

Streamflow, Sediment and Organic Matter

Wood loading response to variable length riparian buffers in clearcut basins

Presenter: Reed Ojala-Barbour

Presenter's email and affiliation: reed.ojala-barbour@dfw.wa.gov; Washington State Department of Fish and Wildlife

Additional coauthors: Aimee McIntyre, Timothy Quinn, Marc Hayes; Washington Department of Fish and Wildlife

Wood influences headwater stream channel morphology and hydraulics, storage and transport of sediment and organic matter, habitat formation, and food availability for biotic communities. We evaluated the effect of clearcut timber harvest in headwater stream basins on in-channel wood loading through 8 years post-harvest. We compared basin-wide timber harvest with variable riparian buffer treatments to unharvested reference basins. The three riparian buffer treatment configurations were no riparian buffer, and riparian buffer retentions of at least 50 percent and 100 percent of the stream length. In the two years following harvest, small and large wood loading increased in all riparian buffer treatments, with the greatest increase in small wood in the treatment with no riparian buffer. Harvest resulted in discrete accumulations of in-channel wood especially in the 50 percent and no buffer treatments. In these accumulations, we observed an increase in the proportion of pieces that spanned the channel and contributed to hydraulic roughness, rather than to bank stability or step formation. By eight years following harvest, wood loading in most buffer treatments did not differ significantly from conditions in the reference basins. Overall, riparian buffers reduced harvest-related inputs and were a source of large wood via windthrow. Continued monitoring is needed to determine the persistence of in-channel wood and rates of future wood recruitment to the channel.



A two-sided 50-ft riparian buffer reduced inputs of harvest-related slash and provided a source of large wood recruitment in an evaluation of the effects of clearcut harvest on headwater streams in western Washington.