HOW WE DO IT: Riparian Buffers

Forests supply almost 60 percent[1] of the nation's drinking water and provide habitat for a wide range of terrestrial and aquatic species. To make sure our harvesting operations do not endanger soil health, water quality or biodiversity, we take special care to leave buffers around aquatic ecosystems, including streams and wetlands. We follow regulations and Best Management Practices (BMPs) developed through years of research and partnerships, and we have high confidence that the riparian buffers we leave on our lands are protective of sensitive ecosystems and species across North America, including salmon in Oregon and Washington.

KEY POINTS

- The development of riparian buffer rules or state-approved BMPs in the United States is the responsibility of each state, and buffer types and widths are typically developed in cooperation with state and federal agencies, landowners and other stakeholders. Most state forestry agencies conduct monitoring and in some cases research to evaluate the effectiveness of riparian and water protection rules established under the U.S. Clean Water Act. The results of this periodic monitoring and research then help forestry agencies or state forestry boards and commissions improve best practices as needed.
- In Oregon and Washington, buffer width requirements are studied and updated through science-based, regulatory, adaptive management programs.
- In other regions of the U.S., riparian buffers are implemented under state-approved BMPs, with very high implementation rates.[2] These practices protect water quality, and state water quality agencies have regulatory authority associated with violations of their water quality standards.[3]
- In addition to state monitoring and compliance programs, Weyerhaeuser conducts internal and third-party audits to ensure we implement buffer requirements according to laws and our internal policies.
- Determining effective buffer widths involves careful consideration of how different riparian functions — such as shade, sediment and wood delivery — occur at different distances from the stream edge. Litterfall and bank stability, for instance, can be addressed with a relatively narrow buffer; shade and wood input occur from a greater distance. Through years of research and experience, the buffer widths we leave capture the majority of these functional interactions between riparian areas and streams.[4]
- We also prevent sediment from entering streams and other waterways by using well-designed culverts, bridges and roads, as well as limiting equipment entry near streams. Careful planning, ongoing maintenance and inspections, and use of water diversion structures on roads are the best approaches to protect water quality. Building new roads, or the continual use of improperly designed roads — especially those leading to stream crossings — can be a leading cause of soil disturbance and sediment reaching rivers and streams.[5]

SUPPORTING RESEARCH

- One of the longest-running research projects to understand the efficacy of contemporary forest management practices in protecting water quality occurs in Washington's Deschutes River Watershed. Since 1974, Weyerhaeuser has measured streamflow, sediment, turbidity and water temperatures in the watershed and shown that current riparian buffers and road management practices maintain water quality.

[1] "Mean Annual Renewable Water Supply of the Contiguous United States," Briefing Paper, Rocky Mountain Research Station, Fort Collins, CO (2016)
[2] "Protecting the Nation's Water: State Forestry Agencies and Best Management Practices," *National Association of State Foresters* (2019)
[3] "National Status of State Developed and Implemented Forestry Best Management Practices for Protecting Water Quality in the United States," *Forest Ecology and Management* (2018)
[4] "Effectiveness of Forestry Best Management Practices in the United States: Literature Review," *Forest Ecology and Management* (2016)
[5] "Forestry Best Management Practices and Conservation of Aquatic Systems in the Southeastern United States," *Water* (2021)

- In 2019, as part of a large, collaborative effort involving multiple state and federal agencies and several universities, we completed a long-term water quality study in Oregon's Trask Watershed. That study[6] examined the relationship between water quality criteria — such as sediment, temperature and turbidity — and timber harvest, road construction and log hauling. The research team found that our forest management practices ensure we meet Oregon's state water quality standards.
- The governments of Oregon and Washington have conducted extensive monitoring and research to study forest conditions and expand scientific knowledge. These studies and findings are used by state forestry agencies to implement potential changes to Forest Practices Act rules. A list of technical reports can be obtained directly from the Oregon Department of Forestry and the Washington Department of Natural Resources. Washington also provides guidance through the Forests and Fish law, adopted in 1999, which established the set of scientifically based changes that private landowners, tribal nations, state and federal agencies and other parties supported that would lead to salmon recovery in areas involving forest practices. The parties involved determined that the Forests and Fish laws were sufficient to satisfy the requirements of the ESA and CWA with respect to salmon, aquatic resources and water quality.

FREQUENTLY ASKED QUESTIONS

How do you know your riparian buffers are adequate to preserve water quality and adjacent ecosystems?

Many factors influence buffer effectiveness, and we've carried out several experimental watershed studies to evaluate potential impacts to water quality from forestry practices. Results from these research studies and monitoring indicate that contemporary forest practices have minimal influence on water temperatures and sediment movement. We've studied the impacts of changing forest practices on these parameters for decades, and we continually invest in research related to water quality, biodiversity, forest health and productivity — including more than $11 million in 2025 alone.

Can these strips of habitat really make a difference?

Definitely. Our managed forests provide a wide variety of habitat types, and maintaining riparian buffers is an essential component of our strategy to conserve biodiversity across our timberlands. Riparian buffers help filter water and keep stream temperatures cool during warmer months, which can be critical for certain aquatic species, including salmon, as well as provide downstream benefits for other sensitive species, such as orcas. During rainfall, buffers help prevent sediment from entering streams, and forest buffers also provide a long-term source of large wood to streams. Wood is a key component of habitat formation in streams; in some channels, wood is the primary element responsible for the formation of pools. These protected buffers also support the long-term growth of large, older trees.

Wouldn't expanding these buffers provide even greater ecosystem benefits?

Not necessarily. Understanding buffer width and effectiveness is a complicated issue, and we carefully monitor and research multiple factors, including biological (fish, wildlife) and abiotic (temperatures, sediment delivery) responses to existing best practices. Sometimes narrow buffers provide all the necessary protections for aquatic ecosystems; in other cases, we determine a need to adjust our practices based on new research or technical guidelines. In Oregon, for instance, we increased buffer widths on small- and medium-size fish streams a few years ago, and we've found that our buffers effectively protect soil health, water quality and biodiversity.

Do these buffers do enough to protect salmon spawning grounds?

Absolutely. Forest practice regulations in Oregon and Washington require forest landowners to determine the presence or absence, as well as the distribution, of fish in streams on forested lands. Once these streams have been accurately studied and categorized, we retain riparian buffers of varying widths. Streams with fish present, particularly salmon species, are afforded wider buffers than those without fish present. The buffers also serve to prevent sediment from entering the streams, providing a further measure of protection for fish, especially spawning salmon, which require clean gravels to deposit their eggs.

But doesn't forestry contribute to the decline in orca populations?

No. Three primary factors are considered responsible for the plight of the Puget Sound's Southern Resident orcas: ship traffic and its resultant noise, contaminants in Puget Sound, and food availability. Of those factors, forest management impacts only food availability, and these orcas eat primarily salmon — particularly Chinook salmon. The management measures we employ on our lands to ensure the protection of freshwater spawning and rearing habitat for salmon help provide a vital food source for the whales and can contribute to their recovery.

[6] "Summer stream temperature changes following forest harvest in the headwaters of the Trask River watershed, Oregon Coast Range," *Ecohydrology* (2019)