Woodwell Climate Research Center

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To: USDA Forest Service February 24, 2025

Re: Comments on the Tongass National Forest Land Management Plan Revision #64039

The Tongass National Forest (TNF) is the largest in the National Forest system managed by the USDA Forest Service (FS), contains one of the largest expanses of temperate rainforest in the world, and has the largest area of old-growth forest in the National Forest System. It is truly a remarkable ecosystem that must be carefully managed to protect its many values such as wildlife habitat, recreation, climate mitigation potential, and biological diversity. The Woodwell Climate Research Center (Woodwell) welcomes the opportunity to comment on the draft assessment, which will provide important context for a new forest plan, and establish the state of the science regarding the TNF's ecosystem function, resource use, and climate change. Woodwell has recently published peer-reviewed research papers and commentaries on climate, the carbon cycle, and management approaches to protect and enhance carbon stocks and biodiversity. Some of these studies are specific to the TNF. Our comments focus on two sections with the intent to improve the depiction of "best available science": terrestrial ecosystem and carbon stocks, although the comments are relevant to other sections as well.

Terrestrial Ecosystems

This assessment is relatively well written with an emphasis on "ecological integrity" as a means to ensure continued provision of ecosystem services and multiple uses, following guidance from the FS 2012 Planning Rule. Public input to date has highlighted concerns about development, pollution and climate change impacting fisheries and watersheds, among other concerns. In reviewing this assessment, some sections apparently failed to consider the most recent peer-reviewed literature, and so comments are focused on suggestions for including the findings of additional studies at various places in the document.

The assessment of ecological integrity is based primarily on the relative impact of stressors such as insect outbreaks and wildfire that occur at significantly higher or lower rates or severities than occurred historically. This approach assumes that ecosystems that have not been subject to natural disturbances have high ecological integrity, but this inappropriately blames natural disturbances for declines in ecological integrity while ignoring the impact of logging, which has significantly greater impacts, and ignores the differences between logging disturbances and natural disturbances. We request that you describe how ecosystems respond differently to logging and road building vs. natural disturbances like blowdowns, wildfires, insects and disease outbreaks, etc., that in many if not most cases are beneficial ecologically (DellaSala et al. 2022a, 2025).

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Timber harvest is the most significant factor affecting forests on the TNF, though the area harvested has been declining in recent decades according to U.S. Forest Service data (USDA Forest Service 2016, 2024a). We support the recent management plans that reduced harvest of old-growth forest and concentrated timber management and harvesting on young-growth forests, which are mainly forests that were previously harvested over the past few decades and are regrowing. From a climate perspective, it is important to note that timber harvesting releases significant quantities of stored carbon even if accounting for carbon temporarily retained in wood products (Harmon 2019, Hudiburg et al. 2019, Law et al. 2018). It can take decades or even centuries to replace the carbon emitted from harvesting the large, carbon-rich trees in old growth forests. From the perspective of Alaska's arctic and boreal regions, the TNF is among the critical areas that are functioning as net carbon sinks, which are compensating for increasing carbon emissions from wildfires and other stressors (Verkkala et al. 2025). The draft assessment should clearly document, based on this most recent research, the significant role of the TNF in moderating regional emissions by protecting the mature and old-growth forests from increased timber harvest. In particular, the prohibition of removing trees for commercial harvest in designated roadless areas should be strengthened in order to protect this valuable function while maintaining the ecological integrity of these areas.

We support the trend towards less harvesting of well-drained forests that have been the target of significant harvesting in the past. As stated in the assessment, active management of young forests has very little effect on the ecosystem integrity of the re-growing forests. In contrast, there is a nearly instant reduction of ecosystem integrity upon harvest. Generally, in Tongass ecosystems that are rarely affected by significant or severe natural disturbances, high levels of ecosystem integrity can be sustained indefinitely without active management (Rogers et al. 2022). These topics are treated reasonably well in the draft assessment, and we encourage the revision to avoid weakening the rationale for further reduction in the volume of wood harvested.

Carbon Stocks

Carbon stocks on the TNF are the highest among all National Forests, totaling about 10 percent of the carbon on National Forest System (NFS) lands (Heath et al. 2011, Law et al. 2022). The Tongass is a carbon reservoir of national strategic significance (DellaSala et al. 2022b, Law et al. 2022, D'Amore 2020). Much of this carbon is stored in mature and old-growth forests of 150 years age or more, which occupy around three quarters of the forest area (Birdsey et al. 2019), and have a very high average carbon density of more than 300 mg/ha according to the draft assessment.

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The studies described in the draft assessment agree that the TNF is a net sink for carbon because it absorbs more carbon from the atmosphere than it releases, in large part due to the low occurrence of natural disturbances and low logging levels. Undisturbed forests in cool temperate ecozones have slow decomposition rates leading to an accumulation of carbon in woody debris and soils (D'Amore and McGuire 2020). The Forest also has a relatively small area that has been harvested, which emits significant carbon per hectare of logging (Harmon 2019, Hudiberg et al. 2019).

The section "Factors Influencing Potential Future Carbon Dynamics" fails to consider the main disturbance: harvesting. Harvesting is the most significant disturbance by far according to FS data presented in the draft assessment and Birdsey et al. (2019). The emissions from harvesting forests are far greater than the amount of C that is temporarily stored in harvested wood products (HWP; DellaSala et al. 2022a, Harmon 2019, Hudiberg et al. 2019). The draft assessment only mentions the amount of C in HWP, and ignores the more significant emissions from roundwood processing, the large quantity of logging residue left behind to decompose, and from loss of C stored on the forest floor and in disturbed soils. This is a significant accounting omission that should be corrected in the final draft.

There is a large body of literature highlighting options for managing forests to maintain or increase carbon stocks. Most peer-reviewed studies conclude that it is more effective to let forests grow without management interventions or harvesting (Birdsey et al. 2023, Cook-Patton et al. 2021, Law et al. 2018, Moomaw et al. 2019). These studies indicate that it would take decades to centuries to restore the carbon stocks lost to harvesting live trees – particularly large trees -- even if fully accounting for the temporary storage of C in HWP, which is far less than the emissions. Although threats from wildfire and insects must be considered, especially in ecosystems that have short disturbance return intervals, the probability of natural disturbance in an area such as the Tongass with very high annual rainfall and high productivity is extremely low and therefore not a significant factor in the ability to protect future C stocks.

Areas with low levels of natural disturbance are highly valuable as strategic C reserves, and help to compensate for areas that are trending toward increasing emissions from warming and natural disturbances (Law et al. 2022). The currently protected and persistent C sink in the Tongass is notable among terrestrial forest areas that help prevent arctic and boreal regions of North America from becoming net sources of stored C as the permafrost areas trend toward becoming sources of C (See et al. 2024, Virkkala et al. 2025). As described in the terrestrial ecosystem assessment, the draft carbon assessment should clearly document the significant role of rainforests such as the Tongass in moderating regional emissions by protecting the mature and old-growth forests from increased timber harvest (DellaSala et al. 2022b). We

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recommend strengthening the protection of trees from commercial harvest in designated roadless areas in order to protect this valuable function as well as maintaining the ecological integrity of these areas.

Projections of increasing future timber demand combined with increasing tariffs on softwood imports are likely to increase pressure to harvest more timber from National Forests, including from mature and old-growth forests of the TNF, to help offset anticipated timber price increases in the U.S. (USDA Forest Service 2016, 2024b, Buongiorno 2018). Because of the exceptional value of the TNF as a strategic carbon reserve, its mature and old-growth forests should be more strongly protected. To address increasing timber demand and prices, improving management and productivity, and increasing harvest on private timberlands, would more effectively sustain commercial timber production while protecting strategic carbon reserves on public forest lands (Hoover and Heath 2011, Vasievich and Alig 1996).

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Sincerely,

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