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Comments: October 30, 2025

To: Johanna Kovarik, Gifford Pinchot National Forest Supervisor

Subject: Spirit Lake Outflow Safety Improvement Project - Draft Environmental Impact Statement (PALS Project #66482)

Dear Johanna Kovarik:

Thank you for the opportunity to comment on the Draft Environmental Impact Statement (DEIS) for the Spirit Lake Outflow Safety Improvement Project. I offer this review as a scientist who has worked on Spirit Lake for over 20 years, and as a professor with over 30 years' experience working on lakes throughout the United States. I have engineering degrees from the Massachusetts Institute of Technology and Brown University. I have written peer-reviewed journal articles on the chemistry and ecological integrity of Spirit Lake and have been invited to present on Spirit Lake at numerous professional conferences.

I am writing to object to the DEIS. Every alternative presents flawed approaches that miss reasonably available solutions that would avoid catastrophic damage to Spirit Lake, provide flood protection, and minimize costs. Furthermore, both preferred alternatives are completely deficient as presented.

Alternatives fail to include reasonable alternatives that exist

A DEIS must include reasonable alternatives that avoid, reduce, or mitigate impacts from the proposed activities while meeting project objectives. This is a fatal flaw of the DEIS because it does not include all existing road possibilities or combinations of strategies in existing alternatives that would meet project objectives at lower cost without undo impact on research, recreation, or the environment. USFS must revise the DEIS to include more reasonable alternatives that meet the objectives of flood control while protecting the unique ecological integrity of Spirit Lake and minimizing costs as well as impacts to research and recreation.

Preferred alternatives would require a 40-foot permanent drawdown of the lake that would destroy the ecological integrity of the lake and jeopardize salmonid habitat

Both current preferred alternatives fail to consider that a 40 foot drawdown of Spirit Lake constitutes a major environmental impact that can be avoided entirely. This is an egregious omission in the DEIS and cause for reconsideration.

A 40 foot drawdown will negatively impact circulation in the lake by creating a new embayment on the eastern side, creating new and larger islands in the middle of the lake, and shallowing the connection between the east and west basins significantly. Changing circulation will impact habitat suitability and connectivity in the system and it will change nutrient dynamics and ecosystem productivity.

The shallower lake created by the drawdown will increase temperatures in the lake. Lakes with larger surface area to volume ratios are warmer because of greater light penetration relative to the depth. Warmer waters would jeopardize usability of otherwise suitable salmonid habitat while conversely proliferating invasive New Zealand mud snails, accelerating their spread to adjacent waters and increasing their impact on the Spirit Lake aquatic food web.

The shallower, warmer lake will increase bacterial metabolic activity in lake sediments, resulting in hypoxia in the bottom waters, making deeper, cooler waters unsuitable for salmonids.

Lowering Spirit Lake by 40 feet will completely de-water Duck Bay, one of the most productive aquatic areas of the lake that serves as habitat for fish and wildlife.

Lowering the lake level will extend the southern shoreline almost 0.5 km northward. This will create a large swath of unstable, un-vegetated new stream sediment bed, which will prevent fish from moving upstream into the tributaries to spawn, as was the case before revegetation stabilized stream channels 30 years after the eruption.

Lowering the lake level by 40 feet will also dramatically draw down the water table in the Pumice Plain. This will significantly change stream hydrology and subsurface water availability for vegetation, resulting in drying of streambeds and a significant dieback of terrestrial plants.

Alternative 7 would create a new connection for fish passage into Spirit Lake (which was lost to natural processes during the eruption), but conversely a 40 foot lake drawdown would provide a smaller, shallower, and much degraded habitat less suitable for reintroduced salmonids. This would defeat the purpose of allowing fish to return to the lake in the first place.

The DEIS contains no real consideration of the environmental impacts resulting from a 40 foot lake drawdown. Furthermore, the benefits of reducing the hydraulic head on the tunnel and debris deposit materials could be provided by other geotechnical engineering solutions, yet none were considered. A DEIS must balance environmental impacts with project objectives. The lack of consideration of the very real environmental impacts to the lake from the preferred alternatives is a fatal flaw in the DEIS.

Solutions exist that would combine elements of alternatives, reducing costs and protecting environmental integrity

A far less expensive alternative would be a modification of Alternative 2, which would rehabilitate the existing tunnel without a permanent drawdown of Spirit Lake. Alternative 2 does not require permanent lake drawdown to rehabilitate the existing tunnel, and the lake level today has sufficient capacity to address possible storm loading (as it has without full tunnel flow capacity up to today). This is also one of the least expensive alternatives.

The DEIS is also completely deficient in not including EXISTING access road alternatives that create less disturbance across the Pumice Plain. A Utility Terrain Vehicle (UTV) track was already established by the USFS from the end of the 99 road extension (researcher's parking lot) directly to Spirit Lake. This route does not cross any research plots, creates minimal visual degradation for visitors, and requires less maintenance than any of the alternatives given. The existing path could easily be engineered to allow heavy equipment access to a staging area in Duck Bay, which has more than enough depth for barges and other boats in the absence of lake drawdown. This route would also impact only one stream channel (which is dry much of the year) rather than disrupting all the stream catchments across the Pumice Plain. Thus, much of the "unavoidable environmental impacts" could be avoided.

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In closing, the DEIS lacks any alternative that rehabilitates the tunnel completely, relies on existing lake storage capacity for redundancy, and accesses the lake through the existing UTV track. This is a fatal flaw that must be corrected before the project progresses.

As an expert on Spirit Lake, I do not support any of the 9 alternatives as presented in the DEIS. Solutions exist that protect the integrity of Spirit Lake while accomplishing the objective of flood control while keeping costs low. USFS must revise the DEIS to include pragmatic and available solutions that were wholly absent from this current version.

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