

COMMUNITY BENEFITS AND ECONOMIC VALUE OF LOLO PEAK-CARLTON RIDGE ECOSYSTEM: FALL UPDATE 2026

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Natural Capital of Lolo Peak-Carlton Ridge Public Lands

Public lands managed by government agencies provide many economic benefits from visitors who spend money and support local jobs in restaurants, gas stations, motels/hotels, RV campgrounds, vehicle repair, guide services, retail stores, and other businesses. Visitors from outside the local area travel to wildlife and game refuges, fisheries, hunting, and backcountry camping and hiking or to simply experiencing natural surroundings. Public lands also provide income and jobs from timber harvest, mining, and recreation development activities. Proximity to public lands attracts new residents and business into a local community.

Lolo Peak-Carlton Ridge public land with its snowcapped peaks, forested slopes, and biologically diverse wetlands provide a highly diverse natural capital base that benefits all people and communities. Broader community wide benefits from public lands come from nature's endowment of streams, mountains, wildlife, and plants, a natural capital base for providing ecosystem services such as clean water for downstream users, increased resilience to climate change, and clean air. This flow of ecosystem services also contributes to the social, economic, and cultural resilience of local communities.

The Carlton Ridge Natural Research Area is nature's laboratory on plant and animal diversity, climate change, and forest health.

Natural capital provides far reaching, tangible, and diverse services with collective benefits known as ecosystem services. Air filtration, water provision, carbon sequestration, soil quality, flood and storm management, flora and fauna biodiversity, outdoor recreation, regenerative timber supply, and education-research exemplify these kinds of services. Just as other forms of capital can provide a flow of services, natural capital also provides humans with goods and services and natural habitats for animal and plant life.

The flow of services does require appropriate land management protections including fire protection to sustain natural landscapes that are mostly self-regulating and self-renewing. In fact, federal agencies are expected to recognize ecosystem services in their land management decisions (Office of Management and Budget, 2024; USFS, 2023).

The Ecosystem Services Valuation Database

Many ecosystem services are not traded in formal markets and, therefore, do not have readily observable prices. Fortunately, there is available data collected and compiled by conservation practitioners and ecologists that allow for estimated dollar values to ecosystem services. The Ecosystem Services Valuation Database (ESVD; <https://www.esvd.net>) provides robust and accessible information on the economic benefits of ecosystems and biodiversity to support nature

conservation, restoration, and land management decisions. The ESVD was developed with the long-term goal of providing accessible information on the economic benefits of ecosystems and the costs of their loss (Brander et. al. 2025).

Economic values in the EVSD primary studies come from market prices for ecosystem services traded directly in markets, the costs of avoided damage, restoration costs, and the costs people pay or are willing to pay for use, protection, and preservation of natural resources.

Estimating the economic value of nature's benefits epitomizes our modern obsession with quantification of scientific observations. First People and Tribal Communities integrated nature's gifts into their spiritual relationships with land, plants, animals, water, and all things in the natural world without putting numbers on these gifts, a cultural awareness for sustainable stewardship over eons of coexistence with nature.

Ecosystem Services in The Lolo Peak-Carlton Ridge Ecosystem

The Lolo Peak-Carlton Lake public lands are an ecological crown jewel and an important source of the following ecosystem services:

- Air Quality:** Natural vegetation traps particulate matter, especially dust particles, and absorb chemicals that could harm human health.
- Climate Change Mitigation and Carbon Sequestration:** Forests provide shade, retain humidity, store water in foliage and mycorrhizal fungi in subterranean tree root systems, and sequester and store carbon dioxide.
- Water Supply:** Refers to the quantity and accessibility of water and ensuring a continuous, reliable flow of water for human, business, and agricultural needs.
- Water Quality:** Natural landscapes regulate water flow and filter out pollutants by trapping sediment, allowing microbes and other organisms time to break down and trap material from reaching human users.
- Storm Mitigation/ Water Flow/ Flood Protection:** By slowing water down, natural land cover on public lands gives water a chance to infiltrate into soil and recharge groundwater and to be taken up by plants.
- Biodiversity:** Forests include habitat for diverse species that make up food webs and other relationships, provide refugia for migrant and resident species, maintain genetic diversity, and support the wildlife that people use and enjoy directly through hunting, fishing, and observation
- Outdoor Recreation:** Public conservation lands attract visitors and provide spaces for visitors and residents alike to enjoy activities like hiking, camping, fishing, skiing, hunting, and wildlife observation.
- Scenic Value:** Natural areas, whether experienced up close, seen from afar, or even as those experiences are remembered or anticipated, support psychological and emotional benefits for people to be healthier and more productive in their daily lives.

Table 1. Annual Value of Ecosystem Services from the Lolo Peak-Carleton Ridge Ecosystem in \$2025 Dollars

Ecosystem Service	Value per Acre (2025 Dollars)	% of Total Ecosystem Service Value	Valuation Method
Air Quality	\$444	17%	Damage Cost
Climate Change Mitigation and Carbon Sequestration	\$195	8%	Market Prices & Social Cost of Carbon
Water Supply	\$307	12%	Market Prices
Water Quality	\$448	17%	Market Prices & Damage Costs
Storm Mitigation/ Water Flow / Flood Protection	\$337	13%	Damage Costs
Biodiversity	\$116	4%	Protection Costs & Willingness to Pay
Outdoor Recreation	\$507	20%	Market Prices & Travel Costs
Esthetic Value of Scenic View	\$232	9%	Willingness to Pay & Travel Costs
Total Annual Ecosystem Service Value Per Acre	\$2,586	100%	
Source : Esvd.net, Brander et. al. 2025*			

The \$2,586 per acre total ecosystem services for the thousands of public land acres in the Lolo Peak-Carleton Lake ecosystem provide important and basic benefits to surrounding communities. Air and water filtration along with climate and storm mitigation are irreplaceable public goods for community health and resiliency.

All the ecosystem services listed in the table provide a direct connection between Lolo Peak-Carlton Ridge's natural landscape and people in local communities. Annual conservation investment and maintenance support costs are low in comparison to the benefits and are dependent on wise land management decisions by the agencies managing these lands.

Not all acres are equally productive in ecosystem service provision. There are variations in ecological integrity or productivity because of roads, wildfire, and forested areas recovering from fire, disease, noxious weed infestation, and other biological threats.

Ecosystem services improve public health and provide a hospitable environment at the local and regional level. Water flow and flood regulation from streams, lakes, and wetlands on Lolo Peak-

Carlton Ridge's public lands can offset damage from extreme storms events such as the increasingly common atmospheric river rain in the Pacific Northwest and Northern Rockies.

These different human and community-wide benefits contribute to the resilience of local communities in maintaining social, economic, and environmental sustainability over time. The streams, lakes, and wetlands in The Lolo Peak-Carleton Lake provide fresh water to the Lolo Creek and the Bitterroot River.

The land within the Lolo Peak-Carleton Lake offers a prime example of high-capacity ecosystem service lands based on the conservative, minimum bound estimates in Table 1. The annual value of services will flow for a long time if the land continues to receive conservation protection and monitoring. Removing protection on this land reduces its stock of natural capital and thereby reduces the annual ecosystem service value that flows to local communities and the region.

Economic Value of Research Natural Areas

Aldo Leopold wrote in "Wilderness" that natural areas provide the "base datum of normality" by which we can judge the quality of more active or intensive land management (Leopold 1990). Scientific research on well-functioning ecosystems helps us understand that "base datum" and improves our stewardship of managed woodlands, farms, and other areas (Arno, 2018).

Conservation Investment and Maintenance of the Natural Capital Base

Protected natural landscapes have tremendous regenerative capacity but do require on-going conservation investment and restoration work to maintain the viability of their natural capital. Threats to this natural asset, ranging from overuse of natural landscapes from all forms of outdoor recreation, motorized encroachment on wildlife habitats, and pollution threats to clean air and water will reduce ecosystem services qualitatively and quantitatively.

* The focus of the ESVD is to gather information on economic values related to ecosystem services measured in monetary based on 12,390 value records from over 1,300 primary, or original, studies distributed across all biomes, ecosystem services, and geographic regions. Filters applied to the data in Table 1 included: a) studies and their data were restricted to North America and Europe; b) the study areas were not managed for timber, crop, or other commodity production; c) mean values were used; and d) partially protected temperate forest and woodland biomes were analyzed.

Brander, L.M., et. al. Ecosystem Services Valuation Database (ESVD). Foundation for Sustainable Development and Environmental Economics. 2025. <https://www.esvd.net>.

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