

How Beavers Help Improve Our Climate Change Readiness and Fish and Wildlife Survival

Frequently Asked Questions

How do beavers and beaver habitat help with climate change readiness?

Beavers create wetlands and wet meadows when they build and maintain dams to create the ponds and habitat they need to survive and thrive. These wetlands and wet meadows are natural carbon capture-and-storage (CCS) areas. They remove large amounts of carbon from the atmosphere, via photosynthesis, and store it in roots and decaying matter below ground, in riparian vegetation, and in beaver ponds. Some of the CCS characteristics of newly-created stream corridor wetlands are:

- Can store 3-10 times more carbon in their soils than the same volume of soil under a virgin forest, 6-14 times more than under a secondary forest, and 7-35 times more than under a grassland. The amount varies as a function of the site conditions of the wetland, forest, and grasslands.¹
- Carbon stored in wetlands has a longer residence time (> 1000 years) compared to upland forests (100s of years) -- an important contribution given the long-term challenges and impacts of climate change.²
- Once a minimum of 55% vegetation cover is achieved in a wetland it usually becomes a net carbon sink, with many wetlands achieving this amount of vegetation within two to five years.³

Beaver-created and maintained habitat improves the ability of fish and wildlife to survive climate changes. The ponds, wetlands, and wet meadows temporarily store water and then slowly release it. In the process, they create habitats that are less sensitive to climate variability because they contain reservoirs of surface and groundwater that continue to provide for the needs of fish, wildlife, and plants. This temporary storage and slow release of water helps offset declines in stream flows and water quality related to declining snowpacks, and helps decrease flood magnitudes related to changing rainfall and snowmelt patterns.

How does beaver habitat help with wildfires?

Beaver-created and maintained wetlands, wet meadows, and ponds are natural fire breaks because the water and water-rich vegetation don't burn. The areas provide safe zones for livestock and wildlife to flee to during fires which can make the difference between life and death. They also provide habitat post-fire which is critical for helping wildlife survive the winter. Because vegetation remains, these water-rich areas trap soil eroding from surrounding hillsides post wildfire and prevent it from reaching the streams, helping to protect water quality and fisheries.

How do native fish benefit from abundant beaver and beaver habitat?

Beavers create habitat that improve the function and diversity of the biological and physical systems native fish need to survive and thrive. Ponds provide critical winter-rearing habitat for juvenile Coho salmon. Ponds and wetlands temporarily store surface and groundwater. Deeper surface water and inputs of cooler groundwater help decrease stream temperatures (currently, tens of thousands of miles of Oregon streams are too warm). Improved riparian conditions result in greater vegetation and insect life, which enhances food sources for native fish.

How do farmers and ranchers, and cities and towns benefit from abundant beavers and beaver habitat?

Farmers and ranchers need water during to grow crops and raise livestock. Cities and towns need dependable high-quality water, and drinking water for many Oregonians comes from national forests. Beaver-created habitats



¹ Wohl (2013). Landscape-scale carbon storage associated with beaver dams. *Geophysical Research Letters*, Vol. 40, 1-6; Buringh (1984). Organic Carbon in Soils of the World (chapter 3) in *The Role of Terrestrial Vegetation in the Global Carbon Cycle: Measurement by Remote Sensing*. Edited by G. M. Woodwell. pp. 91-109.

²Valach et al (2021). Productive wetlands restored for carbon sequestration quickly become net CO2 sinks with site-level factors driving uptake variability.

³ Ibid

temporarily store water in ponds and in the ground, which is then slowly and sustainably released. Because the ponds create conditions that allow for regular groundwater recharge, benefits are maintained over time. This temporary storage helps offset impacts of drought and helps maintain higher water quality.

How do you deal with beaver-human conflicts such as blocked culverts?

Most beaver-human conflicts can be solved through co-existence strategies developed using human ingenuity and knowledge about beaver. These strategies eliminate conflicts for the long-term and are more cost-effective than repetitive trapping because removal simply makes the habitat available to another family of beaver—thus compounding potential for infrastructure damage and costs over time.

How many beaver are there in Oregon?

We don't know. Less than historic numbers and not enough based on the abundance of unoccupied, suitable habitat and lack of the habitat they create and maintain that provides a variety of ecosystem services. What we do know is that from 2000-2020 over 51,200 beaver have been killed under the ODFW Furbearer Trapping and Hunting Regulations, 10,051 beaver killed by USDA Wildlife Services, and an unknown number killed on private lands.

How valuable is abundant and maintained beaver habitat to Oregonians?

Beaver and beaver habitat provide essential services to human and wild communities for free. The habitat they build and maintain enhances fishing, hunting, and wildlife viewing, creates natural fire breaks, increases water quality and stream flows, improves and expands salmon rearing habitat, and improves and expands habitat for countless other wildlife and aquatic species. A 2009 report commissioned by ODFW and Travel Oregon found that the economic returns of fishing, hunting, wildlife viewing, and shellfishing alone were \$2.8 billion. In addition, a 2016 report commissioned by the state legislature found that the majority of Oregonians are concerned about habitat loss, lack of water, low/declining fish populations, urban sprawl, and conservation and management of resources in general. Abundant and maintained beaver habitat can help with many of these concerns.

What would be the impact of closing Oregon's federally-managed public lands to beaver trapping and hunting?

Oregon has 32.6 million acres of federally-managed public lands (53% of the state). As these public lands are widely distributed, increases in beaver numbers, dams, and habitat on these lands would benefit millions of Oregonians, aquatic species, and wildlife. Benefits include improved water quality and stream flows, improved fish and wildlife habitat and numbers, and expansion of natural fire breaks and wildfire refugia. These changes would help fulfill the Clean Water Act and key Salmon Recovery Recommendations. Benefits would be in the 100s of millions of dollars. Currently, less than 200 people statewide trap and hunt beaver under the ODFW furbearer regulations as a recreational activity on public lands. These individuals would no longer be able to do this activity.

How does beaver trapping and hunting hurt Oregon's climate change readiness and fish and wildlife survival?

Maintaining family units is key for expanding populations, successful dam building and maintenance, dispersal, and habitat creation. Trapping and hunting can eliminate entire colonies in one season. As a result, when the dams fail, they are not repaired. The ponds drain, water tables drop, water quality declines, stream flows become less predictable, wetlands and wet meadows begin converting to drier species and fish and wildlife habitat decreases. Even if some beaver remain, there is a lag between birth, adulthood, dispersal and finding a mate which limits creation and maintenance of habitat and its benefits. Those that remain are vulnerable to trapping and hunting pressures the following year in addition to other mortality causes.

How does beaver trapping and hunting differ from wild carnivore predation on beaver?

Winter is the beaver breeding and pregnancy season and the time beaver are most safe from wild carnivores due to limited land exposure. This is also the time when ODFW furbearer regulations allow trapping and hunting to occur because the fur quality is best. Once a trap is set a trapper can leave and return at leisure leaving the trap on the landscape 24/7 until removed or an animal is caught. Whole colonies can be removed in a single season leaving dams unattended, which then fall into disrepair and fail, causing habitat benefits to be lost. Wild carnivore predation is an opportunistic kill and unlikely to remove an entire colony. Therefore, the habitat benefits remain because in many cases the remaining beaver are able to maintain their dams and expand their numbers.