

Thank you for the opportunity to provide testimony. My name is Dr. Emily Fairfax, and I am an assistant professor of environmental science and resource management at California State University Channel Islands. I am a hydrologist by training, and my research focuses on the landscape-scale impacts of beaver damming in the American West.

Through my research, I have observed and quantified the ability for beaver dams to protect riparian corridors from both droughts and wildfires.

I have collected data showing that the plants in beaver-dammed riparian zones on ranch-land in Northern Nevada **were twice as productive** as the plants in nearby riparian zones without beaver, and **were not sensitive to either short-term or multi-year droughts** - they stayed green and lush despite going months without rain, year after year.

Riparian zones in general contain a lot of plant biomass, and if those plants run out of water then all that biomass withers and turns into fuel. **By keeping plants green, even during drought, beavers can create fire-resistant patches in the landscape that can act as a refuge** for fish and frogs and birds and grazers - both wild and domestic, during the fires. My data indicates that **riparian corridors with beaver are three times less affected by wildfires than riparian corridors without beaver.**

Drought and fire resistance are only a small portion of numerous ecosystem services active beavers provide in a landscape. Recent research in my field has put a dollar value on those ecosystem services, which include drought, fire, and flood mitigation; non-consumptive recreation; biodiversity and habitat creation - particularly for fish and waterfowl; water purification; water supply; and greenhouse gas sequestration amongst others. **For every square mile of beaver-dammed riparian zone, it is estimated that the beavers are doing up to \$179,000/year worth of ecosystem services.** Oregon has roughly 14,250 square miles of riparian area. **If that were fully occupied by beaver, the state would be receiving up to an estimated \$2.5 billion dollars in ecosystem services from the beavers.** Even if that were only 10% occupied by beaver, the state would still be receiving \$250 million dollars each year in ecosystem services.

The exact number of beaver in the state of Oregon is unknown, though my research suggests that it is far below its capacity. Being able to count and track beaver population dynamics over time is critical for managing them as a tool for landscape resilience. Beavers have a lot of potential to improve the landscape in Oregon, if properly managed.

The bottom line is that Oregon needs more beavers in its riparian zones if it wants to reap the drought and fire mitigation benefits of this keystone species. Requiring permits for lethal management is one way to track where and when beaver (and their impacts) are lost from the landscape over time, and is currently in practice in other states. At a minimum these permits would provide data on the scale of beaver ecosystem services being lost annually. Ideally it would encourage landowners to consider coexistence options while keeping lethal management as a backup plan.

References:

Fairfax, E., & Small, E. E. (2018). Using remote sensing to assess the impact of beaver damming on riparian evapotranspiration in an arid landscape. *Ecohydrology*, 11(7), e1993.

Fairfax, E., & Whittle, A. (2020). Smokey the Beaver: beaver-dammed riparian corridors stay green during wildfire throughout the western United States. *Ecological Applications*, 30(8), e02225.

Thompson, S., Vehkaoja, M., Pellikka, J., & Nummi, P. (2021). Ecosystem services provided by beavers *Castor* spp. *Mammal Review*, 51(1), 25-39.