in Roadless Areas, Not Decrease

Trendlines over time for three timber harvesting costs, out of many, are used to suggest that harvest costs will be reduced by exempting the Tongass from the Roadless Rule. This is the only quantified "benefit" in the CBA. In short, this estimate and the use of this estimate as the only quantified benefit in the CBA, does not constitute credible economic analysis.

For starters, the harvesting costs isolated (felling, yarding, and loading) are just three components of a number of total timber harvest costs and have little meaning when presented in isolation, or cherry picked as done in the DEIS and the RIA. USDA openly admits that the harvest costs presented in the CBA are one set of many harvest costs. For example:

> "In practice, many factors can influence the cost of timber harvest, adding economic risks for potential purchasers and affecting the ability of the Forest Service to offer timber sales. Road construction, helicopter yarding, complex silvicultural prescriptions, setting size, and other factors may increase costs, which then decrease the value of the offering." (RIA: 29).

How the USDA doesn't also include road construction, road decommissioning, and road maintenance costs in this CBA is bewildering, especially as they admit that timber road costs will increase in roadless

areas. Furthermore, road construction for timber sales are a cost to the USFS and the public taxpayer[17] whereas felling, yarding, and loading are typically costs covered by timber sale purchasers. USDA has extensive data on the need for more roads per unit of wood harvest in roadless areas, as well as extensive data on road costs. Why were these not included? Why were just a few harvesting costs cherry-picked?

Additionally, the point estimate of reduced harvest costs has no data to back it up and ultimately has nothing to do with the Roadless Rule. Changes in harvesting cost will not be the result of efficiency gains. The USDA's cost-benefit assessment (Table 6, RIA: 35) presents supposed reductions in harvest costs to the timber industry as benefits by comparing timber data for the eight years of the Roadless Rule exemption (2003-2010) to the eight most recent years with the Roadless Rule in place (2011-2018). A simple comparison of the years with and without the Roadless Rule is completely arbitrary and USDA has not made any case on why harvesting costs would change with and without the Roadless Rule.

Science involves developing a hypothesis first, then testing it. But USDA has provided no logical explanation of why harvest costs would be reduced in roadless areas---because they will not be reduced. Tongass timber harvesting costs have been continually increasing for decades, as high grading forces every subsequent timber sale farther up the watershed and towards less valuable wood (greater defect and smaller trees) and less accessible wood (i.e., steeper slopes). While shifting 165,000 acres of Roadless old growth to the suitable timber base may open a few low-elevation, high-volume stands for harvest,[18] overall harvest costs throughout roadless areas will increase due to increased road construction. Felling, yarding, and loading harvest costs are also likely to increase, rather than decrease, when estimating harvest costs across the entire 165,000 acres of old growth---as opposed to just estimating felling, yarding, and loading costs on the most productive 18,000 acres.[19]

Ultimately, USDA has confused the results of a short-term comparison of all timber sales for years before and after the Roadless Rule was back in place (2011), with efficiencies in harvesting costs due to Roadless designation. This is a critical error that undermines the entire CBA. USDA needs to withdraw the current DEIS and revise it to include long-term harvest cost trends dating back to at least the 1980s and adjusted for inflation. Long term harvesting cost trends would likely show continual increases in harvestings costs over time. USDA must also include full engineering and linear programming (e.g. Woodstock model analysis) reports estimating road construction needs, road costs, and other harvesting costs for Roadless old growth forests shifted to the suitable timber base.

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[17] Road construction needed for Tongass timber harvests are fully subsidized by the USFS. When timber sale appraisals are negative, the USFS will tend to pre-road to help sell the timber. Tongass timber managers are directed to reclassify roads as Public Works when dealing with negatively appraised sales (e.g., see R10 Timber Appraisal direction documents). In other sales, the USFS will give purchaser road credits to timber sale purchasers for the estimated cost of road construction. These purchaser road credits are then used for stumpage fee reductions on that sale or other future timber sales, resulting in losses in stumpage revenue to the U.S. Treasury and full subsidization of timber roads by U.S. taxpayers. The budget line item CMRD (Roads Capital Improvements and Maintenance) is used to pay for timber roads and averaged 50% of overall timber budgets from 2001-2008 and 40% of overall timber budgets from 1999-2018.

[18] USDA estimates that only 59,000 acres of the proposed 165,000 acres of Roadless old growth are high-volume.

[19] USDA claims that the projected harvest on the 165,000 acres of Roadless timber for the preferred alternative (6) will only be 18,000 acres over 100 years (DEIS: 3-19). If this is the case, there is no reason to choose Alternative 6 as the preferred alternative. If converting 165,000 acres of Roadless old growth to suitable for timber production, harvesting costs must be estimated for the potential harvest of all acres and must be presented in a revised DEIS.

4.1.2 USDA Has Mistaken Distributional Effects for Costs and Benefits

Another fatal flaw in the CBA is that USDA has only quantified a market impact to the timber industry and a market impact to the tourism industry, not a benefit or cost to the federal government or the public. That is, if there is a reduction of harvest costs (not likely), it will not save the federal government any money; rather, it will save the timber industry a few bucks. This also critically undermines the CBA.

At the beginning of the CBA, USDA states that:

> "Benefits and costs are divided into two parts: 1) those which are realized by any organization or individual, and 2) those realized by the Forest Service. Financial considerations include revenues and costs from the perspective of the Forest Service or other government agencies." (RIA: 22)

Upon review of the RIA, however, there are zero quantified costs and benefits presented for the Forest Service or for the taxpayer at large. Additionally, changes to timber industry harvest costs and costs to the tourism industry are not treated as benefits or costs to individuals or organizations when conducting economic efficiency analysis---they are market changes that are classified as distributional effects according to economic theory. Federal regulatory effects on public lands can have implications for specific industry sectors. While these should be examined, they should **not** be included in cost-benefit assessments. Market impacts are considered distributional effects by economists. Distributional effects do not go into the net present valuation (NPV) calculations---NPV is only for the CBA which is part of the "economic efficiency" analysis required in RIAs and DEISs. Some qualitative effects on individual regional industries are described in the Distributional Effects of the RIA (p. 39) where they belong. But using estimated distributional effects for the timber and tourism industries in the CBA is faulty economics and illustrates a lack of economic rigor in the DEIS and RIA.

The numerous footnotes associated with the damage estimates for the tourism industry in the DEIS and RIA help illustrate why industry effects are not considered as costs or benefits, but rather represent redistributions of wealth. This footnote in the RIA refers to the estimates of lost outfitter and guide revenues due to exempting the Tongass from the Roadless Rule:

> "These estimates provide an upper-bound ceiling for consideration of potential lost revenue, alongside cost savings to the timber industry, and should not be used as precise estimates of roadless area visitor expenditures or losses. Expenses incurred by visitors are not necessarily lost but subject to displacement related changes. While some businesses may lose revenues, if visitors choose not to travel to Southeast Alaska, others may see increases in revenues if visitors choose to stay longer or travel to substitute sites within Southeast Alaska." (RIA: 39)

"Displacement related changes" in markets is the very definition of distributional effects. The recreation industry losses are distributional effects, not a societal cost, even though they represent clear economic harm to the southeast Alaskan tourism industry. This is because visitors will spend their money elsewhere. Despite a lack of footnotes in the RIA explaining this same concept for the timber industry, it should be noted that decreases or increases in timber harvest costs paid for by timber companies are also distributional effects.

4.1.3 Cost-Benefit and Net Present Valuation Calculations Make No Sense

The poor economic analyses presented in the RIA is compounded by illogical Net Present Valuation (NPV) calculations and a lack of clarity. Table 6 in the RIA (p. 35) presents USDA's final CBA as

represented by 20-year discounted NPV estimates. Table 6 is difficult to understand for a few reasons. First, costs attributed to the recreation/tourism industry need to be shown as negative numbers, as opposed to currently being presented as positive. Second, a footnote tells the reader that OMB Regulatory Analysis requires the use of two discount rates (3% and 7%). But Table 6 presents NPV estimates under only one discount rate----but which one is not noted. Do the final NPV estimates represent valuation under a 3% discount rate or a 7% discount rate?

Finally, the NPV estimates appear to be wildly inaccurate. Even with incorrect theoretical assumptions for CBA (using distributional effects as costs and benefits), even with arbitrary inputs (incorrect interpretation of reduced harvest costs), the presented NPV estimates still cannot be replicated. If using industry harvest cost reductions of $1 million -- $2 million per year as a benefit in CBA, discounted over 20 years, how does this result in $91 million in NPV for the 46mmbf level and $30 million for the 24mmbf level? From the RIA:

> "Applying cost averages before and after the federal court decision in 2011 ($220 and $265 per MBF, respectively) indicates the proposed rule and Alternatives 2 through 5 could provide approximately $2 million dollars in annual savings at the harvest ceiling of 46 MMBF under the 2016 Forest Plan FEIS." (RIA: 31)

At the upper-bound harvest ceiling of 46 mmbf, harvesting costs reductions are said to be $2 million annually. Specifically, $45/mbf of savings multiplied by 46mmbf equals $2,070,000 of purported savings. To correctly estimate NPV over 20 years, the $2 million in annual savings (or $2.07 million) should be entered as positive cash flow for each of the 20 years. With no discount rate, the NPV would simply be the sum of all 20 years of cash flow, or $41.4 million. However, utilizing a discount rate to account for inflation and a preference for money today as opposed to next year, the $41.4 million NPV is reduced. At a 3% discount rate, the NPV for the 46mmbf level is $30.8 million. At 7% discount rate, the NPV for the 46mmbf level is $21.9 million. The Forest Products Industry—cost savings NPV estimate in Table 6 for the 46mmbf level is $91 million for all alternatives except the No-Action alternative. This estimate is more than three times the real estimate.[20]

The same issues are present for the lower-bound harvest cost NPVs, the Recreation/Tourism cost NPVs, and the final NPVs. USDA needs to clearly articulate how the NPV estimates were calculated. As of now, Table 6 appears to present wildly inaccurate NPV estimates throughout the entire table. Given the numerous problems in the RIA, none of the analysis is to be trusted. None of the analysis is scientifically or legally credible.

4.2 A Credible Regulatory Impact Assessment and Cost-Benefit Assessment

What should have been USDA's approach for assessing costs and benefits of the Tongass Roadless exemption as required in RIAs? That is, what would an economically credible cost-benefit assessment for the Tongass Roadless Rule look like? Below, I detail a scientifically appropriate CBA for the Tongass Roadless Rule to illustrate what is lacking in the DEIS and RIA, and to offer a blueprint for USDA to utilize in a revised DEIS.

[20] For example, at a 7% discount rate, it would require about $8.5 million in annual savings over 20 years to generate an NPV of $91 million. The USDA has attributed an extra $6.5 million in annual cost savings that do not exist, on top of $1-$2 million of annual harvest cost savings that also don't really exist.

If we are to assume that the preferred Alternative will not increase the overall annual Tongass harvest levels and the Projected Timber Sale Quantity (PTSQ), as stated numerous times in the DEIS, we still know that exempting the Tongass from the Roadless Rule will directly lead to timber harvest in current roadless areas (if there will be no harvest in roadless areas, then there is no need for this rulemaking). Expanding Tongass timber production into roadless areas, even if overall forest harvest levels remain the same, will spur a number of economic costs above and beyond the status quo Tongass timber harvest program. These costs include increased road and overall harvesting costs, decreased conservation values, and damages to the quantity and quality of ecosystem services being produced by intact Tongass roadless areas.

USDA has quantifiable secondary data on increased road costs in Tongass roadless areas. Tongass timber road costs, as opposed to felling, yarding, and loading, are primarily paid for by the USFS. Harvest costs of felling, yarding, and loading are the responsibility of the timber sale purchaser and represent costs to the timber industry, not to the USFS or the public. As discussed above, this means that any effects to the timber industry should be placed under the Distributional Effects section. But, changes in costs to the USFS, such as increased roading costs, are changes in societal wealth and need to be included in the cost-benefit assessment. In fact, agency roads for Tongass timber production are the biggest cost contributor for timber budgets, estimated to be 50% of overall agency timber costs from 2001-2008,[21] and over 40% of overall agency timber costs from 1999-2018.[22]

As discussed above, USDA presented no logical reasoning on why harvesting costs would decrease in roadless areas. Harvest costs, including road costs, on the Tongass steadily increase over time as timber sales are continually pushed higher into watersheds and into less economical timber (this includes roadless areas, as they would have already been harvested prior to the 2001 Roadless Rule if they compared to the productivity of stands that have been harvested since the 1950s). Examining harvest costs based only on a comparison of the eight years without the Roadless Rule (2003-2010) to the eight years with the Roadless Rule (2011-2018) is a poor methodology as these years do not actually correlate well with roaded/roadless logging or include all the relevant costs. Few roadless areas were actually harvested from 2003-2010. The USFS has long term data on harvests occurring in roadless areas and should have engineering reports and estimates on the amount and cost of road construction for the 165,000 acres of Roadless old growth that is shifted into the suitable timber base by the proposed rule.[23] Why has this data not been provided in the DEIS? The only logical conclusion is that USDA has not included this essential data because it illustrates that roadless areas will require much greater timber

[21] Hjerpe, E. 2011. Seeing the Tongass for the Trees: The Economics of Transitioning to Sustainable Forest Management. Washington: The Wilderness Society, 61p. Available at https://www.researchgate.net/publication/301553259_The_Economics_of_a_Tongass_Transition

[22] Taxpayers for Common Sense. 2019. Cutting Our Losses: 20 Years of Money-Losing Timber Sales in the Tongass. Available at https://www.taxpayer.net/wp-content/uploads/2019/09/TCS-Cutting-Our-Losses-2019-.pdf

[23] For example, forest planning analysis in the 2016 TLMP Amendment estimates that one mile of new road construction will be needed for every 150 acres of old growth harvest (2016 TLMP EIS: B-27). Extrapolated to the 165,000 acres of old growth that will become suitable under the proposed rule, the preferred alternative may lead to the construction of 1,100 miles of new road, requiring a quarter billion dollars of taxpayer funds. USDA claims that the projected harvest on the 165,000 acres of Roadless timber for the preferred alternative (6) will only be 18,000 acres over 100 years (DEIS: 3-19) ---which would still lead to 120 miles of new road. This leads to the question of why Alternative 6 was chosen as the preferred alternative if only 11% of the Roadless old growth acres will be harvested. Thus, USDA's claims are out of alignment and are suspect.

roads, and thus much greater road construction costs, as compared to harvests in the roaded timber base.

With most of the essential data missing from the DEIS, I use the only data provided by USDA on harvesting costs.[24] These data were received only upon request, as the provided reference in the DEIS was a dead end. Harvesting cost data used by USDA have clear findings of inefficiencies in overall timber harvesting costs----specifically increased timber road costs in Tongass roadless areas. The data reveals that the Roadless exemption period (2003-2010) required, on average, three times the miles of new road construction for timber sales as compared to the period when the Roadless Rule was back in place (2011-2018). An annual average of 15.3 miles of new roads were built during Roadless exemption years, but only 5.0 miles of new road were annually constructed with the Roadless Rule in place despite only slightly greater acres harvested in Roadless exemption years (an annual average of 1,700 acres harvested vs 1,400 acres harvested per year from 2011-2018). Clearly, extending timber sales into Tongass Roadless will require many more miles of road as compared to keeping timber sales out of Roadless.

Furthermore, the timber sale information before and after the Roadless Rule change in 2011 show that for every million board feet (mmbf) of Tongass timber harvested during the Roadless Rule exemption, twice as many miles of new roads were constructed as were for every million board feet harvested with the Roadless Rule in place. From 2003-2010, .42 miles of new road were constructed for every million board feet harvested. From 2011-2018, only .21 miles of new road were required for every million board feet harvested, indicating that harvest in Tongass roadless areas will require, on average, .21 more miles of new road construction for each million board feet harvested. While overall Tongass harvest levels may stay the same under the current Roadless rulemaking, overall agency road costs are bound to increase, decreasing Tongass timber production efficiency and increasing federal subsidies. And, as stated earlier, the 2003-2010 to 2011-2018 roadless rule dichotomy is a poor estimate of harvest costs, and the actual increase in roads and road costs for Roadless timber are likely much greater than the data used in this analysis.

While there is variance in Tongass road costs, especially in regard to slope angle, average forest-wide road construction costs were estimated at $185,000 per mile and $50,000 per mile for maintenance in the 2008 TLMP.[25] Adjusting for inflation reveals that current Tongass road construction costs are approximately $225,000 per mile. By incorporating projected timber sale incursions into roadless areas and the increase in average road construction costs, a credible cost-benefit assessment can be conducted. Because the Tongass timber sale program loses substantial amounts of money (i.e., stumpage fees are a fraction of agency timber costs) and damages all other resources and industries, there are no benefits to include in a cost-benefit assessment of exempting the Tongass from the Roadless Rule.

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[24] The USDA reference for Tongass timber harvesting costs presented in the RIA (e.g., p. 29) is presented as "USDA Forest Service 2019b. Timber Sale Summary Reports and Accomplishments, Region 10 RV (Residual Value) Appraisals of Record (1+ MMBF, from 2003 to 2018) available at: https://www.fs.usda.gov/detail/r10/landmanagement/resourcemanagement/." No document with the referenced data was available at the listed website. Upon requesting the source for harvesting cost information, USDA released an Excel spreadsheet titled "Region 10 timber sales before and after 2011 Roadless ip 112219."

[25] 2008 FEIS, TLMP Amendment, Vol. II, App. B at B-11.

While the rulemaking does not authorize site-specific activities, it does authorize a shifting of Tongass timber sales to roadless areas. To provide a general overview of costs and benefits of increasing Tongass timber sales in roadless areas, I examine three potential outcomes: small, medium, and large timber sale incursions into roadless areas.[26] Utilizing the same upper and lower bound of anticipated Tongass timber harvest as presented in USDA's cost-benefit assessment (Table 6 of the RIA, p. 35), I conducted a net present valuation of shifting 25% (small), 50% (medium), and 75% (large) of projected timber sales into roadless areas. Table 1 shows the harvest scenarios and the annual timber road cost increases associated with each scenario.

Table 1: Roadless Timber Incursion Scenarios for Tongass Roadless Rule Cost-Benefit Assessment

Type of Roadless Timber Incursion	Harvest Scenario	MMBF Harvested in Roadless Areas	Additional Roads /mmbf	Addtional Miles of New Road Needed	Road Costs/mile	Annual Timber Road Cost Increase
	Upper-bound--46MMBF harvest ceiling					
Small	25% of timber sales shifted to Roadless	11.5	0.21	2.42	$ 225,000	$ 543,375
Medium	50% of timber sales shifted to Roadless	23	0.21	4.83	$ 225,000	$ 1,086,750
Large	75% of timber sales shifted to Roadless	34.5	0.21	7.25	$ 225,000	$ 1,630,125
	Lower-bound--24MMBF					
Small	25% of timber sales shifted to Roadless	6	0.21	1.26	$ 225,000	$ 283,500
Medium	50% of timber sales shifted to Roadless	12	0.21	2.52	$ 225,000	$ 567,000
Large	75% of timber sales shifted to Roadless	18	0.21	3.78	$ 225,000	$ 850,500

With a range of Roadless harvest scenarios, sensitivity analysis can be conducted to provide a realistic range of road construction cost increases expected under the proposed rule. Table 2 illustrates the NPV for road construction cost increases under two discount rates. These NPVs show tremendous costs over the next 20 years, losses ranging from $3 million to $24 million.

[26] The Roadless timber sale incursion scenarios utilize the USFS-provided data on harvesting and road needs that are based on the eight years with no Roadless Rule (2003-2010) compared to the eight years with the Roadless Rule (2011-2018). As discussed in the text, this short-term comparison of the road/roadless dichotomy is a poor substitute for data focused strictly on timber sales and harvest in roadless areas. The USFS data also only include estimates of new road miles needed per mmbf of harvest. Yet, numerous miles of timber roads have been constructed for sales that go unsold and for large portions of timber sales that are regularly defaulted on. The result is that the presented increase in annual road construction and road costs in this section is likely to be vastly underestimated.

Table 2: Net Present Valuation of 20-Year Discounted Agency Timber Road Cost Increases for Proposed Rule (Alternative 6)[1]

Full Exemption Alternative Scenarios for Proposed Rule		Increased Annual Agency Road Cost	NPV @ 3%	NPV @ 7%
Upper-bound--46MMBF harvest ceiling				
Small	25% of timber sales shifted to Roadless	($543,375)	($8,084,000)	($5,757,000)
Medium	50% of timber sales shifted to Roadless	($1,086,750)	($16,168,000)	($11,513,000)
Large	75% of timber sales shifted to Roadless	($1,630,125)	($24,252,000)	($17,270,000)
Lower-bound--24MMBF				
Small	25% of timber sales shifted to Roadless	($283,500)	($4,218,000)	($3,003,000)
Medium	50% of timber sales shifted to Roadless	($567,000)	($8,436,000)	($6,007,000)
Large	75% of timber sales shifted to Roadless	($850,500)	($12,653,000)	($9,010,000)

[1]OMB Circular A-4 - Regulatory Analysis (Sep 17, 2003) requires use of two discount rates (both 3 and 7 percent).

Economic efficiency analysis, or cost-benefit assessment, on public lands must also include the opportunity costs, or benefits foregone, of choosing a preferred land management alternative.[27] That is, what benefits will be foregone by removing Tongass Roadless protections? In the case of the proposed full exemption, the greatest loss of benefits occur to societal conservation values held for pristine and protected Tongass forests. Conservation values are comprised of both use and passive use values held for intact Tongass old growth forests such as those contained in roadless areas. Combined, use and passive use values are known as Total Economic Value (TEV). Use values include direct and indirect use values, such as consumer surplus for recreation and benefits received from ecosystem services produced by roadless areas such as clean drinking water. Passive use values include option, bequest, and existence values held for Tongass roadless areas. Because conservation values are largely comprised of non-market values, they are not as easy to quantify as board feet of timber harvested and typically require direct survey techniques focused on willingness to pay for conservation.

Agencies are traditionally forced to use existing secondary data for analysis as the costs and time for gathering primary data for all regulatory actions is prohibitive. Many national forests may not have existing secondary data on willingness to pay values for forest conservation, to use for quantifying opportunity costs in cost-benefit assessment of development activities. Fortunately, the Tongass does. Recent peer-reviewed research[28] describes a choice experiment quantifying regional Alaska residents' willingness to pay for conserving Tongass old growth forests as opposed to harvesting them. Econometric analysis shows that Alaska residents are willing to pay $150 per acre for the conservation, not harvest, of Tongass old growth in the suitable timber base.[29] As the preferred Alternative (6) shifts

[27] See for example, Freeman, A. M. (2003). The Measurement of Environmental and Resource Values. *Resources for the Future. Washington DC,* p.202; and Hjerpe, E. E., & Hussain, A. (2016). Willingness to pay for ecosystem conservation in Alaska's Tongass National Forest: a choice modeling study. *Ecology and Society*, *21*(2).
[28] Hjerpe, E. E., & Hussain, A. (2016). Willingness to pay for ecosystem conservation in Alaska's Tongass National Forest: a choice modeling study. *Ecology and Society*, *21*(2). Available at https://www.ecologyandsociety.org/vol21/iss2/art8/
[29] *Ibid.*

165,000 acres of Roadless old growth to suitable for timber production, a total conservation benefit value of $24,750,000 (165,000 acres X $150/acre) is lost. These foregone benefits are a one-time societal cost, regardless of how many acres are eventually harvested. Just knowing that these once pristine and roadless areas are open to timber development and have lost their protective status results in the substantial losses in ecosystem conservation value.

Adding in lost conservation benefits[30] as opportunity costs associated with the proposed rule allows for a complete cost-benefit assessment to be estimated, one that appropriately accords with economic theory. Table 3 shows a full cost-benefit assessment of the proposed rule under two discount rates and under six Roadless timber incursion scenarios.

Table 3: Net Present Valuation of 20-Year Discounted Costs and Benefits for Proposed Rule (Alternative 6) Under Six Roadless Incursion Scenarios[1,2,3]

Full Exemption Alternative Scenarios for Proposed Rule		Increased Annual Agency Road Cost	Lost Conservation Benefits*	NPV @ 3%	NPV @ 7%
Upper-bound--46MMBF harvest ceiling					
Small	25% of timber shifted to Roadless	($543,375)	($24,750,000)	($32,113,000)	($28,887,000)
Medium	50% of timber shifted to Roadless	($1,086,750)	($24,750,000)	($40,197,000)	($34,644,000)
Large	75% of timber shifted to Roadless	($1,630,125)	($24,750,000)	($48,281,000)	($40,400,000)
	Lower-bound--24MMBF				
Small	25% of timber shifted to Roadless	($283,500)	($24,750,000)	($28,247,000)	($26,134,000)
Medium	50% of timber shifted to Roadless	($567,000)	($24,750,000)	($32,465,000)	($29,138,000)
Large	75% of timber shifted to Roadless	($850,500)	($24,750,000)	($36,682,000)	($32,141,000)

*Loss of conservation benefits are entered as a one-time cost in Year 1 only.

[1]The baseline for comparison is a continuation of the 2001 Roadless Rule (No-Action Alternative). The No-Action Alternative would produce zero increased costs and has an NPV of $0, a substantially higher NPV than the preferred Alternative.

[2]As there are no economic benefits for exempting the Tongass from the Roadless Rule, the cost-benefit analysis is comprised only of costs and all scenarios result in negative NPV estimates.

[3]OMB Circular A-4 - Regulatory Analysis (Sep 17, 2003) requires use of two discount rates (both 3 and 7 percent).

[30] WTP estimates in Hjerpe and Hussain (2016) are comprised of both use and passive use values. Choice experiment respondents were provided information on environmental damages from Tongass timber production, along with tradeoffs such as providing for timber employment. The average WTP for conserving Tongass old growth includes the societal value for passive use, such as bequest values for knowing that our children will have pristine old growth forests. It also includes the value society holds for avoiding the associated environmental damage that comes from clearcutting old growth. This value includes direct and indirect use values such as damages to subsistence ability (direct use value) and damages to carbon sequestration that affects climate change (indirect use value). The overall WTP is a value known in economics as Total Economic Value (TEV) and is currently the best way to capture societal value held for avoiding environmental damages and foregone conservation benefits when protected areas lose their protective designation.

The cost-benefit assessment shows that all scenarios result in negative NPV, losses ranging from $26 million to $48 million. But the reality is that adoption of the proposed rule will result in much greater losses than illustrated in Table 3. The presented cost-benefit assessment is conservative in every analyzed cost. Not included in this assessment are the additional road decommissioning costs that will be spurred by greater road construction in roadless areas along with greater road maintenance costs. If nearly all of the newly constructed timber roads in roadless areas will be decommissioned, as stated in the DEIS,[31] then the additional roads needed for timber harvest in roadless areas will also result in additional road decommissioning needs. Roads that are not decommissioned will require maintenance. Road maintenance and decommissioning will likely increase overall road costs used in this analysis by 50%. It is strongly recommended that USDA incorporate increased road decommissioning costs in a revised DEIS.

Administrative costs associated with increased road building in roadless areas are estimated to be 40% of overall timber program costs.[32] Additional road construction needs in roadless areas will lead to much greater USFS administration, contracts, and site development needs. Instead of working on restoration projects and land management activities that benefit fish and wildlife, more USFS employees will be needed to administer road construction in roadless areas. In the revised DEIS, USDA should include additional taxpayer costs in indirect and overhead expenses associated with additional road construction that will be spurred by the proposed rule.

Mean willingness to pay estimates used for determining lost conservation benefits were only extrapolated to Alaskan residents[33] and are also very conservative estimates. Given the importance and uniqueness of the Tongass as spectacular public lands, we know that old growth conservation values for the Tongass extend to some degree throughout the rest of the U.S. Given its vast carbon stores, Tongass roadless areas are valued for their conservation throughout the entire world. Research[34] has shown that willingness to pay values, especially for the conservation of iconic and scarce landscapes such as coastal temperate rainforests, extend thousands of miles from the valuation site. USDA should model lost Tongass conservation benefits for the entire U.S. in the revised DEIS.

Finally, other opportunity costs of a Tongass Roadless Rule exemption are omitted in the RIA and DEIS. Increased agency costs from the proposed rule could be used for other, more sustainable, Tongass opportunities instead. For example, if it is "jobs-in-the-woods" that USDA and the State of Alaska are seeking, the focus should not be on developing Tongass roadless areas. The focus and subsidies should

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[31] Page 43 of the RIA… "Nearly all new roads constructed under the regulatory alternatives would be closed following harvest."

[32] Hjerpe, E. 2011. Seeing the Tongass for the Trees: The Economics of Transitioning to Sustainable Forest Management. Washington: The Wilderness Society, 61p. Available at https://www.researchgate.net/publication/301553259_The_Economics_of_a_Tongass_Transition

[33] See Hjerpe, E. E., & Hussain, A. (2016). Willingness to pay for ecosystem conservation in Alaska's Tongass National Forest: a choice modeling study. *Ecology and Society*, *21*(2).

[34] For dam removal and salmon WTP, Loomis (1996) found that the rest of the U.S. households reflected 97% of the benefits. For protecting California old growth forests from fire, Loomis and Gonzalez-Caban (1996) found that nonresidents WTP declined by only 1% for each 1000-mile increase. See: Loomis, J. B. 1996. How large is the extent of the market for public goods: evidence from a nationwide contingent valuation survey? *Applied Economics* 28:779-782 and Loomis, J. B., and A. Gonzalez-Caban. 1996. The importance of the market area determination for estimating aggregate benefits of public goods: testing differences in resident and nonresident willingness to pay. *Agricultural and Resource Economics Review* 25:161-169.

be directed at vastly increasing Tongass recreation and restoration budgets. The Forest Service estimates that there are 500 miles of Tongass fish streams in need of in-channel restoration, along with 15,000 acres of riparian second growth in need of thinning (USFS 2006).[35] There are also 2,300 miles of closed roads on the Tongass, over 500 miles of which represent opportunities for improving water quality and fish habitat (USFS 2006).[36] USDA must focus on community stability and job creation that *help* maintain and restore environmental functions, as opposed to coming at the *cost* of the environment.

4.3 Cost-Benefit Assessment of the Tongass Timber Program

In addition to the cost-benefit of the proposed rulemaking that must be presented in the RIA, USDA should also include overall cost-benefit assessments of increasing Tongass logging. That is, because the proposed rule without limitation on future plan amendments opens the door to substantially greater roadless intrusions over time, the RIA needs to consider the potential costs and benefits of longer range and broader scale old growth logging and road construction than it currently does. An overview of costs and benefits for the Tongass timber program, above and beyond the Roadless rulemaking, would properly frame the significant taxpayer losses associated with any rulemaking aimed at maintaining or increasing Tongass timber harvests. Illustrating the huge subsidies required to produce Tongass timber would more clearly demonstrate that any federal policy that will boost the timber industry will exacerbate existing economic inefficiencies (i.e., increase the costs to benefits ratio).

From a societal perspective, timber production on federal lands have costs associated with preparing timber sales and lost conservation values. Correlating benefits are associated with revenue, or stumpage fees paid by private corporations to the USFS for access to publicly owned timber. In the last decade, there have been four studies that have quantified overall costs and benefits of the Tongass timber program. Interestingly, only one of these studies is acknowledged in the DEIS and RIA. To fill the gap in the Tongass timber program cost-benefit literature, I present the details of the four studies in Table 4.

Table 4: Research on Cost-Benefit Ratios for Tongass Timber Program

Source	Years	Costs	Benefits (Revenue)	Cost-Benefit Ratio	Notes
Taxpayers for Common Sense (2019)	1999-2018	$632 million	$33.8 million	18.7	Includes road costs
Hjerpe and Hussain (2016)	2008, 2012	$108.5/mbf	$7.12/mbf	15.2	Does **not** include road costs; includes lost conservation benefits
GAO (2016)	2005-2014	$12.5 million/year	$1.1 million/year	11.4	Does **not** include road costs
Hjerpe (2011)	2001-2008	$255 million	$7 million	36.4	Includes road costs

Sources: Taxpayers for Common Sense. (2019). Cutting Our Losses: 20 Years of Money-Losing Timber Sales in the Tongass; Hjerpe, E. E., & Hussain, A. (2016). Willingness to pay for ecosystem conservation in Alaska's Tongass National Forest: a choice modeling study. *Ecology and Society*, *21*(2); USGAO. (2016). Tongass National Forest: Forest Service's Actions Related to Its Planned Timber Program Transition. GAO-16-456; Hjerpe, E. (2011). Seeing the Tongass for the Trees: The Economics of Transitioning to Sustainable Forest Management. Washington: The Wilderness Society, 61p.

[35] USFS. 2006. Investing in habitat improvements vital for ecological sustainability, local economies, subsistence users. Alaska Region Newsletter, June 2006. 2p.
[36] *Ibid.*

From 1999 to 2018, USFS spending on roads in the Tongass made up more than 40% of all timber sale expenses.[37] To compare similar cost-benefit ratios, I update two of the estimates that previously did not include road costs by adding in road costs at 40% of total costs. Table 5 illustrates complete cost-benefit ratios for the Tongass.

Table 5: Research on Full Cost-Benefit Ratios for Tongass Timber Program

Source	Years	Total Costs	Total Benefits (Revenue)	Cost-Benefit Ratio
Taxpayers for Common Sense (2019)	1999-2018	$632 million	$33.8 million	**18.7**
Hjerpe and Hussain (2016)	2008, 2012	$181/mbf	$7.12/mbf	**25.4**
GAO (2016)	2005-2014	$20.8 million/year	$1.1 million/year	**18.9**
Hjerpe (2011)	2001-2008	$255 million	$7 million	**36.4**

Throughout different periods over the last 20 years, the Tongass timber program has a total cost-benefit ratio ranging from 18.7—36.4, with an average cost-benefit ratio of 25. That is, on average, for every $1,000,000 received by the U.S. Treasury in Tongass timber stumpage fees, U.S. taxpayers pay $25,000,000 in federal agency costs to subsidize timber harvest. It is important to note that these timber program costs do not include associated indirect and overhead expenses which were estimated at 40% of total costs for Tongass timber from 2001—2008.[38]

With costs exceeding benefits by 25, and only 61 total Tongass timber jobs supported by millions in taxpayer dollars, the Tongass timber program makes zero economic sense. Over the years, the federal government loses billions of dollars while causing substantial ecological damage. The original Roadless Rule was put in place to eliminate this exact government waste and to avoid this exact ecological destruction. Any federal rulemaking related to Tongass timber production, and specifically the current proposed Roadless exemption, should start with economic facts that clearly show that any attempts to maintain or increase Tongass timber production will only create greater societal losses. Only when dealing with the economic facts can a reasonable determination be made that exempting the Tongass from the Roadless Rule is bad business.

4.4 Agency Costs and Control of Regulatory Costs

In the RIA section "Agency Costs including Control of Regulatory Costs" (RIA: 37), USDA provides no evidence that agency costs will be reduced. USDA conflates incorrectly presumed timber industry savings in reduced harvest costs to reduced agency costs. This is incorrect. The economic reality is that

[37] Taxpayers for Common Sense. 2019. Cutting Our Losses: 20 Years of Money-Losing Timber Sales in the Tongass. Available at Available at https://www.taxpayer.net/wp-content/uploads/2019/09/TCS-Cutting-Our-Losses-2019-.pdf

[38] Hjerpe, E. 2011. Seeing the Tongass for the Trees: The Economics of Transitioning to Sustainable Forest Management. Washington: The Wilderness Society, 61p. Available at https://www.researchgate.net/publication/301553259_The_Economics_of_a_Tongass_Transition

agency costs will sharply increase under the proposed rule, especially for road construction, road decommissioning, and road maintenance.

The Introduction section of the RIA states:

> "If costs from potential displacement of recreationists accrued they would occur alongside cost reduction from more acres of land available for timber harvest. Timber harvest levels on the Tongass NF are set by the 2016 Forest Plan (USDA Forest Service 2016) and continual timber demand monitoring, currently 46 million board feet (MMBF). The propose rule (Alternatives 6) would increase flexibility for timber managers for designing timber sales that appraise positive." (RIA: 6)

How would agency "cost reductions" occur by making more acres of land available for timber harvest? This is nonsensical. Expanding the Tongass woodshed will increase costs and will certainly **not** lead to cost reductions.

The section continues:

> "Cost savings from improved flexibility could, in turn, potentially improve the Forest Service's ability to offer economic sales that meet the needs of industry. Areas closer to markets, either a mill or export facility, are also more likely to offer more economic timber sale options. More distant areas would be relatively expensive to harvest and less likely to be accessed." (RIA: 6)

Cost savings for the agency are never divulged in the RIA or DEIS. What are these costs savings and how would they occur? By the USDA's own admission, agency costs for timber production would substantially increase in roadless areas. Purported harvest costs reductions accrue to the timber industry only. These are not savings for the agency, nor public taxpayer savings. This statement is wholly inaccurate and is simply is not supported in the RIA. This appears to be an attempt to mislead the public and an attempt to satisfy Executive Order 13771. Contrary to this concluding statement, the CBA and RIA conducted by USDA fails the most basic tests for economic rigor and have certainly not illustrated a maximization of net benefits, nor that benefits would outweigh the extremely expensive costs of exempting the Tongass from the Roadless Rule.

The concluding paragraph in the Agency Costs section states:

> "Cost savings from improved flexibility for the agency and timber industry would accrue alongside other benefits, displayed in Table 5 and discussed above; including reduced cost for leasable mineral availability, renewable energy development potential, potential for development of state roads and other transportation projects, and benefits to Alaska native customary and traditional uses." (RIA: 45).

No essential energy or transportation projects have been stopped by the Tongass Roadless Rule. Other purported benefits are also red herrings. As stated above, these "cost savings" are never divulged because they won't actually occur. Expanding the Tongass timber footprint into roadless areas will universally increase all agency costs. Other presumed benefits in this statement are questionable to say the least. It is difficult to even understand what is meant by "reduced cost for leasable mineral availability?" Regardless, the Environmental Effects analysis shows that there are no leasable minerals on the Tongasss (DEIS: 3-155). So how will non-existent costs be reduced?

As shown in the previous section, the agency costs for Tongass timber are already out of control and will escalate under the preferred Alternative (6). Alaska USFS already has a road management backlog estimated at $68 million.[39] Part of the annual Tongass timber agency costs, and miniscule benefits, are acknowledged in the RIA:

> "On average, the Forest Service spent approximately $12.5 million per year to administer Tongass timber sales from 2005-2014, excluding road building costs, and received approximately $1.1 million in revenue per year (GAO 2016)." (RIA: 38)

However, none of the increased road costs that will occur under the proposed rule are presented in the Agency Costs section. At a minimum, per mile road construction, decommissioning, and maintenance costs for the Tongass must be presented in a revised DEIS. Furthermore, USDA must address current road maintenance backlogs in the Tongass, necessary culvert replacements, and watershed restoration needs and estimate current costs. Also not reported in the Agency Costs section, is the estimated $5 million dollar price tag for conducting this rulemaking, much of which has gone to the State of Alaska and to the Alaska timber industry lobby group (Alaska Forest Association).[40] With no rational purpose or need, and without verifying any of the state's claims of economic harm, this rulemaking should have never been initiated and is a large waste of taxpayer dollars. Excessive agency spending will be required if the Tongass is exempted from the Roadless rule. How are these myriad costs not acknowledged in the Agency Cost section?

4.5 The Distributional Effects Show the Preferred Rule will Have Zero Impact on Regional Employment

If the proposed rule is "intended to provide for economic development opportunities in Southeast Alaska" (RIA: 45), then surely the DEIS and RIA would contain economic analysis showing how the rule would increase economic activity and increase regional employment. However, the RIA and the Distributional Effects section does not project any increased economic activity or employment from the proposed rule. This is the case even for the timber industry: "Thus no change in timber related employment or income is expected as a result of the proposed rule or other regulatory alternatives." (RIA: 40)

The primary component of distributional effects used in the NEPA process for public lands rulemaking is economic impact analysis. Economic impact analysis, also known as economic contribution analysis, measures the resulting market impacts associated with a change in regional final demand resulting from a changed land policy. Economic impacts are part of distributional effects because they represent shifts in regional wealth. This shift in final demand results in distributional effects that have a greater impact on industries favored by the rulemaking.

That the Distributional Effects section of the RIA shows zero changes in market impacts or regional employment is clear evidence that the entire purpose and need for this rulemaking is not legitimate. Rhetoric and propaganda from Alaska politicians and the current Administration hold no water. For example, Alaska Governor Michael Dunleavy stated on November 20th that, "Exempting the Tongass from the Roadless Rule will create new jobs and economic activity in a region hit hard by the misguided

[39] USFS responses to Rep. Mike Quigley.
[40] "Congressional Democrats ask for investigation into Alaska use of forest grant." Alaska Daily News, 12/1/19.

policies of a previous administration."[41] Apparently Gov. Dunleavy and his staff have not read the DEIS and the Distributional Effects section in the RIA, where it is clearly divulged that there will be NO new jobs and NO new economic activity spurred by the proposed rule.

5. An Ecosystem Service Valuation for Tongass Roadless Areas

When viewed through an ecosystem services lens, it becomes abundantly clear that exempting the Tongass from the Roadless Rule will damage all other aspects of the Southeast Alaska economy in order to prop up the timber industry. Ecosystem services broadly represent nature's benefits to humans and can be classified into regulating, supporting, provisioning, and cultural. Expanding the Tongass timber harvesting woodshed by increasing the suitable timber base will have adverse environmental consequences on a bevy of ecosystem services currently protected by the Roadless Rule. Because the DEIS does not include an ecosystem service perspective and has failed to even qualitatively describe the full environmental consequences from removing the Tongass Roadless Rule, despite explicit flagging of these economic issues in the scoping process, the DEIS must be withdrawn and a new one must be produced.

Even if one were to accept USDA's insistence that Tongass harvest levels will not increase with the removal of the Roadless Rule, as stated numerous times in the DEIS, the Tongass timber footprint will greatly expand. The habitat fragmentation, sediment alterations, and stream damage from new incursions into Tongass roadless areas will come at a steep price. Unfortunately, secondary data is often missing for quantifying natural resource damages incurred due to expanding the timber footprint into Tongass roadless areas. These resource damages stemming from timber development include reduced water quality, loss of wildlife habitat, and increased carbon emissions. Despite not having easily transferable quantified economic values for damages to ecosystem services, adverse effects from timber production need to be included in a revised DEIS.

A review of the scientific literature paints a very clear picture: Tongass roadless forests provide much greater economic value than the logged over forests. Developing roadless forests for clearcutting of Tongass old growth has been shown to have adverse effects on critical regulating and supporting ecosystem services by increasing erosion[42] and sedimentation of salmon streams.[43] Tongass timber harvests alter hydrologic processes through erosion[44] and reduce large woody debris recruitment to streams resulting in degraded salmon habitat.[45] Road construction needed to access timber also limits

[41] *Ibid*.
[42] Kahklen, K and W. Hartsog. 1998. Results of road erosion studies on the Tongass National Forest. Unpublished report for USDA Forest Service, Juneau Forestry Sciences Laboratory. 47p.
[43] Tiegs, S., D. Chaloner, P. Levi, J. Ruegg, J. Tank, and G. Lambert. 2008. Timber harvest transforms ecological roles of salmon in southeast Alaska rainforest streams. Ecological Applications 18(1): 4-11.
[44] Gomi, T, R. Sidle, and D. Swanston. 2004. Hydrogeomorphic linkages of sediment transport in headwater streams, Maybeso Experimental Forest, southeast Alaska. Hydrological Processes 18: 667-683.
[45] Heifetz, J., M. Murphy, and K. Koski. 1986. Effects of logging on winter habitat of juvenile salmonids in Alaskan streams. North American Journal of Fisheries Management 6(1): 52-58.

fish passage due to perched culverts.[46] Edges of Tongass clearcuts lose wind firmness, increasing blow down near harvest sites and leading to unraveling of stream buffers.[47]

These adverse effects on regulating and supporting Tongass ecosystem services associated with opening up roadless forests for development will have cascading effects on all biodiversity, particularly salmon. Ultimately, developing Tongass roadless areas will result in fewer salmon for recreational fishing, guided sport fishing, subsistence fishing, and commercial fisheries. This will, in turn, negatively affect economic activities and employment in industries that are much more important to Southeast Alaska than the timber industry. These are the economic trade-offs that must be analyzed and acknowledged in a revised DEIS.

The damage to streams and rivers is just part of the ecosystem service degradation legacy left by Tongass logging. Clearcutting Tongass old growth is also very problematic for forest structure and wildlife habitat. Due to extended decades of stem exclusion phases after clearcut regeneration, Tongass second growth becomes a liability to wildlife dependent on understory forbs and plants. This is particularly problematic for Sitka black-tailed deer,[48] but has cascading adverse effects on wolves and biological regulation functions of the forest.[49] Overstory bird species, such as goshawks and murrelets, also face declining habitat whenever Tongass old growth is clearcut.[50]

Tongass roadless forests represent vast carbon reservoirs. If these forests are opened to timber harvest, carbon will be released contributing to increased climate change. Since Tongass old growth forests have been estimated to contain about eight percent of the coterminous U.S.' carbon stocks[51] and some of the last old growth temperate rainforest in the world,[52] the Tongass also holds tremendous global value and is a critical component in helping mitigate climate change. Using international carbon markets,

[46] Dunlap, R. 1997. Summary of the 1997 Fish Habitat Risk Assessment Panel, Tongass National Forest, Juneau, Alaska. May 7, 1997.
[47] Harris, A. 1999. Wind in the forests of southeast Alaska and guides for reducing damage. Gen. Tech. Rep. PNW-GTR-244. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 63 p.
[48] Schoen, J., M. Kirchhoff, and M. Thomas. 1985. Seasonal distribution and habitat use by sitka blacktailed deer in southeastern Alaska. Division of Game, Alaska Department of Fish and Game, Juneau, AK; Mazza, R. 2003. Hunter demand for deer on Prince of Wales Island, Alaska: an analysis of influencing factors. Gen. Tech. Rep. PNW-GTR-581. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 21 p.
[49] Person, D., C. Darimont, P. Paquet, and R. Bowyer. 2001. Succesion debt: effects of clear-cut logging on wolf-deer predator-prey dynamics in coastal British Columbia and Southeast Alaska. Paper presented at Canid Biology and Conservation: An International Conference. Oxford University.
[50] Flatten, C., K. Titus, and R. Lowell. 2001. Northern goshawk population monitoring, population ecology and diet on the Tongass National Forest. Alaska Department of Fish and Game. Juneau, AK; Cotter, P. and M. Kirchoff. 2007. Marbled Murrelet. In J. Schoen and E. Dovichin, eds. 2007. The coastal forests and mountain ecoregion of southeastern Alaska and the Tongass National Forest. Audubon Alaska and The Nature Conservancy, Anchorage, Alaska.
[51] Leighty, W., S. Hamburg, and J. Caouette. 2006. Effects of management on carbon sequestration in forest biomass in southeast Alaska. Ecosystems 9: 1051-1065.
[52] DellaSala, D. A., Moola, F., Alaback, P., Paquet, P. C., Schoen, J. W., & Noss, R. F. (2011). Temperate and boreal rainforests of the Pacific Coast of North America. In *Temperate and boreal rainforests of the world: ecology and conservation* (pp. 42-81). Island Press, Washington, DC.

researchers have estimated a market value of $3 to $7 million a year for stopping Tongass old growth harvesting.[53]

5.1 Ecosystem Service Damage from Roadless Timber Development Adversely Impacts the Regional Economy

Resource damage from pursuing Tongass timber production in roadless areas manifests in various economic forms and leaves a natural capital debt for future generations. Reduced black-tailed deer populations and reduced salmon have a direct economic effect on Southeast Alaska's largest private sector industries of tourism and seafood production. Subsistence activities, which comprise a large share of many Alaska residents' annual food budgets, are also degraded by reducing the number of animals for harvest and increasing the time and resources needed to fill the freezer. These resource damages cause economic harm to residents. The natural resource damages must be accounted for in the rulemaking process and must be countered with mitigation efforts.

For example, the latest economic impacts assessment for Tongass recreation shows that recreational visits are increasing and are at almost three million visits per year.[54] Visitors spend money in Tongass gateway communities for transportation services, food, gear, and lodging. In total, Tongass visitor expenditures are estimated at about $400 million annually, resulting in over $100 million in personal income for Southeast Alaska residents. Tongass recreational expenditures support approximately 4,000 direct local jobs, and over 5,000 jobs when including multiplier effects.[55]

The primary appeal for recreating on the Tongass is to enjoy its wildness and ecologically intact attributes that result in abundant native fish and wildlife. Sport fishing and hunting adventures in Southeast Alaska are considered to be "bucket list" trips for avid fisherman and hunters. Wildlife viewing and the ability to view unspoiled old growth forests, glaciers, and mountains spur numerous cruise ship passengers and do-it-yourselfers to pay substantial money to visit the Tongass.

The pristine nature of the Tongass *is* its comparative economic advantage for attracting tourists and recreationists from the Lower 48. If Tongass roadless areas are opened up for greater road building and clearcutting, this comparative advantage is decreased and will diminish the attractiveness of the Tongass for recreation. Are a handful of new subsidized logging jobs worth damaging the vibrant recreation industry on the Tongass? Are a handful of subsidized sawmill jobs worth damaging the vibrant commercial and sport fisheries associated with the Tongass? Economic theory indicates the answer is a resounding no.

[53] Leighty, W., S. Hamburg, and J. Caouette. 2006. Effects of management on carbon sequestration in forest biomass in southeast Alaska. Ecosystems 9: 1051-1065.
[54] USDA. 2017. Economic effects of national forest recreation in Alaska. Alaska Region Briefing Paper, March 2017.
[55] *Ibid.*