Title	Citation (APA)	DOI	Full Link	Synopsis	Year	Function	Ability to inform question												Experiment type	site locations/GPS (x/y)	State/provence	Annotated Bibliography
							1	1a	1b	1c	1d	1e	2	3	4	5	6	7				
Discerning responses of down wood and understory vegetation abundance to riparian buffer width and thinning treatments: an equivalence-inequivalence approach	Anderson, P. D., & Meleason, M. A. (2009). Discerning responses of down wood and understory vegetation abundance to riparian buffer width and thinning treatments: an equivalence–inequivalence approach. Canadian Journal of Forest Research, 39(12), 2470-2485.	10.1139/X09-151	http://doi.org/10.1139/X09-151	This study evaluates the effects of buffer width in combination with thinned stands, patch openings, and unthinned stands on LWD and vegetation cover.	2009	LWD, vegetation											X		BACI	Multiple sites	Oregon	Completed
Riparian buffer and density management influences on microclimate of young headwater forests of western Oregon	Anderson, P. D., Larson, D. J., & Chan, S. S. (2007). Riparian buffer and density management influences on microclimate of young headwater forests of western Oregon. Forest Science, 53(2), 254-269.	10.1093/forestscience/53.2.254	https://doi.org/10.1093/forestscience/53.2.254	This study evaluates the effects of forest management on stream shade and stream temperature, testing differences between no harvest and various thinning treatments	2004	SHD											X		BACI	Multiple sites Lat and long listed	Oregon	Completed
Windthrow and recruitment of large woody debris in riparian stands	Bahuguna, D., Mitchell, S. J., & Miquelajauregui, Y. (2010). Windthrow and recruitment of large woody debris in riparian stands. Forest Ecology and Management, 259(10), 2048-2055.	10.1016/j.foreco.2010.02.015	http://doi.org/10.1016/j.foreco.2010.02.015	This study evaluated the effect of riparian buffer width on windthrow and LWD recruitment along nine small streams in a temperate rainforest in coastal British Columbia.	2010	LW								X					ACI	60 km east of Vancouver	British Columbia	Completed
Thinning and in-stream wood recruitment in riparian second growth forests in coastal Oregon and the use of buffers and tree tipping as mitigation	Benda, L. E., Litschert, S. E., Reeves, G., & Pabst, R. (2016). Thinning and in-stream wood recruitment in riparian second growth forests in coastal Oregon and the use of buffers and tree tipping as mitigation. Journal of forestry research, 27(4), 821-836.	10.1007/s11676-015-0173-2	http://doi.org/10.1007/s11676-015-0173-2	Through simulation modeling, this study evaluates the effects of forest management on large woody debris recruitment, testing differences between no harvest thinning treatments, and buffered treatments	2015	LW		X	X										Simulation modelling	Alsea River Basin	Oregon	Completed
Factors influencing litter delivery to streams	Bilby, R. E., & Heffner, J. T. (2016). Factors influencing litter delivery to streams. Forest Ecology and Management, 369, 29–37. https://doi.org/10.1016/j.foreco.2016.03.031	10.1016/j.foreco.2016.03.031	https://doi.org/10.1016/j.foreco.2016.03.031	This study uses a combination of literature and field experiments to determine greatest factors contributing to litter delivery to streams. Focused on D.fir and red alder.	2016	LIT							X						Modeling	Multiple sites, western Cascades and coastal	Washington	Completed
A catchment-scale assessment of stream temperature response to contemporary forest harvesting in the Oregon Coast Range	Bladon, K. D., Cook, N. A., Light, J. T., & Segura, C. (2016). A catchment-scale assessment of stream temperature response to contemporary forest harvesting in the Oregon Coast Range. Forest Ecology and Management, 379, 153-164.	10.1016/j.foreco.2016.08.021	http://doi.org/10.1016/j.foreco.2016.08.021	This study investigates the effects of buffers vs. no buffers on stream temperature.	2016	SHD	X												BACI	44.5°N, 123.9°W	Oregon	Completed
A multicatchment analysis of headwater and downstream temperature effects from contemporary forest harvesting	Bladon, K. D., Segura, C., Cook, N. A., Bywater-Reyes, S., & Reiter, M. (2018). A multicatchment analysis of headwater and downstream temperature effects from contemporary forest harvesting. Hydrological Processes, 32(2), 293-304.	10.1002/hyp.11415	http://doi.org/10.1002/hyp.11415	This study evaluated the effects of a variety of contemporary forest management prescriptions on small, headwater streams. This study also looked into the thermal trasferability of headwater streams to downstream fish-bearing streams following harvest.	2017	SHD													ACI	Alsea, Hinkle, Trask, watersheds	Oregon	Completed
Effects of riparian buffer width on wood loading in headwater streams after repeated forest thinning.	Burton, J. I., Olson, D. H., & Puettmann, K. J. (2016). Effects of riparian buffer width on wood loading in headwater streams after repeated forest thinning. Forest Ecology and Management, 372, 247–257. https://doi.org/10.1016/j.foreco.2016.03.053	10.1016/j.foreco.2016.03.053	https://doi.org/10.1016/j.foreco.2016.03.053	An experimental study of instream wood loading at different buffer widths, basin geomorphologies, and TPA harvests. These experiments were conducted on headwater stream watersheds in western Oregon.	2016	LWD			X							X			BACI	multiple sites, coast and western Cascades	Oregon	Completed
Relative influence of landscape variables and discharge on suspended sediment yields in temperate mountain catchments	Bywater-Reyes, S., Bladon, K. D., & Segura, C. (2018). Relative influence of landscape variables and discharge on suspended sediment yields in temperate mountain catchments. Water Resources Research, 54(7), 5126-5142.	10.1029/2017WR021728	https://doi.org/10.1029/2017WR021728	Western, H.J. andrews watershed study of variability in suspended sediment yield. The results of a mixed effects model showed that watershed slope had the strongest effect of of the fixed effects variable that described physiographic characteristics.	2018	SED							X						Modeling, regression analysis	H.J. Andrews	Oregon	Completed
Geology and geomorphology control suspended sediment yield and modulate increases following timber harvest in temperate headwater streams	Bywater-Reyes, S., Segura, C., & Bladon, K. D. (2017). Geology and geomorphology control suspended sediment yield and modulate increases following timber harvest in temperate headwater streams. *Journal of Hydrology*, *548*, 754-769.	10.1016/j.jhydrol.2017.03.048	http://doi.org/10.1016/j.jhydrol.2017.03.048	This study evaluates the effect of forest mangaement on stream sediment delivery, testing differences between no harvest and harvested treatments	2017	SED	X						X						ACI	Trask watershed	Oregon	Completed
Influence of wildfire and harvest on biomass, carbon pool, and decomposition of large woody debris in forested streams of southern interior British Columbia	Chen, X., Wei, X., & Scherer, R. (2005). Influence of wildfire and harvest on biomass, carbon pool, and decomposition of large woody debris in forested streams of southern interior British Columbia. Forest Ecology and Management, 208(1-3), 101-114.	10.1016/j.foreco.2004.11.018	http://doi.org/10.1016/j.foreco.2004.11.018	This study compares the LWD biomass between (1) riparian forest harvested ~ 10 years ago, (2) riparian forest harvested ~ 30 years ago, (3) riparian forest burned by wildfire ~40 years ago, and (4) undisturbed old-growth riparian forest.	2005	LWD, LIT/NUT													ACI	43°10′N, 79°55′W	British Colubia, Canada	Completed
A watershed scale assessment of in-stream large woody debris patterns in the southern interior of British Columbia	Chen, X., Wei, X., Scherer, R., Luider, C., & Darlington, W. (2006). A watershed scale assessment of in-stream large woody debris patterns in the southern interior of British Columbia. Forest Ecology and Management, 229(1-3), 50-62.	10.1016/j.foreco.2006.03.010	http://doi.org/10.1016/j.foreco.2006.03.010	This study assesses the amount, distribution, dynamics, and function of LWD in forest stream ecosystems and how these characteristics relate to stream order and bank width.	2006	LWD													ACI	43°10′N, 79°55′W	British Colubia, Canada	Completed
Influence of streamside buffers on stream temperature response following clear-cut harvesting in western Oregon	Cole, E., & Newton, M. (2013). Influence of streamside buffers on stream temperature response following clear-cut harvesting in western Oregon. Canadian journal of forest research, 43(11), 993-1005.	10.1139/cjfr-2013-0138	https://cdnsciencepub.com/doi/10.1139/cjfr-2013-0138	This study investigates the effect of 3 different retention buffer prescriptions on stream temperature. The study follows a before/after design. Short-term	2013	SHD													BAI	Corvallis	Oregon	Completed
Watershed Alnus cover alters N:P stoichiometry and intensifies P limitation in subarctic streams	Devotta, D. A., Fraterrigo, J. M., Walsh, P. B., Lowe, S., Sewell, D. K., Schindler, D. E., & Hu, F. S. (2021). Watershed Alnus cover alters N: P stoichiometry and intensifies P limitation in subarctic streams. *Biogeochemistry*, *153* (2), 155-176.	10.1007/s10533-021-00776-w	http://doi.org/10.1007/s10533-021-00776-w	This study investigates the relationship between alder species coverage with nitrogen and phosphorus leaching. Relevant for question 2 of how composition and structure can affect function.	2021	NUT													BACI	Togiak National Wildlife Refuge	Alaska	Completed
Watershed Alnus cover alters N:P stoichiometry and intensifies P limitation in subarctic streams	Devotta, D. A., Fraterrigo, J. M., Walsh, P. B., Lowe, S., Sewell, D. K., Schindler, D. E., & Hu, F. S. (2021). Watershed Alnus cover alters N: P stoichiometry and intensifies P limitation in subarctic streams. *Biogeochemistry*, *153* (2), 155-176.	10.1007/s10533-021-00776-w	http://doi.org/10.1007/s10533-021-00776-w	This study investigates the relationship between alder species coverage with nitrogen and phosphorus leaching. Relevant for question 2 of how composition and structure can affect function.	2021	NUT													BACI	Togiak National Wildlife Refuge	Alaska	Completed
Response of vegetation, shade and stream temperature to debris torrents in two western Oregon watersheds	D'Souza, L. E., Reiter, M., Six, L. J., & Bilby, R. E. (2011). Response of vegetation, shade and stream temperature to debris torrents in two western Oregon watersheds. Forest Ecology and Management, 261(11), 2157-2167.	10.1016/j.foreco.2011.03.015	http://doi.org/10.1016/j.foreco.2011.03.015	This study examines the effects of an extreme storm event on riparian stream temp, shade, and vegetation 8 years after the event.	2011	SHD, other processes													AI	43.22°N, 123.70°W and 44.30°N, 122.63°W	Oregon	Completed
A Regional and Geomorphic Reference for Quantities and Volumes of Instream Wood in Unmanaged Forested Basins of Washington State	Fox, M., & Bolton, S. (2007). A regional and geomorphic reference for quantities and volumes of instream wood in unmanaged forested basins of Washington State. *North American Journal of Fisheries Management*, *27* (1), 342-359.	10.1577/M05-024.1	https://doi.org/10.1577/M05-024.1	This paper is an observational study that categorizes the effects of riparian site geomorphology on LWD recruitment in unmanaged stands. The purpose of this paper is to establish a base value for expected natural LWD loads.	2007	LWD													Descriptive, spatial modeling	multiple sites across WA	Washington	Completed

The influence of lithology on channel geometry and bed sediment organization in mountainous hillslope-coupled streams	Fratkin, M. M., Segura, C., & Bywater-Reyes, S. (2020). The influence of lithology on channel geometry and bed sediment organization in mountainous hillslope-coupled streams. *Earth Surface Processes and Landforms*, *45* (10), 2365-2379.	10.1002/esp.4885	http://doi.org/10.1002/esp.4885	This study compares the differences in sediment flow, grain size, and sheer stress thresholds between streams on basalt vs sandstone parent material.							Correlative analysis	Cummins Creek and Green River Oregon coast	Oregon	Completed
Overstory structure drives fine-scale coupling of understory light and vegetation in two temperate rainforest floodplains	Giesbrecht, I. J., Saunders, S. C., MacKinnon, A., & Lertzman, K. P. (2017). Overstory structure drives fine-scale coupling of understory light and vegetation in two temperate rainforest floodplains. Canadian Journal of Forest Research, 47(9), 1244-1256.	10.1139/cjfr-2016-0466	http://doi.org/10.1139/cjfr-2016-0466	This study examined the structure and function of two temperate rainforest floodplains to help guide conservation and management.	2017						ACI	Kitlope and Carmanah	British Columbia, Canada	Completed
The characteristics of woody debris and sediment distribution in headwater streams, southeastern Alaska	Gomi, T., Sidle, R. C., Bryant, M. D., & Woodsmith, R. D. (2001). The characteristics of woody debris and sediment distribution in headwater streams, southeastern Alaska. *Canadian Journal of Forest Research*, *31* (8), 1386-1399.	10.1139/x01-070	https://doi.org/10.1139/x01-070	This paper investigates LWD recruitment in the short and long-term in 15 headwater streams under 5 different managemnet and disturbance regimes.	2001	LWD, SED					ACI	Maybeso Experimental Forest	Alaska	Completed
Influence of timber harvesting on headwater peak stream temperatures in a northern Idaho watershed	Gravelle, J. A., & Link, T. E. (2007). Influence of timber harvesting on headwater peak stream temperatures in a northern Idaho watershed. Forest Science, 53(2), 189-205.	10.1093/forestscience/53.2.189	https://doi.org/10.1093/forestscience/53.2.189	This study examined the impacts of timber harvest practices on stream temperature and temperature patterns relative to different disturbances and canopy cover	2007	SHD	X				BACI	Mica Creek	Idaho	Completed
Nutrient concentration dynamics in an inland Pacific Northwest watershed before and after timber harvest	Gravelle, J. A., Ice, G., Link, T. E., & Cook, D. L. (2009). Nutrient concentration dynamics in an inland Pacific Northwest watershed before and after timber harvest. *Forest Ecology and Management*, *257* (8), 1663-1675.	10.1016/j.foreco.2009.01.017	http://doi.org/10.1016/j.foreco.2009.01.017	This study inestigated the effects of contemporary forest practices (operations, harvesting etc) on the chemical properties of headwater streams and downstream locations.	2009	NUT, SED	X				BACI	Mica Creek	Idaho	Completed
Streamside Buffers and Large Woody Debris Recruitment: Evaluating the Effectiveness of Watershed Analysis Prescriptions in the Northern Cascades Region	Grizzel, J., M. McGowan, D. Smith, and T. Beechie. 2000. Streamside Buffers and Large Woody Debris Recruitment: Evaluating the Effectiveness of Watershed Analysis Prescriptions in the Northern Cascades Region. TFW Effectiveness Monitoring Report TFW-MAG1-00		https://file.dnr.wa.gov/publications/fp_tfw_mag1_00_003.pdf	This study evaluates the effects of forest management on large woody debris recruitment, testing differences between no harvest treatments and treatments under Washington forest practice rules	2000	LWD					BAI	Multiple North Cascades	Washington	Completed
Response of western Oregon (USA) stream temperatures to contemporary forest management	Groom, J. D., Dent, L., Madsen, L. J., & Fleuret, J. (2011b). Response of western Oregon (USA) stream temperatures to contemporary forest management. Forest Ecology and Management, 262(8), 1618-1629.	10.1016/j.foreco.2011.07.012	http://doi.org/10.1016/j.foreco.2011.07.012	BACI experiment in western oregon to test the efficacy of new riparian management protocols in preserving stream side shade and in-stream temperatures.	2011	SHD	X				BACI	Multiple, Oregon coast	Oregon	Completed
Stream temperature change detection for state and private forests in the Oregon Coast Range	Groom, J. D., L. Dent, and L. J. Madsen. (2011a). Stream temperature change detection for state and private forests in the Oregon Coast Range, Water Resour. Res. 47, W01501	10.1029/2009WR009061	https://doi.org/10.1029/2009WR009061	This study evaluates the effect of forest management on stream shade and stream temperature, testing differences between no harvest and treatment under Oregon forest practice rules	2011	SHD					BACI	Multiple, Oregon coast	Oregon	Completed
Stream and bed temperature variability in a coastal headwater catchment: influences of surface-subsurface interactions and partial-retention forest harvesting	Guenther, S. M., Gomi, T., & Moore, R. D. (2014). Stream and bed temperature variability in a coastal headwater catchment: influences of surface-subsurface interactions and partial-retention forest harvesting. Hydrological Processes, 28(3), 1238-1249	10.1002/hyp.9673	http://doi.org/10.1002/hyp.9673	This study examined the temperatures in four coastal headwater catchments to determine differences in surface/sub-surface variability as well as influences of partial retention harvesting on stream temp.	2014	SHD					BACI	49°16' N 122°34' W	British Columbia, Canada	Completed
Riparian litter inputs to streams in the central Oregon Coast Range	Hart, Stephanie K., David E. Hibbs, and Steven S. Perakis. "Riparian litter inputs to streams in the central Oregon Coast Range." Freshwater Science 32.1 (2013): 343-358.	10.1899/12-074.1	http://doi.org/10.1899/12-074.1	This study examined how riparian forest characteristics (i.e., composition, understory density, slope) influence litter input to streams.	2013	LIT, NUT			X		ACI	(44°219'N, 123°349'W	Oregon	Completed
Effects of contemporary forest harvesting on suspended sediment in the Oregon Coast Range: Alsea Watershed Study Revisited	Hatten, J. A., Segura, C., Bladon, K. D., Hale, V. C., Ice, G. G., & Stednick, J. D. (2018). Effects of contemporary forest harvesting on suspended sediment in the Oregon Coast Range: Alsea Watershed Study Revisited. *Forest Ecology and Management*, *408*, 238-248.	10.1016/j.foreco.2017.10.049	http://doi.org/10.1016/j.foreco.2017.10.049	This comparative study evaluated the effect of contemporary forest harvesting practices on suspended stream sediment concentrations and also examined the legacy effects of historical harvesting practices on suspended sediment concentrations.	2018	SED	X				ACI	44.5°N, 123.9°W	Oregon	Completed
Changes in Solar Input, Water Temperature, Periphyton Accumulation, and Allochthonous Input and Storage after Canopy Removal along Two Small Salmon Streamsin Southeast Alaska	Hetrick, N.J. M. A. Brusven , W. R. Meehan & T. C. Bjornn(1998) Changes in Solar Input, Water Temperature, Periphyton Accumulation, and Allochthonous Input and Storage after Canopy Removal along Two Small Salmon Streamsin Southeast Alaska, Transactions of the American Fisheries Society, 127:6, 859-875	10.1577/1548-8659(1998)127<0859:CISIWT>2.0.CO;2	https://doi.org/10.1577/1548-8659(1998)127<0859:CISIWT>2.0.CO;2	This study evaluates the effects of forest mangaement on stream shade, stream temperature, and litterfall recruitment, testing differences between treatments creating open and closed canopies	2011	SHD, LIT					ACI	Prince of Wales Island, Eleven and Woodsy creeks	Alaska	Completed
Hydrogeomorphic and Biotic Drivers of Instream Wood Differ Across Sub-basins of the Columbia River Basin, USA	Hough-Snee, N., Kasprak, A., Rossi, R. K., Bouwes, N., Roper, B. B., & Wheaton, J. M. (2016). Hydrogeomorphic and Biotic Drivers of Instream Wood Differ Across Sub-basins of the Columbia River Basin, USA. River Research and Applications, 32(6), 1302–1315. https://doi.org/10.1002/rra.2968	10.1002/rra.2968	https://doi.org/10.1002/rra.2968	This paper seeks to determine which riparian, geomorphic, and hydrologic attributes are most strongly correlated to instream wood loads both within and between individual sub-basins of the interior Columbia Rivier Basin.	2015	SHD, LWD					Modeling, corelative analysis	Multiple	Canada, Oregon, Washington, Idaho	Completed
Water Temperature Evaluation of Hardwood Conversion Treatment Sites Data Collection Report.	Hunter, M. A. (2010). Water Temperature Evaluation of Hardwood Conversion Treatment Sites Data Collection Report.		https://dnr.wa.gov/publications/fp_cmer_05_513.pdf	This study evaluates the effect of forest management on stream shade and stream temperature, testing differences between no harvest and hardwood conversion treatments	2010	SHD					ACI	Multiple, Olympic Peninsula	Washington	Completed
Summer Water Temperatures in Alluvial and Bedrock Channels of the Olympic Peninsula	Hunter, M. A., & Quinn, T. (2009). Summer water temperatures in alluvial and bedrock channels of the Olympic Peninsula. Western Journal of Applied Forestry, 24(2), 103-108.	10.1093/wjaf/24.2.103	http://doi.org/10.1093/wjaf/24.2.103	This study examined how differences in stream geomorphology affect water temperature.	2009	stream temperature					AI	Multiple, Olympic Peninsula	Washington	Completed
The residence time of large woody debris in the Queets River, Washington, USA	Hyatt, T. L., & Naiman, R. J. (2001). The residence time of large woody debris in the Queets River, Washington, USA. Ecological Applications, 11(1), 191-202.	10.2307/3061066	http://doi.org/10.2307/3061066	This study examined the depletion rate of LWD in streams by comparing size and species composition from stream LWD to values of the forest trees where they originated.	2001	LWD					AI	West slope, Queets River	Washington	Completed
Timber harvest impacts on small headwater stream channels in the coast ranges of Washington	Jackson, C. R., C. A. Sturm, and J. M. Ward. 2001. Timber harvest impacts on small headwater stream channels in the coast ranges of Washington. JAWRA Journal of the American Water Resources Association 37(6):1533-1549.	10.1111/j.1752-1688.2001.tb03658.x	https://doi.org/10.1111/j.1752-1688.2001.tb03658.x	This study evaluates the effect of forest management on stream temperature, large woody debris, and stream sediment, testing differences between no harvest and clearcut, thinning, and buffered treatments	2001	SED, LWD					BACI	Wilapa hills, southern foothills of Olympic mountains	Washington	Completed
Instream wood loads in montane forest streams of the Colorado Front Range, USA	Jackson, K. J., & Wohl, E. (2015). Instream wood loads in montane forest streams of the Colorado Front Range, USA. Geomorphology, 234, 161-170.	10.1016/j.geomorph.2015.01.022	http://doi.org/10.1016/j.geomorph.2015.01.022	This study examined instream wood loads and geomorphic effects between streams draining montane forests of different age and disturbance history.	2015	LWD				X	CI, regression analysis	North and South Forks of the Cache la Poudre River	Colorado	Completed
Headwater stream temperature: Interpreting response after logging, with and without riparian buffers, Washington, USA	Janisch, J. E., Wondzell, S. M., & Ehinger, W. J. (2012). Headwater stream temperature: Interpreting response after logging, with and without riparian buffers, Washington, USA. Forest Ecology and Management, 270, 302-313.	10.1016/j.foreco.2011.12.035	http://doi.org/10.1016/j.foreco.2011.12.035	This study examines the response of stream temperature to forest harvest, testing differences in continuous vs. patch buffers.	2012	SHD	X	X			BACI	Willapa hills	Washington	Completed

Stream temperature responses to forest harvest and debris flows in western Cascades, Oregon	Johnson, S. L., & Jones, J. A. (2000). Stream temperature responses to forest harvest and debris flows in western Cascades, Oregon. *Canadian Journal of Fisheries and Aquatic Sciences*, *57*(S2), 30-39.	10.1139/f00-109	https://doi.org/10.1139/f00-109	This study investigates short-term and long-term effects of forest harvest on stream temperatures. Increases in temperatures were found to be caused primarily by the increase in short-wave radiation. The design incorporated 2 harvest plans, clear-cut and patch cutting.	2000	SHD							BACI	western Cascades	Oregon	Completed
Riparian forest disturbances by a mountain flood — the influence of floated wood	Johnson, S. L., Swanson, F. J., Grant, G. E., & Wondzell, S. M. (2000). Riparian forest disturbances by a mountain flood—the influence of floated wood. *Hydrological processes*, *14*(16-17), 3031-3050.	10.1002/1099-1085(200011/12)14:16/17<3031::AID-HYP133>	https://doi.org/10.1002/1099-1085(200011/12)14:16/17<3031::AID-HYP133>3.0.CO;2-6	This study investiogates the frequency and impact of flood disturbances and channel morphology on sediment and LW input and transport. There is some investigation of the severity of impact based on buffer harvest histories.	2000	LWD, SED, Dist							correlative analysis, qualitative	McKenzie River Basin	Oregon	Completed
ABUNDANCE AND FUNCTION OF LARGE WOODY DEBRIS IN SMALL, HEADWATER STREAMS IN THE ROCKY MOUNTAIN FOOTHILLS OF ALBERTA, CANADA	Jones, T. A., Daniels, L. D., & Powell, S. R. (2011). Abundance and function of large woody debris in small, headwater streams in the Rocky Mountain foothills of Alberta, Canada. *River Research and Applications*, *27*(3), 297-311.	10.1002/rra.1353	http://doi.org/10.1002/rra.1353	This study examined differences in abundance and function of LWD based on location relative to stream channel.	2011	LWD							Comparative analysis	Athabasca and North Saskatchewan River watersheds	Alberta, Canada	Completed
Effects of timber harvest on suspended sediment loads in Mica Creek, Idaho.	Karwan, D. L., Gravelle, J. A., & Hubbart, J. A. (2007). Effects of timber harvest on suspended sediment loads in Mica Creek, Idaho. Forest Science, 53(2), 181-188.	10.1093/forestscience/53.2.181	https://doi.org/10.1093/forestscience/53.2.181	BACI experiment in Mica Creek ID to test effects of timber harvest on suspended sediments in streams following timber harvest. One watershed was clearcut outside of the 75 ft buffer, and one was partially cut outside of the RMZ. Partial cut showed no difference in SSP when compared to the reference (no harvest),	2007	SED	X	X					BACI	Mica Creek	Idaho	Completed
Long-term effects of riparian forest harvest on light in Pacific Northwest (USA) streams	Kaylor, M. J., Warren, D. R., & Kiffney, P. M. (2017). Long-term effects of riparian forest harvest on light in Pacific Northwest (USA) streams. Freshwater Science, 36(1), 1-13.	10.1086/690624	http://doi.org/10.1086/690624	This study exmaines the effects of riparian forest harvest and varying stages of stand recovery on light availability.	2017	SHD					X		AI	H.J. Andrews	Oregon	Completed
Effect of contemporary forest harvesting practices on headwater stream temperatures: Initial response of the Hinkle Creek catchment, Pacific Northwest, USA	Kibler, K. M., Skaugset, A., Ganio, L. M., & Huso, M. M. (2013). Effect of contemporary forest harvesting practices on headwater stream temperatures: Initial response of the Hinkle Creek catchment, Pacific Northwest, USA. Forest ecology and management, 310, 680-691.	10.1016/j.foreco.2013.09.009	http://doi.org/10.1016/j.foreco.2013.09.009	This study examined the effects of contemporary forest management practices on warm-season stream temperature regimes in headwater streams.	2013	SHD							BACI	Hinkle Creek Watershed	Oregon	Completed
Organic matter inputs into headwater streams of southwestern Biritish Columbia as a function of riparian reserves and time since harvesting.	Kiffney, P., and J. Richardson. 2010. Organic matter inputs into headwater streams of southwestern Biritish Columbia as a function of riparian reserves and time since harvesting. Forest Ecology and Management. 260:1931-1942.	10.1016/j.foreco.2010.08.016	https://doi.org/10.1016/j.foreco.2010.08.016	This study evaluates the effects of forest management, measuring organic matter/ litterfall recruitment, testing differences among riparian buffer widths and time since harvesting	2010	LIT	X				X		ACI	(122◦ 34′W, 49° 16′N)	British Columbia, Canada	Completed
How important is geology in evaluating stream habitat?	Kusnierz, P. C., & Sivers, E. (2018). How important is geology in evaluating stream habitat?. Journal of soils and sediments, 18(3), 1176-1184.	10.1007/s11368-017-1885-z	http://doi.org/10.1007/s11368-017-1885-z	This study evaluates the role of geology and geologic response to environmental and anthropogenic factors.	2018	SED							AI	Multiple sites western Montana	Montana	Completed
Spatial and seasonal variability of forested headwater stream temperatures in western Oregon, USA	Leach, J. A., Olson, D. H., Anderson, P. D., & Eskelson, B. N. I. (2017). Spatial and seasonal variability of forested headwater stream temperatures in western Oregon, USA. Aquatic Sciences, 79(2), 291-307.	10.1007/s00027-016-0497-9	http://doi.org/10.1007/s00027-016-0497-9	This case study examined the relationships between stream temperature variability in space and time, as well as evaluated changes in stream temperature based variability in weather, canopy cover, and geology.	2017	SHD							AI	N44"31'"41.0"; W122"37"55.0"	Oregon	Completed
Floodplain Large Wood and Organic Matter Jam Formation After a Large Flood: Investigating the Influence of Floodplain Forest Stand Characteristics and River Corridor Morphology	Lininger, K. B., Scamardo, J. E., & Guiney, M. R. (2021). Floodplain large wood and organic matter jam formation after a large flood: Investigating the influence of floodplain forest stand characteristics and river corridor morphology. Journal of Geophysical Research: Earth Surface, 126(6), e2020JF006011.	10.1029/2020JF006011	http://doi.org/10.1029/2020JF006011	This study examines how river corridor morphology and forest stand density influence LWD and coarse particulate matter deposition patterns resulting from a flood	2021	LWD							Correlative analysis	west Creek	Colorado	Completed
Post-harvest riparian buffer response: Implications for wood recruitment modeling and buffer design	Liquori, M. K. (2006). POST-HARVEST RIPARIAN BUFFER RESPONSE: IMPLICATIONS FOR WOOD RECRUITMENT MODELING AND BUFFER DESIGN 1. JAWRA Journal of the American Water Resources	10.1111/j.1752-1688.2006.tb03832.x	http://doi.org/10.1111/j.1752-1688.2006.tb03832.x	This study examines differences in post-harvest ecological and geomorphic processes in buffered forest sites	2006	Other processes, disturbance post-harvest			X				AI	western Cascades	Washington	Completed
Frequency and characteristics of sediment delivery pathways from forest harvest units to streams	Litschert, S. E., & MacDonald, L. H. (2009). Frequency and characteristics of sediment delivery pathways from forest harvest units to streams. *Forest Ecology and Management*, *259*(2), 143-150.	10.1016/j.foreco.2009.09.038	http://doi.org/10.1016/j.foreco.2009.09.038	This study assessed streamside management zones to understand characteristics of the sediment delivery pathways following upland harvest.	2009	SED						X	AI	Eldorado, Lassen, Plumas, and Tahoe National Forests (NF) in the Sierra Nevada and Cascade mountains of	California	Completed
The effects of forest harvesting and best management practices on streamflow and suspended sediment concentrations during snowmelt in headwater streams in sub-boreal forests of British Columbia, Canada	Macdonald, J. S., Beaudry, P. G., MacIsaac, E. A., & Herunter, H. E. (2003a). The effects of forest harvesting and best management practices on streamflow and suspended sediment concentrations during snowmelt in headwater streams in sub-boreal forests of British Columbia, Canada. *Canadian Journal of Forest Research*, *33*(8), 1397-1407.	10.1139/x03-110	https://doi.org/10.1139/x03-110	This study evaluates the effects of 2 different harvest prescriptions on suspended sediment concentrations for one year prior and 5 years post harvest.	2003	SED							BACI	Takla Lake	BC, Canada	Completed
The effect of variable-retention riparian buffer zones on water temperatures in small headwater streams in sub-boreal forest ecosystems of British Columbia.	Macdonald, J. S., MacIsaac, E. A., & Herunter, H. E. (2003b). The effect of variable-retention riparian buffer zones on water temperatures in small headwater streams in sub-boreal forest ecosystems of British Columbia. Canadian journal of forest	10.1139/x03-015	https://doi.org/10.1139/x03-015	This study examined the effects of three different variable retention harvesting prescriptions on stream temperature	2003	SHD							ACI	Takla Lake	British Columbia, Canada	Completed
Stand mortality in buffer strips and the supply of woody debris to streams in Southeast Alaska.	Martin, D. J., & Grotefendt, R. A. (2007). Stand mortality in buffer strips and the supply of woody debris to streams in Southeast Alaska. *Canadian Journal of Forest Research*, *37*(1), 36-49.	10.1139/X06-209	https://doi.org/10.1139/x06-209	This study compared site conditions between riparian buffer strips and unlogged riparian stands using aereal photography to determine mortality and LWD recruitment	2007	LWD			X	X			ACI	Multiple sites southeast panhandle	Alaska	Completed
Large wood recruitment and redistribution in headwater streams in the southern Oregon Coast Range, U.S.A.	May, C. L., & Gresswell, R. E. (2003). Large wood recruitment and redistribution in headwater streams in the southern Oregon Coast Range, USA. *Canadian Journal of Forest Research*, *33*(8), 1352-1362.	10.1139/x03-023	https://doi.org/10.1139/x03-023	This paper investigates the mechanisms responsible for LWD recruitment into streams. results show evidence that stream size and topographic settings had the strongest influence on recruitment. Slope was most important in smaller streams while windthrow was most important in larger streams.	2003	LWD, SED						X	modeling, Regression analysis	Cherry Creek Research Natural Area	Oregon	Completed
Implications of riparian management strategies on wood in streams of the Pacific Northwest	Meleason, M. A., Gregory, S. V., & Bolte, J. P. (2003). Implications of riparian management strategies on wood in streams of the Pacific Northwest. Ecological Applications, 13(5), 1212-1221.	10.1890/02-5004	http://doi.org/10.1890/02-5004	This study used a model to evaluate the potential effects of different riparian management strategies on the standing stock of wood in a hypothetical stream	2003	LWD							Modeling	PNW, hypothetical stream	PNW, hypothetical stream	Completed
Sediment supply and channel morphology in mountain river systems: 1. Relative importance of lithology, topography, and climate	Mueller, E. R., & Pitlick, J. (2013). Sediment supply and channel morphology in mountain river systems: 1. Relative importance of lithology, topography, and climate. *Journal of Geophysical Research: Earth Surface*, *118*(4), 2325-2342.	10.1002/2013JF002843	https://agupubs.onlinelibrary.wiley.com/doi/pdfdirect/10.1002/2013JF002843	This study focuses on the relative importance of lithology as a driver of sediment delivery into streams. Results suggest that lithology is more important in estimating sediment supply than topography. As lithologies become dominated by softer parent materials, sediment concentrations increased.	2013	SED							spatial model, correlative analysis	Multiple sites, ID, WY, MT	ID, WY, MT	Completed

Influence of partial harvesting on stream temperatures, chemistry, and turbidity in forests on the western Olympic Peninsula, Washington.	Murray, G. L. D., Edmonds, R. L., & Marra, J. L. (2000). Influence of partial harvesting on stream temperatures, chemistry, and turbidity in forests on the western Olympic Peninsula, Washington. *Northwest science.* , *74* (2), 151-164.		https://hdl.handle.net/2376/1065	This study examined the influence of partial harvesting on stream temperature, chemistry, and turbidity in two watersheds using an uncut old-growth watershed as a control.	2000	SHD, SED, NUT						ACI	West Twin, Rock, and Tower creeks	Washington	Completed
Influences on wood load in mountain streams of the Bighorn National Forest, Wyoming, USA	Nowakowski, A. L., & Wohl, E. (2008). Influences on wood load in mountain streams of the Bighorn National Forest, Wyoming, USA. Environmental Management, 42(4), 557-571.	10.1007/s00267-008-9140-4	http://doi.org/10.1007/s00267-008-9140-4	This study examined differences in wood load and valley/channel characteristics between forested headwater streams which had history of management and harvesting to sites which did not have prior history of management/harvesting.	2008	LWD						ACI	Big Horn NF, North Rock Creek	Wyoming	Completed
Large woody debris and land management in California's hardwood-dominated watersheds	Opperman, J. J. (2005). Large woody debris and land management in California's hardwood-dominated watersheds. Environmental Management, 35(3), 266-277.	10.1007/s00267-004-0068-z	http://doi.org/10.1007/s00267-004-0068-z	This study examined levels of LWD in a hardwood dominated watershed and then further examined how levles vary with channel properties such as slope and width.	2005	LWD						Regression analysis	northern California in Mendocino, Sonoma, Marin, Contra Costa, and Alameda counties	California	Completed
STREAM TEMPERATURE RELATIONSHIPS TO FOREST HARVEST IN WESTERN WASHINGTON	Pollock, M. M., Beechie, T. J., Liermann, M., & Bigley, R. E. (2009). Stream temperature relationships to forest harvest in western Washington 1. JAWRA Journal of the American Water Resources Association, 45(1), 141-156.	10.1111/j.1752-1688.2008.00266.x	http://doi.org/10.1111/j.1752-1688.2008.00266.x	This study examines the influence of forest harvests on stream temperature testing differences between unharvested watersheds and those that were harvested.	2009	SHD						ACI	west side of the Olympic Peninsula, Washington	Washington	Completed
Runoff and sediment production from harvested hillslopes and the riparian area during high intensity rainfall events	Puntenney-Desmond, K. C., Bladon, K. D., & Silins, U. (2020). Runoff and sediment production from harvested hillslopes and the riparian area during high intensity rainfall events. Journal of Hydrology, 582, 124452.	10.1016/j.j	https://doi.org/10.1016/j.jhydrol.2019.124452	Southwest alberta, on eastern rockies near Montana. Shows the potential effect of climate change on sediment yield and concentrations in riparian area run-offs. Also compares run-off rates and sediment transport in riparian areas relative to harvested upland areas.	2020	SED						Simulation Modeling	Star Creek, Northern Rockies	Alberta, Canada	Completed
Quantifying effects of forest harvesting on sources of suspended sediment to an Oregon Coast Range headwater stream	Rachels, A. A., Bladon, K. D., Bywater-Reyes, S., & Hatten, J. A. (2020). Quantifying effects of forest harvesting on sources of suspended sediment to an Oregon Coast Range headwater stream. Forest Ecology and Management, 466, 118123.	10.1016/j.foreco.2020.118123	http://doi.org/10.1016/j.foreco.2020.118123	This study used a sediment source fingerprinting technique to quantify the source of suspended sediment to a stream draining a recent harvested catchment with 15m buffer and an unharvested catchment	2020	SED, SBS						ACI	44.55 °N, 123.52 °W	Oregon	Completed
Response of In-Stream Wood to Riparian Timber Harvesting: Field Observations and Long-Term Projections	Reid, D. A., & Hassan, M. A. (2020). Response of in-stream wood to riparian timber harvesting: Field observations and long-term projections. Water Resources Research, 56(8), e2020WR027077.	10.1029/2020WR027077	http://doi.org/10.1029/2020WR027077	This study combines a wood budget model and a 45-year record of LWD to examine changes in LWD characteristics and long term impacts from riparian logging.	2020	LWD						Modeling	Carnation Creek, Vancouver Island	BC, Canada	Completed
Stream Temperature Patterns over 35 Years in a Managed Forest of Western Washington	Reiter, M., Bilby, R. E., Beech, S., & Heffner, J. (2015). Stream temperature patterns over 35 years in a managed forest of western Washington. *JAWRA Journal of the American Water Resources Association* , *51* (5), 1418-1435.	10.1111/1752-1688.12324	http://doi.org/10.1111/1752-1688.12324	This study assesses the long term combined effects of hydro-climatic factors and intensively managed forests with buffers on stream temperature	2015	SHD						BAI	headwaters of the Deschutes River, Washington watershed	Washington	Completed
Temporal and Spatial Turbidity Patterns Over 30 Years in a Managed Forest of Western Washington	Reiter, M., Heffner, J. T., Beech, S., Turner, T., & Bilby, R. E. (2009). Temporal and Spatial Turbidity Patterns Over 30 Years in a Managed Forest of Western Washington 1. *JAWRA Journal of the American Water Resources Association* , *45* (3), 793-808.	10.1111/j.1752-1688.2009.00323.x	http://doi.org/10.1111/j.1752-1688.2009.00323.x	This study examines the effects of forest practices on sediment production at the watershed-scale with 30 years of water quality data	2009	SED						AI	headwaters of the Deschutes River, Washington watershed	Washington	Completed
Summer stream temperature changes following forest harvest in the headwaters of the Trask River watershed, Oregon Coast Range	Reiter, M., Johnson, S. L., Homyack, J., Jones, J. E., & James, P. L. (2020). Summer stream temperature changes following forest harvest in the headwaters of the Trask River watershed, Oregon Coast Range. Ecohydrology, 13(3), e2178.	10.1002/eco.2178	http://doi.org/10.1002/eco.2178	This study evaluates the effects of harvesting and variable buffer widths on stream temperature	2020	SHD	X					BACI	Trask River Watershed	Oregon	Completed
Shade, light, and stream temperature responses to riparian thinning in second-growth redwood forests of northern California.	Roon, D. A., Dunham, J. B., & Groom, J. D. (2021a). Shade, light, and stream temperature responses to riparian thinning in second-growth redwood forests of northern California. PloS One, 16(2), e0246822–e0246822. https://doi.org/10.1371/journal.pone.0246822	10.1371/journal.pone.0246822	https://doi.org/10.1371/journal.pone.0246822	Thinnig effects of second growth redwood forests in northwestern California. Thermal increases and changes in timing of thermal variability occurred locally and downstream.	2021	SHD	X	X				BACI	West Fork Tectah and East Fork Tectah watersheds the lower Klamath River	California	Completed
A riverscape approach reveals downstream propagation of stream thermal responses to riparian thinning at multiple scales	Roon, D. A., Dunham, J. B., & Torgersen, C. E. (2021b). A riverscape approach reveals downstream propagation of stream thermal responses to riparian thinning at multiple scales. *Ecosphere* , *12* (10), e03775.	10.1002/ecs2.3775	http://doi.org/10.1002/ecs2.3775	Investigation of how different thinning intesities effect stream temperature via loss of canopy cover at local and watershed scales. The novelty of this study is the examination of downstream effects of canopy loss on stream temperatures.	2021	SHD, temperature						BACI	Tectah Creek	California	Completed
Stream channel configuration, landform, and riparian forest structure in the Cascade Mountains, Washington	Rot, B. W., Naiman, R. J., & Bilby, R. E. (2000). Stream channel configuration, landform, and riparian forest structure in the Cascade Mountains, Washington. *Canadian Journal of Fisheries and Aquatic Sciences* , *57* (4), 699-707.	10.1139/f00-002	http://doi.org/10.1139/f00-002	This study evaluates the relationships between valley constraint, riparian landform, plant communities, channel type, channel configuration, and LWD. Also, the relationship between riparian plant community composition and adjacent landforms.	2000	LWD, stand structure and composition						Regression analysis	Western Cascades	Washington	Completed
Disentangling effects of forest harvest on long-term hydrologic and sediment dynamics, western Cascades, Oregon	Safeeq, M., Grant, G. E., Lewis, S. L., & Hayes, S. K. (2020). Disentangling effects of forest harvest on long-term hydrologic and sediment dynamics, western Cascades, Oregon. *Journal of Hydrology* , *580* , 124259.	10.1016/j.jhydrol.2019.124259	http://doi.org/10.1016/j.jhydrol.2019.124259	This study presents an approach at isolating the streamflow effect on sediment dellivery by reconstructing a streamflow time series from a previous study which captured data on pre and post harvest.	2020	SED					X	BACI	H.J. Andrews	Oregon	Completed
Changes in stand structure, buffer tree mortality and riparian-associated functions 10 years after timber harvest adjacent to non-fish-bearing perennial streams in western Washington.	Schuett-Hames, D & Stewart, G. (BCIF), (2019b). Changes in stand structure, buffer tree mortality and riparian-associated functions 10 years after timber harvest adjacent to non-fish-bearing perennial streams in western Washington. Cooperative		https://www.dnr.wa.gov/publications/bc_tfw_bcifsixquest_20200106.pdf https://www.dnr.wa.gov/publications/bc_cmer_bcif_westside_20201013.pdf	The study analyzes the changes in stand structure, buffer tree mortality, and riparian functions 10 years after upland timber harvest	2019	LWD, SHD, SED		X	X			ACI	Multiple sites western Washington	Washington	Completed
Post-Harvest Change in Stand Structure, Tree Mortality and Tree Fall in Eastern Washington Riparian Buffers.	Schuett-Hames, D., & Stewart, G. (2019a). Post-Harvest Change in Stand Structure, Tree Mortality and Tree Fall in Eastern Washington Riparian Buffers. Cooperative Monitoring Evaluation and Research Report. Washington State Forest Practices		https://www.dnr.wa.gov/publications/fp_cmer_bto_add_20201013.pdf	comparison of LWD inputs, tree fall, and stand structure 5 years post harvest in the mixed conifer THT under the AAS and SR shade rules relative to unharvested stands in northeastern WA. Nice summary of rules and prefeered species	2019	LWD			X	X		ACI	Multiple sites eastern Washington	Washington	still needed
Results of the Westside Type N Buffer Characteristics, Integrity and Function Study Final Report.	Schuett-Hames, D., A. Roorbach, and R. Conrad. (2011). Results of the Westside Type N Buffer Characteristics, Integrity and Function Study Final Report. Cooperative Monitoring Evaluation and Research Report, CMER 12-1201, Washington Department of Natural Resources, Olympia, WA.		https://www.dnr.wa.gov/publications/fp_cmer_12_1201.pdf	This study evaluates the effects of forest management on stream shade, large woody debris recruitment, and sediment delivery, testing the differences between no harvest and treatments under Washington forest practice rules	2012	SHD, LWD, SED			X			ACI	Multiple sites western Washington	Washington	Completed
Effects of current forest practices on organic matter dynamics in headwater streams at the Trask river watershed, Oregon	Six, L. J., Bilby, R. E., Reiter, M., James, P., & Villarin, L. (2022). Effects of current forest practices on organic matter dynamics in headwater streams at the Trask river watershed, Oregon. Trees, Forests and People, 8, 100233.	10.1016/j.tfp.2022.100233	http://doi.org/10.1016/j.tfp.2022.100233	This study assessed differences in levels of riparian buffer retention at mitigating changes to organic matter dynamics.	2022	LIT, LWD						BACI	Trask River Watershed	Oregon	Completed

Riparian tree fall directionality and modeling large wood recruitment to streams.	Sobota, D. J., Gregory, S. V., & Sickle, J. V. (2006). Riparian tree fall directionality and modeling large wood recruitment to streams. Canadian Journal of Forest Research, 36(5), 1243–1254. https://doi.org/10.1139/x06-022	10.1139/x06-022	https://doi.org/10.1139/x06-022	Study of riparian characteristics and their effects on tree fall direction and in-stream recruitment. Results show valley constraint is the best predictor of tree fall tendency toward streams. The tendency for trees to fall towards streams increased considerably on slopes >40%. LWD in streams was 1.5-2.4 times more likely in steep hillslopes. (maybe)	2006	LWD			X			model with field data	multiple sites	Idaho, Washington, Oregon, Montana	Completed
Streamside management zone effectiveness for water temperature control in Western Montana	Sugden, B. D., Steiner, R., & Jones, J. E. (2019). Streamside management zone effectiveness for water temperature control in Western Montana. International Journal of Forest Engineering, 30(2), 87-98.	10.1080/14942119.2019.1571472	http://doi.org/10.1080/14942119.2019.1571472	This study assessed the efficacy of Montana SMZ guidlines for controlling stream temperature.	2019	SHD	X					BACI	Multiple sites western Montana	Montana	Completed
Stream temperature responses to experimental riparian canopy gaps along forested headwaters in western Oregon	Swartz, A., Roon, D., Reiter, M., & Warren, D. (2020). Stream temperature responses to experimental riparian canopy gaps along forested headwaters in western Oregon. *Forest Ecology and Management*, *474*, 118354.	10.1016/j.foreco.2020.118354	https://doi.org/10.1016/j.foreco.2020.118354	This study assessed whether and to what degree experimental canopy gaps meant to mimic natural disturbances affect stream temperature	2020	SHD	X	X				BACI	McKenzie River Basin	Oregon	Completed
Simulating the effects of forest management on large woody debris in streams in northern Idaho	Teply, M., McGreer, D., Schult, D., & Seymour, P. (2007). Simulating the effects of forest management on large woody debris in streams in northern Idaho. Western Journal of Applied Forestry, 22(2), 81–87. https://doi.org/10.1093/wjaf/22.2.81	10.1093/wjaf/22.2.81	https://doi.org/10.1093/wjaf/22.2.81	This paper uses simulation modeling to compare the effects of the SRBA/IFP riparian managent harvest prescriptions and no-harvest RMZs on LWD recruitment in streams. Results predict there will be no difference in LWD in stream loading/recruitment for SRBA/IFP RMZs and no harvest RMZs.	2014	LWD						Modeling	Priest Lake study area	Idaho	Completed
Biogeochemistry of unpolluted forested watersheds in the Oregon Cascades: temporal patterns of precipitation and stream nitrogen fluxes	Vanderbilt, K. L., Lajtha, K., & Swanson, F. J. (2003). Biogeochemistry of unpolluted forested watersheds in the Oregon Cascades: temporal patterns of precipitation and stream nitrogen fluxes. *Biogeochemistry*, *62*(1), 87-117.	10.1023/A:1021171016945	http://doi.org/10.1023/A:1021171016945	Study from H.J. Andrews, shows correlation of nutrient inputs with weather events (mainly precipitation). Comparison of nutrient input with multiple watersheds across NA as a control.	2003					X	X	ACI	H.J. Andrews	Oregon	Completed
Comparing streambed light availability and canopy cover in streams with old-growth versus early-mature riparian forests in western Oregon	Warren, D. R., Keeton, W. S., Bechtold, H. A., & Rosi-Marshall, E. J. (2013). Comparing streambed light availability and canopy cover in streams with old-growth versus early-mature riparian forests in western Oregon. Aquatic sciences, 75(4), 547-558.	10.1007/s00027-013-0299-2	http://doi.org/10.1007/s00027-013-0299-2	This study evaluated stand age and associated canopy structural differences on stream light in second-order streams, testing differences between old-groth and second growth riparian forests	2013	SHD					X	ACI	H.J. Andrews	Oregon	Completed
Watershed influences on the structure and function of riparian wetlands associated with headwater streams - Kenai Peninsula, Alaska	Whigham, D. F., Walker, C. M., Maurer, J., King, R. S., Hauser, W., Baird, S., ... & Neale, P. J. (2017). Watershed influences on the structure and function of riparian wetlands associated with headwater streams–Kenai Peninsula, Alaska. *Science of the Total Environment*, *599*, 124-134.	10.1016/j.scitotenv.2017.03.290	http://doi.org/10.1016/j.scitotenv.2017.03.290	This study evaluates the differences in nutrient (inorganic N) concentrations in riparian soil, litter, and litter decomp between riparian areas with and without alder species present.	2017	Structure/composition, LIT, NUT						CI	southern portion of the Kenai Peninsula	Alaska	Completed
Relationships of channel characteristics, land ownership, and land use patterns to large woody debris in western Oregon streams	Wing, M. G., & Skaugset, A. (2002). Relationships of channel characteristics, land ownership, and land use patterns to large woody debris in western Oregon streams. *Canadian Journal of Fisheries and Aquatic Sciences*, *59*(5), 796-807.	10.1139/F02-052	http://doi.org/10.1139/F02-052	This study examines the relationship between channel characteristics and LWD in streams. The relevant data of this study finds that within forested riparian areas, LWD abundance was predicted primarily by stream gradient and bankfull width.	2002	LWD			X			Regression analysis	Multiple sites western Oregon	Oregon	Completed
Tree ring record of streamflow and drought in the upper Snake River	Wise, E. K. (2010). Tree ring record of streamflow and drought in the upper Snake River. Water Resources Research, 46(11).	10.1029/2010WR009282	http://doi.org/10.1029/2010WR009282	This study uses tree rings to augment previous records to reconstuct a multi-century understanding of streamflow data for the Snake River. Data for drought frequency in past 400 years.	2010					X			The upper Snake River Basin, Wyoming	Wyoming	Completed
Spatially explicit estimates of erosion risk indices and variable riparian buffer widths in watersheds	Wissmar, R.C., Beer, W.N. & Timm, R.K. Spatially explicit estimates of erosion-risk indices and variable riparian buffer widths in watersheds. *Aquat. Sci.* **66**, 446–455 (2004). https://doi.org/10.1007/s00027-004-0714-9	10.1007/s00027-004-0714-9	http://doi.org/10.1007/s00027-004-0714-9	This study evaluates what site characteristics (e.g., land cover, structure, soils...) correlate with erosion-prone areas in the tributary watersheds of the Beckler-rapid River drainage.	2004							spatial modeling	48N, 121W	Washington	Completed
Stream Water Chemistry in Mixed-Conifer Headwater Basins: Role of Water Sources, Seasonality, Watershed Characteristics, and Disturbances	Yang, Y., Hart, S. C., McCorkle, E. P., Stacy, E. M., Barnes, M. E., Hunsaker, C. T., ... & Berhe, A. A. (2021). Stream water chemistry in mixed-conifer headwater basins: role of water sources, seasonality, watershed characteristics, and	10.1007/s10021-021-00620-0	http://doi.org/10.1007/s10021-021-00620-0	This study examined the temporal variation in response of down stream water chemistry to prolonged drought and low-intensity forest thinning.	2021	NUT		X	X			BACI	Kings River Experimental Watersheds, Sierra NF	California	Completed
Impacts of climate and forest management on suspended sediment source and transport in montane headwater catchments	Yang, Y., Safeeq, M., Wagenbrenner, J. W., Asefaw Berhe, A., & Hart, S. C. (2022). Impacts of climate and forest management on suspended sediment source and transport in montane headwater catchments. Hydrological Processes, 36(9), e14684.	10.1002/hyp.14684	http://doi.org/10.1002/hyp.14684	This paper investigates the changes in sediment yield due to changes in precipitation patterns and drought stress under different buffer retention treatments. The results are not a strong case for management ameliorating the effects of climate change on sediment delivery but gives some insight of in changes of weather related stress events.	2022	SED						CI	Kings River Experimental Watersheds, Sierra NF	California	com
Modelling biophysical controls on stream organic matter standing stocks under a range of forest harvesting impacts	Yeung, A. C., Stenroth, K., & Richardson, J. S. (2019). Modelling biophysical controls on stream organic matter standing stocks under a range of forest harvesting impacts. *Limnologica*, *78*, 125714.	10.1016/j.limno.2019.125714	http://doi.org/10.1016/j.limno.2019.125714	This study modelled the the post-harvest response of leaf litter coarse particulate organic matter quantity in a coastal stream	2019	LIT	X				X	modeling	Model developped from multiple North American sites	Model developped from multiple North American sites	Completed
Effectiveness of Forest Practices Buffer Prescriptions on Perennial Non-fish-bearing Streams on Marine Sedimentary Lithologies in Western Washington	Ehinger, W.J., W.D. Bretherton, S.M. Estrella, G. Stewart, D.E. Schuett-Hames, and S.A. Nelson. (2021). Effectiveness of Forest Practices Buffer Prescriptions on Perennial Non-fish-bearing Streams on Marine Sedimentary Lithologies in Western Washington. Cooperative Monitoring, Evaluation, and Research Committee Report CMER 2021.08.24	CMER #2021.08.24	https://www.dnr.wa.gov/publications/bc_tfw_sr_fin_rpt_20220104.pdf	The purpose of this study was to assess the effectiveness of riparian management zone prescriptions in maintaining functions and processes in headwater perennial, non-fish-bearing streams in incompetent (easily eroded) marine sedimentary lithologies in western Washington.	2021	SHD, SED, NUT, LW	X	X				BACI	multiple	western Washington	completed
Effectiveness of experimental riparian buffers on perennial non-fish-bearing streams on competent lithologies in western Washington – Phase 2 (9 years after harvest).	McIntyre, A.P., M.P. Hayes, W.J. Ehinger, S.M. Estrella, D.E. Schuett-Hames, R. Ojala-Barbour, G. Stewart and T. Quinn (technical coordinators). 2021. Effectiveness of experimental riparian buffers on perennial non-fish-bearing streams on competent lithologies in western Washington – Phase 2 (9 years after	CMER #2021.07.27	https://www.dnr.wa.gov/publications/bc_tfw_hr_fin_rpt_20220104.pdf	This study was a follow-up study to the hard-rock Phase 1 study (McIntyre et al., 2018) to assess changes over longer time periods (up to 9 years post-harvest).The purpose of the study was to evaluate the effectiveness of forest management prescriptions in maintaining aquatic conditions and processes for small non-	2021	SHD, SED, NUT, LW	X	X				BACI	multiple	western Washington	completed
Effectiveness of Experimental Riparian Buffers on Perennial Non-fish-bearing Streams on Competent Lithologies in Western Washington.	Effectiveness of Experimental Riparian Buffers on Perennial Non-fish-bearing Streams on Competent Lithologies in Western Washington. Cooperative Monitoring, Evaluation and Research Report CMER 18-100, Washington State Forest Practices Adaptive	CMER #18-100	https://www.dnr.wa.gov/publications/fp_cmer_hard_rock_phase1_2018.pdf	The purpose of the study was to evaluate the effectiveness of forest management prescriptions in maintaining aquatic conditions and processes for small non-fish-bearing (Type N) headwater stream basins underlain by competent "hard rock" lithologies (i.e., volcanic or igneous rock) in western	2018	SHD, SED, NUT, LW, LIT	X	X				BACI	multiple	western Washington	completed
Long-term response in nutrient load from commercial forest management operations in a mountainous watershed.	Deval, C., Brooks, E. S., Gravelle, J. A., Link, T. E., Dobre, M., & Elliot, W. J. (2021). Long-term response in nutrient load from commercial forest management operations in a mountainous watershed. Forest Ecology and Management, 494, 119312.	10.1016/j.foreco.2021.119312	https://doi.org/10.1016/j.foreco.2021.119312	The purpose of this study was to quantify and compare the differences in nitrogen and phosphorus concentrations and loads between pre-disturbance, post road construction (post-road), post experimental harvest (PH-I), and post operational harvest (PH-II) from both a hydrological yield and nutrient concentration	2021	NUT	X			X		BACI	Mica Creek, Idaho	Idaho	completed

Continuity in fire disturbance between riparian and adjacent sideslope Douglas-fir forests. Forest Ecology and Management, 175(1-3), 31-47.	Everett, R., Schellhaas, R., Ohlson, P., Spurbeck, D., & Keenum, D. (2003). Continuity in fire disturbance between riparian and adjacent sideslope Douglas-fir forests. Forest Ecology and Management, 175(1-3), 31-47.	10.1016/S0378-1127(02)00120-2	https://doi.org/10.1016/S0378-1127(02)00120-2	The purpose of this study was to estimate the frequency and seasonality of fire in Douglas-fir dominated riparian areas and adjacent uplands using fire-scar and stand-cohort records.	2003	Fire frequency	X		Dendrochronology, historical	East Cascade, Washington	Washington	no
Fuel treatment effectiveness in the context of landform, vegetation, and large, wind-driven wildfires.	Prichard, S. J., Povak, N. A., Kennedy, M. C., & Peterson, D. W. (2020). Fuel treatment effectiveness in the context of landform, vegetation, and large, wind-driven wildfires. Ecological Applications, 30(5), 1–22.	10.1002/eap.2104	https://doi.org/10.1002/eap.2104	The objective of this study was to evaluate drivers of fire severity and fuel treatment effectiveness in the 2014 Carlton Complex, wildfire, in north-central Washington.	2020	Fire severity	X	X	Modeling	Carlton Complex wildfire	Washington	no
Historical fires in Douglas-fir dominated riparian forests of the southern Cascades, Oregon.	Olson, D. L., & Agee, J. K. (2005). Historical fires in Douglas-fir dominated riparian forests of the southern Cascades, Oregon. Fire Ecology, 1(1), 50–74. https://doi.org/10.4996/fireecology.0101050	10.4996/fireecology.0101050	https://doi.org/10.4996/fireecology.0101050	The objective of this study was to estimate the frequency of wildfire in riparian areas relative to adjacent upland forests in the Umpqua National Forest.	2005	Fire frequency	X		Dendrochronology, historical	approximately 60-70 kilometers northeast of Roseburg, Oregon.	Oregon	no
A tree-ring based fire history of riparian reserves in the Klamath Mountains. Californian riparian systems: processes and floodplain management, ecology, and restoration.	Skinner, C. N. (2003). A tree-ring based fire history of riparian reserves in the Klamath Mountains. Californian riparian systems: processes and floodplain management, ecology, and restoration'.(Ed. PM Faber) pp, 116-119.		https://www.fs.usda.gov/research/treesearch/36547	The objective of this study was to recreate and compare the fire return intervals for 5 riparian and 5 adjacent upland forests in the Klamath Mountains in northern California.	2003	Fire frequency	X		Dendrochronology, historical	Mt. Shasta Ranger District of the Shasta-Trinity National Forests along the Shasta-Trinity divide in the	California	no
Riparian and adjacent upland forests burned synchronously during dry years in eastern Oregon (1650–1900 CE), USA.	Harley, G. L., Heyerdahl, E. K., Johnston, J. D., & Olson, D. L. (2020). Riparian and adjacent upland forests burned synchronously during dry years in eastern Oregon (1650–1900 CE), USA. International Journal of Wildland Fire, 29(7), 602-. https://doi.org/10.1071/WF19101	10.1071/WF19101	https://doi.org/10.1071/WF19101	The purpose of this study was to assess the synchronysity of wildfire in riparian areas and upland forests in the Blue mountains of north-eastern Oregon..	2020	Fire frequency	X		Dendrochronology, historical	Wallowa-Whitman National Forest and the Malheur National Forest	Oregon	no
Fire exclusion effects on riparian forest dynamics in southwestern Oregon.	Messier, M. S., Shatford, J. P. A., & Hibbs, D. E. (2012). Fire exclusion effects on riparian forest dynamics in southwestern Oregon. Forest Ecology and Management, 264(JAN), 60–71.	10.1016/j.foreco.2011.10.003	https://doi.org/10.1016/j.foreco.2011.10.003	Thre purpose of this study was to estimate the changes in riparian forest structure and fire frequency relative to pre-European settlement along the Rouge River in southwestern Oregon.	2012	Fire frequency	X		Dendrochronology, historical	Surrounding Medford, Oregon	Oregon	no
Stand structure, fuel loads, and fire behavior in riparian and upland forests, Sierra Nevada Mountains, USA; a comparison of current and reconstructed conditions.	Van de Water, K., & North, M. (2011). Stand structure, fuel loads, and fire behavior in riparian and upland forests, Sierra Nevada Mountains, USA; a comparison of current and reconstructed conditions. Forest Ecology and Management, 262(2), 215–228.	10.1016/j.foreco.2011.03.026	https://doi.org/10.1016/j.foreco.2011.03.026	The purpose of this study was to compare current and historical data (1848 - 1890), reconstructed from fire scars, to estimate differences in fuel loads, stand structure, susceptibility to fire.	2011	Fire susceptibility	X		Dendrochronology, historical, simulation modeling	Northern Sierra nevada	California	no
Wildfire in boreal forest catchments influences leaf litter subsidies and consumer communities in streams: Implications for riparian management strategies.	Musetta-Lambert, J., Muto, E., Kreutzweiser, D., & Sibley, P. (2017). Wildfire in boreal forest catchments influences leaf litter subsidies and consumer communities in streams: Implications for riparian management strategies. Forest Ecology and Management, 391, 29–41.	10.1016/j.foreco.2017.01.028	https://doi.org/10.1016/j.foreco.2017.01.028	The purpose of this study was to investigate how wildfire in a forested riparian area affects litter input and stream chemistry.	2017	Fire, LIT, NUT	X		BACI	~75 km inland from the northern shore of Lake Superior in Ontario, Canada	Ontario	no
The influence of wildfire extent and severity on streamwater chemistry, sediment and temperature following the Hayman Fire, Colorado.	Rhoades, C. C., Entwistle, D., & Butler, D. (2011). The influence of wildfire extent and severity on streamwater chemistry, sediment and temperature following the Hayman Fire, Colorado. International Journal of Wildland Fire, 20(3), 430–442.	doi.org/10.1071/WF09086	https://doi.org/10.1071/WF09086	The purpose of this study was to investigate how wildfire in a forested riparian area affects stream chemistry and sediment input.	2011	NUT, SED	X		BACI	2002 Hayman Fire	Colorado	no
. Effects of wildfire on river water quality and riverbed sediment phosphorus	Son, J.-H., Kim, S., & Carlson, K. H. (2015). Effects of wildfire on river water quality and riverbed sediment phosphorus. Water, Air, and Soil Pollution, 226(3), 1-.	10.1007/s11270-014-2269-2	https://doi.org/10.1007/s11270-014-2269-2	The purpose of this study was to assesshow wildfire in a forested riparian area affects stream water, and riverbed chemistry.	2015	NUT	X		BAI	the Cache la Poudre River basin	Colorado	no
Fire, floods and woody debris: interactions between biotic and geomorphic processes.	Bendix, J., & Cowell, C. M. (2010). Fire, floods and woody debris: interactions between biotic and geomorphic processes. Geomorphology (Amsterdam), 116(3–4), 297–304.	10.1016/j.geomorph.2009.09.043	https://doi.org/10.1016/j.geomorph.2009.09.043	The objective of this study was to investigate the effects of fire and flooding on LW input in two tributaries of Sespe Creek (Potrero John Creek and Piedra Blanca Creek) in the Los Padres national Forest in southern California.	2010	LW	X		BAI	within the perimeter of the Wolf Fire that burned in June of 2002	Southern California	no
Biological bank protection: trees are more effective than grasses at resisting erosion from major river floods.	Rood, S. B., Bigelow, S. G., Polzin, M. L., Gill, K. M., & Coburn, C. A. (2015). Biological bank protection: trees are more effective than grasses at resisting erosion from major river floods. Ecohydrology, 8(5), 772–779.	10.1002/eco.1544	https://doi.org/10.1002/eco.1544	The purpose of this study was to compare how different vegetation types (forest vs. grasses) impact bank erosion over time.	2015	Bank Stability		X	BAI	Along the Elk River between Elko, and Fernie, British Columbia, Canada	southeastern British Columbia	no
Effect of riparian vegetation on stream bank stability in small agricultural catchments.	Krzeminska, D., Kerkhof, T., Skaalsveen, K., & Stolte, J. (2019). Effect of riparian vegetation on stream bank stability in small agricultural catchments. Catena (Giessen), 172, 87–96.	10.1016/j.catena.2018.08.014	https://doi.org/10.1016/j.catena.2018.08.014	The purpose of this study was to investigate how different vegetation types (grasses, shrubs, or forest dominant) impact bank erosion over time. They also used simulation modeling combined with field work to compare the effects of different site factors (topography, soils) on bank erosion.	2019	Bank Stability		X	BAI, simulation modeling	along the Hobol River, South-Eastern Norway	Norway	no
Fuel Reduction Management Practices in Riparian Areas of the Western USA.	Stone, K. R., Pilliod, D. S., Dwire, K. A., Rhoades, C. C., Wollrab, S. P., & Young, M. K. (2010). Fuel Reduction Management Practices in Riparian Areas of the Western USA. Environmental Management (New York), 46(1), 91–100.	10.1007/s00267-010-9501-7	https://doi.org/10.1007/s00267-010-9501-7	This study is a survey of management officers across 55 national Forests (across 11 states) about the implementation of fuel reduction treatments in forested riparian areas.	2010	Fire treatments		X	Survey	Multiple	western U.S.	no

Reference	Treatment	Variables	Metrics	Notes	Results
Anderson et al., 2007	Upland stands either thinned to 198 TPA or unthinned and ranged from 500-865 TPA. Within thinned stands, 10% of the area was harvested to create patch openings. streamside buffers ranged in width from <5 m to 150 m.	Microsite, microclimate, stand structure, canopy cover	Microsite and microclimate data (humidity, temperature sensors). Stand basal area. Canopy cover was estimated through photographic techniques.	Many of the reported differences in temperature and humidity were considerable but not significant. Results for changes in upland areas not reported here.	Subtle microclimatic changes as mean temperature maxima in treated stands were 1 to 4°C higher than in untreated stands. Buffer widths greater than or equal to 15 m experienced a daily maximum air temperature above stream center of less than 1°C greater than untreated stands. Daily minimum relative humidity for buffers 15 m or greater was less than 5 percent lower than for unthinned stands. Air temperatures were significantly higher in patch openings (+6 to +9°C), and within buffers adjacent to patch openings (+3.5°C), than in untreated stands.
Bilby & Heffner, 2016	Various wind speeds for young and old-growth conifer and deciduous forests. Distance of litter delivery.	Litter input	Models were developed with site characteristics and litter release experiments from sites along Humphrey Creek in the cascade mountains of western Washington. .	Wind speeds, direction, and litter release data were collected for only one year in one area of western Washington.	The results of the linear mixed model developed by the authors showed the strongest relationship for recruitment distance was with wind speed (p<0.0001). Using this relationship the authors estimated that the effective delivery area could be increased by 67-81% by doubling wind speed. The other significant relationship was with stand age for needles (not alder leaves). Needles released from mature stands traveled further distances. This is likely due to the higher height of the canopy in the mature stands.
Deval et al., 2021	clearcut to stream, 50% shade retention, with site management operations including pile burning and competition release herbicide application.	Changes in nitrogen and phosphorus compounds.	monthly grab samples from multiple flume sites pre- and post- harvest, laboratory chemical analysis	Data was compared from pre-harvest to post experimental harvest (PH-I), and post operational harvest (PH-II)	The response in NO3 + NO2 concentrations was negligible at all treatment sites following the road construction activities. However, NO3 + NO2 concentrations during the PH-I period increased significantly (p < 0.001) at all treatment sites. Similar to the PH-I period, all watersheds experienced significant increases in NO3 + NO2 concentration during the PH-II treatment period. Overall, the cumulative mean NO3 + NO2 load from all watersheds followed an increasing trend with initial signs of recovery in one treatment watershed after 2014. Mean monthly TP concentrations showed no significant changes in the concentrations during the post-road and PH-I treatment periods. However, a statistically significant increase in TP concentrations (p < 0.001) occurred at all sites, including the downstream cumulative sites, during PH-II. Generally, OP concentrations throughout the study remained near the minimum detectable concentrations
Gravelle et al., 2009	clearcut to stream, 50% shade retention, uncut reference	Changes in nitrogen and phosphorus compounds.	monthly grab samples from multiple flume sites pre- and post- harvest, laboratory chemical analysis	Data was compared in three treatment periods: pre-harvest, under road construction, post-harvest.	Results showed significant increases in monthly mean NO3 and NO2 following clear-cut harvest treatments relative to the pre-harvest, and road construction periods. Monthly nitrate responses showed progressively increasing concentrations for 3 years after harvest before declining. Significant increases in NO3 and NO2 concentrations were also found further downstream but at values lower than those immediately downstream from harvest treatments. No significant changes of in-stream concentration of any other nutrient recorded were found between time periods and treatments except for one downstream site that showed a small increase in orthophosphate by 0.01 mg P L –1.
Hart et al., 20	(1) a no cut or fence control; (2) cut and remove a 5 x 8 m section adjacent to stream for plants < 10 cm DBH and >12 cm; and (3) 5 m fence extending underground and parallel to the stream to block litter moving downslope from reaching stream	Litter inputs, vegetation composition, topography, litter chemistry	Litter collected with lateral and vertical traps. Litter was sorted by type, time of fall, spatial source, and quantified by weight. Vegetation, LW, and Site characteristics were quantified for each plot.	This study took place within 5 contiguous watersheds located in the central Coast Range of Oregon.	Deciduous forests dominated by red alder delivered greater vertical and lateral inputs to streams than did coniferous forests dominated by Douglas-fir by 110 g/m2 (28.6–191.6) and 46 g/m (1.2-94.5), respectively. Annual lateral litter input increased with slope at deciduous sites (R2 = 0.4073, p = 0.0771) but not at coniferous sites (R2 = 0.1863, p = 0.2855). Total nitrogen flux to streams at deciduous sites was twice as much as recorded at coniferous sites. However, the nitrogen flux had a seasonal effect with the majority of N flux occurring in autumn at the deciduous sites. The authors of this study conclude by suggesting management in riparian areas consider utilizing deciduous species such as red alder for greater total N input to aquatic and terrestrial ecosystems with increased shade and large woody debris provided by coniferous species.
Kiffney & Ricl	clearcut to stream, 10 m buffer, 30 m buffer, uncut control	Litter inputs.	Litter was separated into broadleaf deciduous, twig, needles, and other (seeds, cones, and moss) categories following collection and subsequently dried and weighed using a microbalance.	Sites were measured over an 8-year period and included clear-cut (n=3), 10-m buffered reserve (n=3), 30-m buffered reserve (n=2), and uncut control (n=2) treatments.	Inputs consisting of needles and twigs were significantly lower adjacent to clearcuts compared to other treatments, while deciduous inputs were higher in clearcuts compared to other treatments. For example, one year post-treatment, needle inputs were 56x higher during the Fall into control and buffered treatments than into the clearcut. Needle inputs remained 6x higher in the buffer and control sites through year 7, and 3-6x higher in year 8 than in the clearcut sites. Twig inputs into the control and buffered sites were ~25x higher than in the clearcut sites in the first year after treatment. There was no significant difference in treatment for deciduous litter but a trend of increasing deciduous litter input in the clear cut was observed in the data. The linear relationship between reserve width and litter inputs was strongest in the first year after treatment, explaining ~57% of the variation, but the relationship could only explain ~17% of the variation in litter input by buffer width by year 8 (i.e., the relationship degraded over time).
McIntyre et al., 2018	(1) unharvested reference, (2) 100% treatment, a two-sided 50-ft riparian buffer along the entire Riparian Management Zone (RMZ), (3) FP treatment, a two-sided 50-ft riparian buffer along at least 50% of the RMZ (4) 0% treatment, clearcut to stream edge (no-buffer).	Litter inputs from litter traps situated along channel	Sorted by litter type (conifer needles, deciduous leaves, woody components, etc.). Compared between treatments by dry weight.	Authors of the study identify a lack of information on local meteorology as a primary limitation to the study. This, the authors suggest, would have allowed for a more detailed analysis including information on hydrologic mass balance.	Showed a decrease in TOTAL litterfall input in the FP (P = 0.0034) and 0% (P = 0.0001) treatments between pre- and post-treatment periods. LEAF litterfall (deciduous and conifer leaves combined) input decreased in the FP (P = 0.0114) and 0% (P <0.0001) treatments in the post-treatment period. In addition, CONIF (conifer needles and scales) litterfall input decreased in the FP (P = 0.0437) and 0% (P <0.0001) treatments, DECID (deciduous leaves) in the 0% (P <0.0001) treatment, WOOD (twigs and cones) in the FP (P = 0.0044) and 0% (P = 0.0153) treatments, and MISC (e.g., moss and flowers) in the 0% (P = 0.0422) treatment. Results for comparison of the post-harvest effects between treatments showed LEAF litterfall input decreased in the 0% treatment relative to the reference (P = 0.0040), 100% (P = 0.0008), and FP (P = 0.0267) treatments. Likewise, there was a decrease in DECID litterfall input in the 0% treatment relative to the Reference (P = 0.0001), 100% (P <0.0001), and FP (P = 0.0015) treatments. Statistical differences were only detected for deciduous inputs between the 0% treatment and the other treatments.
McIntyre et al., 2021	1) unharvested reference, 2) 100% treatment, a two-sided 50-ft riparian buffer along the entire RMZ, 3) FP treatment a two-sided 50-ft riparian buffer along at least 50% of the RMZ, (4) 0% treatment, clearcut to stream edge (no-buffer).	stream discharge, nitrogen export		Type N (non-fish-bearing streams). Hard-Rock study.	Discharge increased by 5-7% on average in the 100% treatments while increasing between 26-66% in the FP and 0% treatments Results for harvest effects on total Nitrogen export showed significant (P <0.05) treatment effects were present in the FP treatment and in the 0% treatment in the post-harvest (2-years immediately following harvest) and extended periods (7 and 8 years post-harvest) relative to the reference sites, Analysis showed an increase in total-N export of 5.73 (P = 0.121), 10.85 (P = 0.006), and 15.94 (P = 0.000) kg/ha/yr post-harvest in the 100%, FP, and 0% treatments, respectively, and of 6.20 (P = 0.095), 5.34 (P = 0.147), and 8.49 (P = 0.026) kg/ha/yr in the extended period. The authors conclude that the 100% treatment was generally the most effective in minimizing changes in total-N from pre-harvest conditions, the FP was intermediate, and the 0% treatment was least effective. At the end of the study (8 years), only one site had recovered to pre-harvest nitrate-N levels.

Murray et al., 2000	7% and 33% watershed upland harvest. Harvest extended to stream channel.	stream chemistry, stream temperatures, sediment input	Chemistry and pH tested on water grab samples; Daily max, min, and average temperatures collected with Stowaway dataloggers; Sediment change detected with turbidity meters.	Results reflect differences in stream conditions 11-15 years post-harvest only. No data collected in first decade following treatment.	10-15 years post-harvest mean maximum daily summer temperatures were still significantly higher (15.4 °C) and mean maximum daily winter temperatures were lower (3.7 °C) than in the reference streams (12.1 °C and 6.0 °C) respectively. Also, winter minimum temperatures for one of the harvested watersheds reached 1.2 °C compared to a winter minimum of 6 °C There were no significant differences in stream chemistry with the exception of calcium and magnesium being consistently higher in the unharvested reference watersheds. No detectable difference in turbidity between treatment and reference watershed streams 10-5 years post-treatment. The stream temperature changes were significant but did not exceed the 16 ºC threshold used as a standard for salmonid habitat.
Six et al., 2022	Clearcut with no leave trees or retention buffer (CC), clearcut with leave trees (CC w/LT; retention of 5 trees per hectare/2 trees per acre), and clearcut with 15 m wide retention buffer (CC c/B) and two uncut references (REF 1, and 2) along headwater streams	Litter input, LW recruitment	litter traps, In-stream LW volume, weight, and counts.	No replication of treatment sites. Data was analyzed with descriptive and graphical representation only.	Results showed a reduction of canopy cover from 91.4% to 34.4% in the clearcut treatment with no leave trees, from 89.8% to 76.1% in the clearcut treatment with leave trees, and from 89.5% to 86.9% in the clearcut treatment with the 15 m retention buffer. Post harvest litter delivery decreased for the clearcut with no leave trees but increased for both the clearcut with leave tree and clear cut with retention buffer.
Vanderbilt et al., 2003	Datasets (ranging from 20-30 years) from six watersheds in the H.J. Andrews Experimental Watershed.	Nitrogen concentration in streams, precipitation patterns	regression analysis of annual N inputs and outputs with annual precipitation and stream discharge to analyze patterns.	These results come from a coastal climate of western Oregon. The authors warn that the controls on in stream N concentrations will likely differ in different regions.	Total annual discharge was a positive predictor of annual DON export in all watersheds with r2 values ranging from 0.42 to 0.79. In contrast, significant relationships between total annual discharge and annual export of NO3-N, NH4-N, and PON were not found in all watersheds. DON concentrations increased in the fall in every watershed. The increase in concentration began in July or August with the earliest rain events, and peak DON concentrations occurred in October through December. DON concentrations then declined during the winter months. The authors conclude that total annual stream discharge was a positive predictor of DON output suggesting a relationship to precipitation.
Yang et al., 2021	Young stands with high shrub cover (> 50%) masticated to < 10% shrub cover. trees removed to a target basal area range of 27–55 m2 ha-1.	Drought, nutrients, dissolved organic carbon	Stream water samples grab samples and chemical analysis	Because of difficulties with accessibility due to weather-related phenomena (particularly during winter months), snowmelt and soil samples were restricted to the lower elevation site.	Drought alone altered DOC in stream water, and DOC:DON in soil solution in unthinned (control) watersheds. The volume-weighted concentration of DOC was 62% lower, and DOC:DON was 82% lower in stream water in years during drought than in years prior to drought. Drought combined with thinning altered DOC and DIN in stream water, and DON and TDN in soil solution. For stream water, volume-weighted concentrations of DOC were 66- 94% higher in thinned watersheds than in control watersheds for all three consecutive drought years following thinning. No differences in DOC concentrations were found between thinned and control watersheds before thinning. Watershed characteristics inconsistently explained the variation in volume-weighted mean annual values of stream water chemistry among different watersheds
Yeung et al., 2019	Range of forest harvest intensities	Litter inputs, CPOM in streams	stream temperature, streamflow, litter traps, CPOM decay rates	Authors point out that model results are primarily applicable to stream reaches similar to those used in the study and may not be suitable for streams where large wood is a dominant structure retaining CPOM.	The simulation predicted that litter input reduction from timber harvest was the strongest control on CPOM in streams relative to streamflow and temperature variability. The effects of litterfall reduction were at least an order of magnitude higher than streamflow increases in depleting in-stream CPOM. Significant CPOM depletions were most likely when there was a 50% or greater reduction in litterfall following harvest. The caveat of this study is that it did not include LW dynamics in preserving CPOM post-harvest. As other studies have shown, harvest can increase in-stream LW, and in-stream LW can act as a catchment for CPOM.

Reference	Treatment	Variables	Metrics	Notes	Results
Anderson & Meleason, 2009	Buffer averaging 69 m adjacent to thinning and a 0.4 patch opening; variable width buffer averaging 22 m adjacent to thinning and a 0.4 patch	Instream wood load, understory vegetation cover	Percent cover of LW in streams and in riparian area, %cover shrubs, herbs, moss.		LW changes were non-significant, decrease in treatment reaches with greatest pre-treatment values 5 years post-treatment caused homogenization of LW. Gaps (patch openings) showed the highest changes increase in herbaceous cover, decrease in shrub cover. Moss cover increased in thinned areas but decreased in gaps. LW and vegetation changes insensitive to treatment buffers > 15 m.
Bahuguna et al., 2010	Two buffer widths on each side of the stream (10 m and 30 m) with upland clearcuts, and an unharvested control.	LW, Stand Structure, mortality	Strip plot sampling method running parallel to the stream to collect data on stand metrics.	Experimental design included 3 replicates of each treatment. Data was collected annually for one year pre- and 8 years post-treatment. Vancouver, B.C.	Following harvest, 11% of initially standing timber was blown down in the first and second years in the 10 m buffer, compared to 4% in the 30 m buffer, and 1% in the unharvested controls. Small diameter trees were significantly more represented in streams - 77% of LW was in the 10 cm - 20 cm diameter class while the mean diameter of standing trees in riparian buffers was 30 cm. By 8 years post-harvest, a significant amount of
Benda et al., 2016	Simulated treatments of single or double entry thinning with and without a 10-m no cut buffer, with and without mechanical tipping of stems into	instream LW volume	ORGANON growth models simulated secondary forest growth. The model was run for 100 years in 5-year time steps.	used the reach scale wood model (RSWM) developed for the Alcea watershed in central coastal Oregon. Data was sourced from FIA.	Single entry thinning reduced in-stream wood by 33 and 80% after a century, relative to reference streams when one and both sides of the channel were harvested. Adding a 10 m buffer reduced total loss to 7 an 14%. Mechanical tipping of 14 and 12% of cut stems were sufficient in offsetting the loss of instream wood without and with buffers. Double entry thinning without a buffer resulted in 42 and 84% loss of in stream wood relative
Burton et al., 2016	70-m buffer representative of one site potential tree, 15-m buffer, 6-m buffer. Outside of buffer, all treatment stands were thinned first to 200 trees per	LW recruitment, In stream wood volume, biomass, and	LW volume, LW characteristics and source evidence, reach and stream characteristics.	Wood surveys were carried out at four times during the study: (1) prior to the first thinning, (2) five years after the first thinning, (3) 9-13 years after the first	In-stream wood volume increased significantly with drainage basin area, for every 1-ha increase in drainage basin area, wood volume increased by 0.63%. LW volume was slightly higher in the streams adjacent to 6 m buffers than in streams bordered by 15 and 70 m buffers. The higher volume of wood in the 6 m buffers began 5 years after the first harvest and maintained through 1 year after the second harvest (end of study). . 82% to
Chen et al., 2005	All harvested streams were clearcut to stream edge. Wildfire streams had no post-fire harvest	Instream wood load, biomass, carbon pool	LW count, volume, decay class, size		LW volume, biomass, and carbon pools were significantly higher in streams adjacent to areas recently disturbed by timber harvest (~10 years) or wildfire (~40 years) than in streams passing through old-growth forests. There was no significant difference in in-stream LW between old-growth riparian areas and areas harvested > 30 years ago. The wildfire sites had significantly higher LW values than both the harvested sites.
Chen et al., 2006	A total of 35 sites with stream orders ranging from 1-5 (grouped into 4 stream size categories (I = first order; II = second to third order; III = third to	LW, defined as having a diameter of > 0.1 m and a length > 1.0 m.	LW size, volume, density, and biomass. Multiple stream channel features obtained from readily available physiographic	Study sites were selected based on the following criteria. (1) the streams were in areas of intact mature riparian forests (>80 years); (2) the stream side forests	Results from this study show that LW size, volume, and biomass generally increased with increasing stream size. For example, the mean LWD diameter in stream size I (16.4 cm) was lower than that in stream size III (20.6 cm) and IV (20.5 cm), respectively. Mean LW length also increases with stream size from 2.3 m in size I, 2.9 m in size II, 3.1 m in size III, and 3.9 m in size IV. Stream IV had the highest mean volume (0.18 m3),
Ehinger et al., 2021	1) Buffers encompassing the full width (50 feet), 2) <50ft buffers, 3) Unbuffered, harvested to the edge of the channel, and 4) Reference sites in			Soft Rock study. Only descriptive statistics were applied for changes in stand structure and wood loading. Small sample sizes.	There was little post-harvest large wood input in reference sites: an average of 4.5 pieces and 0.34 m3 of combined in- and over-channel volume per 100 m of channel. In contrast, the full buffer sites and <50 ft buffer sites received an average of 23 and 10 pieces/100 m and 2.3 and 0.7 m3/100 m of large wood, respectively. Piece counts remained stable in the reference sites through year 3 post-harvest, increased in the full buffer
Fox & Bolton, 2007	LW values from 150 stream segments located in unmanaged watersheds, across all of Washington State	Instream LW, geomorphology, forest zone, disturbance	Descriptive statistics for LW volume and quantity, channel geomorphology, forest habitat type, disturbance regimes.	the authors warn that these values for reference conditions are only applicable to streams with bank-full widths between 1 and 100 m, gradients between 0.1% and	Results showed that in-stream wood volume increased with drainage area and as streams became less confined. Bank full width (BFW) was the single greatest predictor of in-stream wood volumes relative to other predictor variables. However, this result comes with the caveat that other processes and geomorphologies (e.g., channel bed form, gradient, confinement) are also important in the mechanisms for wood recruitment,
Gomi et al., 2001	Five management or disturbance regimes: old growth (OG), recent clear-cut (CC; 3 years), young conifer forest (YC; 37 years after clear-cut), young	LW quantity and distribution, sediment quantity and distribution,	LW counts, LW characteristics, stream characteristics.	Results are highly variable among treatments	In-channel numbers of LW pieces were significantly higher in YC and CC sites when compared to OG, YA, and LS sites. The number of LW pieces was highest in YC streams even though logging concluded 3 decades prior to sampling. LW volume per 100 m of stream length in YC was twice that in OG. The total volume of LW per 100 m associated with CC channels was half that in OG channels. The authors conclude (i) inputs of logging slash
Hough-Snee et al., 2016	In-stream wood volume and frequency were quantified across multiple sub basins.	LW frequency and volume, hydrologic and geomorphic	Models were calibrated with site characteristics from multiple riparian stands in the Columbia River Basin.	Results show a high level of variability between sub basins studied. The overall model shows site (watershed) was an important predictor.	In-stream wood volume and frequency were distinctly different across all seven sub-basins. According to random forest (RF) models, mean annual precipitation, riparian large tree cover, and individual watershed were the three most important predictors of wood volume and frequency, overall. Sinuosity and measures of streamflow and stream power were relatively weak predictors of wood volume and frequency. Final RF
Hyatt & Naiman, 2001	LW data was collected from multiple sites in the Queets River Watershed.	LW in stream and in riparian forests.	Increment cores from in-stream LW were cross-dated to estimate the time LW was recruited. LW pieces in decay	The depletion constant was developed for a large, mostly alluvial river and should probably not be applied to smaller streams	Results from this study indicate that the half-life of stream LW to be approximately 20 years, suggesting that current LW will either be exported, broken down, or buried withing 3 to 5 decades (for conifers). Hardwoods were better represented in riparian forests than as in-stream LW, and conversely, conifers were better represented as in-stream LW than in adjacent forests suggesting that LW originating from hardwoods is
Jackson & Wohl, 2015	In-stream wood volume and frequency were quantified along 33 pool-riffle or plane-bed stream reaches in the Arapaho and Roosevelt National Forests	Sediment storage, channel geometry, in-stream wood load, and forest	Wood loads, wood jam volumes, log jam frequencies, residual pool volume, and fine sediment storage around wood, stand age,	Old growth defined as forests ≥ 200 years. Age range of young forests not reported. Sample sizes include 10 old-groth and 23 younger forests.	Results indicated that channel wood load (OG = 304.4 + 161.1; Y = 197.8 + 245.5 m3 /ha), floodplain wood load (OG = 109.4 + 80; Y = 47.1 + 52.8 m3 /ha), and total wood load (OG = 154.7 + 64.1; Y = 87.8 + 100.6 m3 /ha) per 100 m length of stream and per unit surface area were significantly larger in streams of old-growth forests than in young forests. Streams in old-growth forests also had significantly more wood in jams, and
Jackson et al., 2001	3 unthinned riparian buffers; 1 with a partial buffer; 1 with a buffer of non-merchantable trees; and 6 were clearcut to the stream edge. Buffers ranged from	Instream LW, particle size, surface roughness	LW as functional and nonfunctional (not altering flow hydraulics). Particle size distributions.	Data collected for only 1-year pre- and 1-month post-harvest. These results only describe immediate effects of harvest on stream conditions.	Increased slash debris (LW) provided shade for the harvested streams but trapped sediments and prevented fluvial transport. The percentage of fine particles increased from 12 to 44% because of bank failure and increased surface roughness. This was a short-term study on small headwater streams. Sediment and LW conditions in the unharvested and buffered streams remained relatively unchanged during the study.
Liquori, 2006	Data were collected from 20 riparian buffer sites that had all been clearcut within three years of sampling with standard no-cut 25 ft or 50-100 ft	Tree and tree fall characteristics, Site characteristics	Tree characteristic data estimated cause of mortality, and distance to the stream. Tree recruitment probability curves		Within no-cut buffers windthrow caused mortality was up to 3 times greater than competition induced mortality for 3 years following treatment Tree fall direction was heavily biased towards the channel regardless of channel or buffer orientation and tree fall probability was highest in the outer areas of the buffers (adjacent to the harvest area). Tree fall rates and direction were also heavily biased by species with western hemlock
Martin & Grotefendt, 2007	Buffer widths a minimum of 20 m. Multiple buffer widths and harvest intensities.	Instream wood load, stand mortality	Counts of downed wood, tree stumps, stand characteristics, instream wood from aerial photographs taken post-logging	Stand and stream characteristic, and LW data was surveyed from aerial photographs.	Results showed significantly higher mortality, significantly lower stand density, and a significantly higher proportion of LW recruitment from the buffer zones of the treatment sites than in the reference sites. Differences in mortality for the treatment sites were similar to the reference sites for the first 0-10 m from the stream (22% increase). However, mortality in the outer half of the buffers (10-20 m) from the stream in the
May & Gresswell, 2003	Survey of LW in three second-order streams and the mainstem of the North Fork of Cherry creek.	LW, delivery mechanism	LW > 20 cm diameter, and >2 m length was categorized by 4 delivery mechanisms, Delivery process, disturbance type, and	Although mean age of Douglas-fir trees was identified to be excess of 300 years old, further information on differences in stand structure or development stage	Processes of slope instability were shown to be important conveyors of wood from upland forests to small colluvial channels. In the larger alluvial channels, windthrow was found to be the dominant recruitment process from adjacent riparian area. 80% of total wood pieces and 80% of total wood volume recruited to colluvial streams originated from trees rooted within 50 m of the channel. In the alluvial channel, 80% of the
McIntyre et al., 2021	(1) unharvested reference, (2) 100% treatment, a two-sided 50-ft riparian buffer along the entire Riparian Management Zone (RMZ), (2) FP			Hard Rock Study Physical constraints such as a lack of suitable low gradient reaches and/or issues with accessibility related to weather limited downstream	Large wood recruitment to the channel was greater in the 100% and FPB RMZs than in the reference for each pre- to post-harvest time interval. Eight years post-harvest mean recruitment of large wood volume was two to nearly three times greater in 100% and FPB RMZs than in the references. Annual LW recruitment rates were greatest during the first two years, then decreased. However, these differences were not significant between
Meleason et al., 2003	Multiple buffer widths and upland harvest intensities	Change in instream wood load over time	Simulation metrics for forest growth, tree breakage, and in-channel process	The authors mention a potential limitation of growth models in that they lack the ability to predict responses to novel climatic conditions which are	Simulation results predicted clear-cut to stream accumulated little LW immediately following treatment and little change over time. Maximum in-stream LW loads were predicted for streams with no-cut buffers >30 m for 500-year-old forests (500 years post treatment). Streams with 6 m wide buffers predicted only 32% of pre-harvest standing LW loads after 240 years. Forest plantations with > 10 m buffer widths contributed minimal
Nowakowski & Wohl, 2008	History of regulated and unregulated timber harvest practices.	Instream wood volume	LW volume, LW characteristics source evidence, buffer widths, reach and stream characteristics.		In-stream LW was 2-3 times lower in a watershed with a history (>100 years) of timber harvest (1.1 m3/100 m) when compared to unmanaged reference watersheds (3.3 m3/100 m). Valley characteristics (elevation, forest type, forest stand density, etc.) consistently explained more of the variability in wood load (42-80%) than channel characteristics (21-33%; reach gradient, channel width, etc.). Across all streams, the highest
Reid & Hassan, 2020	Clearcut to stream and buffer widths that range from 1-70 m. Models were developed for 3 harvest scenarios (1: no-harvest; 2 partial loss of riparian forests;	Instream LW	Models were calibrated with long-term data for site and LW characteristics in treatment reaches dating back to 1973.	One caveat of this model is it doesn't account for as much variability on stream configuration or valley morphologies that are likely to affect LW storage.	Results of the model show evidence that wood storage in streams of harvested reaches its minimum value in 50 years or more following loss of LW input, decay, and export of current stock. Recovery of LW volume in-streams following harvest is estimated to take approximately 150-200 years. The pattern and intensity of the harvesting operation had little effect on LW loss and recovery times but did affect the estimated magnitude of
Schuett-Hames & Stewart, 2019a	Buffer prescriptions for standard shade rule (a 30-ft no-cut buffer width, and thinning 30-75 ft from the stream), and all available shade rule (requires	LW recruitment, instream wood volume, mortality, stand structure	LW volume, LW characteristics, LW source evidence, reach and stream characteristics, basin metrics, stand metrics	Short-term study. Results only for 5 years post-harvest. The authors note that LW recruitment is a process that can change over decadal time scales.	Results showed cumulative wood recruitment from tree fall over the five-year post-harvest interval was highest in the standard shade rule (SR) group, lower in the all-available-shade rule (AAS) group and lowest in the reference (REF) group. The SR and AAS rates by volume were nearly 300% and 50% higher than the REF rates, respectively. Most recruiting fallen trees originated in the first 30 feet (76%, 72%, and 64% for the REF,
Schuett-Hames et al., 2011; Schuett-Hames & Stewart, 2019b	Clearcut to stream with 30-foot equipment exclusion zone, and 50-foot no-cut buffers	LW, mortality, stand structure, canopy cover	QMD, basal area, tree fall rates, instream LW counts and volume, canopy percentage from densiometer.	1) Substantial variability among sites. 2) Due to scale of study, results only applicable to immediate vicinity of buffer treatment.	10 years post treatment, 50-foot buffer mortality stabilized, cumulative 14.1% reduction in basal area, Reference stands increased in basal area by 2.7% over the 10 years. 10-year cumulative LW recruitment into channels were double that of the reference stands 10-year canopy cover of the 50-foot buffer recovered to similar percentages as the reference stands 10-year cumulative canopy cover of CC was 71.5% due to
Sobota et al., 2006	Data was collected at 15 riparian sites throughout the pacific northwest and the Intermountain West	Tree characteristics, forest structural variables and	Stand density, basal area, and dominant tree species by basal area; Active channel width and valley floor width.	Bias in landform types between slope categories. Effects of catastrophic disturbance regimes in large rivers not included in model.	The strongest correlations of tree fall direction were with valley constraint. When grouped by species, the individual trees showed a stronger tendency to fall towards the stream when hillslopes were >40%. When field data was integrated into the recruitment model, results showed that stream reaches with steep side slopes (>40%) were 1.5 to 2.4 times more likely to recruit LW into streams than in moderately sloped (< 40%)
Teply et al., 2007	25-ft no-cut buffer, with additional 50-feet requiring 88 trees per acre.	Instream wood load	Simulation metrics for forest growth, tree breakage, and in-channel process	The simulation evaluated both a harvest and a no-harvest scenario to predict mean in-stream LW loads after 30, 60, and 100 years	Simulation results predict a 25-foot no-cut buffer, with an additional 50-foot (25 –75 feet from the high watermark) zone requiring retention of 88-trees-per-acre were sufficient in maintaining no significant change in in-stream LW loading relative to unharvested reference streams.
Wing & Skaugset, 2002	LW loads and site characteristics were collected from 3793 stream reaches in western Oregon State (west of Cascade crest).	LW pieces, LW key pieces, LW volume	LW abundance, land use history, land ownership, site level attributes	Results presented here are only for forested streams ("tree 3" in text). Landownership was the strongest predictor in some models, but this	For in stream LW volume, stream gradient was the most important explanatory variable with the split occurring for stream reaches with gradients less than 4.7% averaging 11.5 m3 , which was less than half of the average found at higher gradient reaches (25.2 m3); in this model the stream gradient split explained 11% of the variation observed of instream LW volume. For LW pieces in forested stream reaches, bankfull channel

Reference	Treatment	Variables	Metrics	Notes	Results
Bywater-Reyes et al., 201	Harvest had a mixture of intensities including clearcut to stream and clearcut with 15 m buffers.	Sediment concentration, basin lithology, geomorphology	Channel, stream, and riparian area characteristics sourced from a mixture of LiDAR and management data.	This study analyzed 6 years of data from the Trask River Watershed in Northeastern Oregon and included data from harvested and unharvested sub-catchments underlain by heterogenous lithologies.	Results from this study indicate that site lithology was a first order control over suspended sediment yield (SSY) with SSY varying by an order of magnitude across lithologies observed. Specifically, SSY was greater in catchments underlain by Siletz Volcanics (r = 0.6), the Trask River Formation (r = 0.4), and landslide deposits. In contrast, the site effect had a strong negative correlation with percent area underlain by diabase (r = 0.7), with the lowest SSY associated with 100% diabase independent of whether earthflow terrain was present. Sites with low SSY and underlain by more resistant lithologies were also resistant to harvest-related increases in SSY. The authors conclude that sites underlain with a friable lithology (e.g., sedimentary formations) had SSYs an order of magnitude higher, on average, following harvest than those on more resistant lithologies (intrusive rocks).
Bywater-Reyes et al., 2018	long-term data (60 years) of sediment, discharge, weather, and disturbance.	Sediment yield, discharge history, physiography.	suspended sediment concentration involved using either vertically integrated storm-based grab samples, or discharge-proportional composite samples.	The authors caution that the high variability of sediment yield over space and time (~0.2 - ~953 t/km2) indicates that the factors tested in this study should be tested more broadly to investigate their utility to forest managers.	The results of this study show that watershed slope variability combined with cumulative annual discharge explained 67% of the variation in annual sediment yield across the approximately 60-year data set. The results, however, show that annual sediment yields also moderately correlated with many other physiographic variables and the authors caution that the strong relationship with watershed slope variability is likely a proxy for many processes, encompassing multiple catchment For the relationships between disturbance and sediment yield the authors conclude that the few anomalous years of high sediment yield occurred in watersheds with high slope variability and within a decade of forest management and a large flood event.
Hatten et al., 2018	Data from pre restriction and post Oregon BMPs prescriptions for non-fish bearing streams. BMPs: no buffer in non-fish-bearing streams with equipment exclusion zones, and a 15 m no-cut-buffer in fish-bearing streams	suspended sediment concentrations (SSC)	suspended sediment, stream discharge, and daily precipitation	Phase I harvest: 2009 harvest of upper half of watershed. Phase II harvest: 2015 harvest of lower half of watershed.	Methods used in 1966 to harvest the same watershed (no buffer, road construction, broadcast burning) resulted in an approximate 2.8-fold increase in SSC from pre- to post- Harvest. In the contemporary study both the mean and maximum SSC were greater in the reference catchments (FCG and DCG) compared to the harvested catchment (NBLG) across all water years. In NBLG the mean SSC was 32 mg L−1 (63%) lower after the Phase I harvest and 28.3 mg L−1 (55%) lower after the Phase II harvest when compared to the pre-harvest concentrations. Compared to the reference watersheds, the mean SSC was 1.5-times greater in FCG (reference) compared to NBLG during the pre-harvest period. After Phase I harvest the mean SSC in FCG was 3.1-times greater and after Phase II harvest was 2.9-times greater when compared to the SSC in the harvested watershed. The authors conclude that contemporary harvesting practices (i.e., stream buffers, smaller harvest units, no broadcast burning, leaving material in channels) were shown to sufficiently mitigate sediment delivery to streams, especially when compared to historic practices.
Karwan et al., 2007	clearcut of the watershed area of by 50%, partial cut of 50% canopy removal, timber road construction Riparian zone harvest followed Idaho FPA rules.	Total suspended solid (TSS) yields	Monthly total suspended solid readings from multiple flume locations for pre-, and post-harvest, and pre- and post- road construction.		A significant and immediate impact of harvest on monthly sediment loads in the clear-cut watershed (p = 0.00011), and a marginally significant impact of harvest on monthly sediment loads in the partial-cut (p = 0.081) were observed. Total sediment load from the clearcut over the immediate harvest interval (1-year post-harvest) exceeded predicted load by 152%; however, individual monthly loads varied around this amount. The largest increases in percentage and magnitude occurred during snowmelt months, namely April 2002 (560%) and May 2002 (171%). Neither treatment showed a statistical difference in TSS during the recovery time, 2-4 years post-harvest (clearcut: p = 0.2336; partial-cut: p = 0,1739) compared to the control watersheds. Road construction in both watersheds did not result in statistically significant impacts on monthly sediment loads in either treated watershed during the immediate or recovery time intervals.
Litschert & MacDonald, 20	Data collected from 4 NF of Nort CA. ~200 harvest sites near riparian zones with 90 m and 45 m buffer widths.	Sediment delivery pathway frequency and characteristics.	Pathway length, width, origins, and connectivity of sediment delivery pathways to streams.	Authors mention a caveat to the results of the study in that there is a potential of underestimating the frequency of rills and sediment plumes as sites recover.	Only 19 of the 200 harvest units had sediment development pathways and only 6 of those were connected to streams and five of those originated from skid trails. Pathway length was significantly related to mean annual precipitation, cosine of the aspect, elevation, and hillslope gradient.
Macdonald et al., 2003a	low-retention = removed all timber >15 cm DBH for pine and > 20 cm DBH for spruce within 20 m of the stream; high-retention = removed all timber > 30 cm within 20 m of the stream.	suspended sediment yields, stream discharge	Discharge rate and total suspended sediments (TSS) collected using Parshall flumes	Only 1-year pre-harvest data was collected to generated predicted TSS and discharge values post-harvest.	Immediately following harvest, TSS concentrations and discharge rates increased above predicted values for both treatment streams. Increased TSS persisted for two-years post-harvest in the high-retention treatment, and for 3-years in the low-retention. This study shows evidence that harvest intensity (low vs. high retention) is proportional to the increase in stream discharge, TSS concentrations, and recovery time to pre-harvest levels. The authors speculate that the treatment areas may have accumulated more snow (e.g., more exposed area below canopy) than in the control reaches leading to the increase in discharge.
McIntyre et al., 2021	1) unharvested reference, 2) 100% treatment, a two-sided 50-ft riparian buffer along the entire RMZ, 3) FP treatment a two-sided 50-ft riparian buffer along at least 50% of the RMZ, (4) 0%	stream discharge, turbidity, and suspended sediment export.		Type N (non-fish-bearing streams). Hard-Rock study.	Discharge increased by 5-7% on average in the 100% treatments while increasing between 26-66% in the FP and 0% treatments. Results for water turbidity and suspended sediment export (SSE) were stochastic in nature and the relationships between SSE export and treatment effects were not strong enough to confidently draw conclusions. The authors conclude that timber harvest did not change the magnitude of sediment export for any buffer treatment.
Mueller & Pitlick, 2013	The study used sediment concentration data from 83 drainage basins in Idaho and Wyoming.	Sediment concentration, basin lithology, geomorphology	Sediment concentration distribution, geomorphology, and weather data from multiple sources.		The strongest correlation of in stream sediment supply was with lithology relative softness. Bankfull sediment concentrations increased by as much as 100-fold as basin lithology became dominated by softer sedimentary and volcanic rock. Relief (elevation), basin sideslope, and drainage density showed little correlation strength with bankfull sediment supply.
Puntenney-Desmond et a	Variable retention buffers with clearcut.	surface and subsurface runoff rates, sediment.	Simulation metrics calibrated with runoff and sediment samples from sample area. Precipitation calibrated for 100-year-rain events.	Differences in sediment yield not statistically significant.	Surface and shallow subsurface runoff rates were greatest in the buffer areas than in the harvested areas or in the harvest-buffer interfaces especially during dry conditions. The authors speculate this was likely due to the greater soil porosity in the disturbed, harvested areas. Sediment concentration in the runoff, however, was approximately 15.8 times higher for the harvested area than in the riparian buffer, and 4.2 times greater than in the harvest-buffer interface. Total sediment yields from the harvested area (runoff + sediment concentration) were approximately 2 times greater than in the buffer areas, and 1.2 times greater in the harvest-buffer interface, however this difference was not significant.
Rachels et al., 2020	harvested following the current Oregon Forest Practices Act policies and BMPs	proportion of sediment from sources	Sediment collected in traps; sourced using chemical analysis	limited sample size (1 treatment, 1 paired reference watershed) and does not incorporate the effects of different watershed physiography on sediment erosion.	The proportion of suspended sediment sources were similar in the harvested (90.3 + 3.4% from stream bank; 7.1 + 3.1% from hillslope) and unharvest (93.1 + 1.8% from streambank; 6.9 + 1.8% from hillslope) watersheds. In the harvested watersheds the sediment mass eroded from the general harvest areas (96.5 + 57.0 g) was approximately 10 times greater than the amount trapped in the riparian buffer (9.1 + 1.9 g), and 4.6 times greater than the amount of sediment collected from the unharvested hillslope (21.0 + 3.3 g).
Safeeq et al., 2020	Long term (51 years) effects of clearcut to stream followed by broadcast burn.	streamflow, sediment transport	Historical streamflow data, precipitation data, sediment grab samples for bedload and suspended sediment.	Data compared one treatment watershed and one control watershed across 51+ years.	The results for post-treatment sediment yields showed suspended load declined to pre-treatment levels in the first two decades following treatment, bedload remained elevated, causing the bedload proportion of the total load to increase through time. Changes in streamflow alone account for 477 Mg/km2 (10%) of the suspended load and 113 Mg/km2 (5%) of the bedload over the post-treatment period. Increase in suspended sediment yield due to increase in sediment supply is 84% of the measured post-treatment total suspended sediment yield. In terms of bedload, 93% of the total measured bedload yield during the posttreatment period can be attributed to an increase in sediment supply. The authors conclude that Following harvest, changes on streamflow alone was estimated in being responsible for < 10% of the resulting suspended sediment transported into streams, while the increase in sediment supply due to harvest disturbance was responsible for >90%.

Wise, 2010	Streamflow patterns derived from instrumental data and from reconstructed tree-ring chronologies were compared with other previously reconstructed rivers in similar climates.	Streamflow	Dendrochronology, historical data records, seasonal patterns	The reconstruction model developed for the analysis explained 62% of the variance in the instrumental record after adjustment for degrees of freedom.	Results showed evidence that droughts of the recent past are not yet as severe, in terms of overall magnitude, as a 30-year extended period of drought discovered in the mid-1600s. However, in terms of number of individual years of < 60% mean-flow (i.e., low-flow years), the period from 1977-2001 were the most severe. Considering the frequency of consecutive drought years, the longest (7-year-droughts), occurred in the early 17th and 18th centuries. However, the 5-year drought period from 2000-2004 was the second driest period over the 415-year period examined.
Wissmar et al., 2004	Data sourced from management records and geospatial data to identify high erosion-risk areas.	Sediment, weather, stand characteristics, landscape factors	unstable soils, immature forests, roads, critical slopes for land failure, and rain-on-snow events		The highest-risk areas contained a combination of all landscape cover factor combinations (rain-on-snow zone, critical failure slope, unstable soil, immature forests, and roaded areas). The lowest risk categories contained only rain-on-snow zones, and critical failure slopes. Roaded areas and unstable soils were only present in risk categories 3-6.

Reference	Treatment	Variables	Metrics	Notes	Results
Bladon et al., 2016	15 m buffer with a minimum of ~3.7 m^2 conifer basal area retained for every 300 m length of stream). Historical data with no streamside vegetation maintenance (I.e., no	Stream temperature	7-day moving mean stream temperature, daily mean stream temperature, and diel stream temperature fluctuation. Data was recorded with Tidbit data loggers.	The authors caution that the streams in this study have potential for a muted stream temperature response following harvest relative to other regions because of the (1) north-south stream orientation (2) steep	Under the contemporary Oregon Forest Practices Act there was no significant changes in the 7-day moving mean of daily maximum stream temperature, mean daily stream temperature, and diel stream temperature for 3 years following harvest when analyzed across all sites for all summer months (July – September. There was a significant increase in the 7-day moving maximum temperature from pre- to post-harvest values when data was constrained to the
Bladon et al., 2018	Buffer widths at harvested sites varied but averaged 20 m on either side of streams.	Stream temperature, lithology	the 7-day moving average of daily maximum stream temperature adjacent to and downstream of harvest.	Conducted at 3 paired watershed studies on the coast and western Cascades of Oregon. The pre-harvest relationship in stream temperatures for paired sites were used to create predicted changes in stream	Results showed an increase in stream temperatures beyond the 95% predictive interval (PI) at 7 of the 8 sites within harvest areas. 4 of these 7 sites exceeded the PI between 22 and 100% of the time (all summer months for 3 years following harvest). In the reaming 3 sites, exceedance only occurred between 0 and 15% of the time. There was no evidence of elevated stream temperatures beyond the predicted intervals in any of the downstream sites following
Cole & Newton, 2013	clearcut to stream, partial buffer (12 m width on predominant sun-side),), Oregon state BMP (15-30 m no-cut buffer both sides)	Stream temperature	Controlled for yearly fluctuations in temperatures by analyzing the difference in stream temperature entering and exiting the reach with digital temperature data loggers	Stream temperature data collected for 2 –years prior and 4 to 5 years following harvest. Unharvested control sites were located downstream of treatment sites. Treatment applied to four small fish-bearing streams.	Results showed the most significant increases in daily maximum, and mean, and diel fluctuations in temperatures post-harvest for all no tree buffers. Changes to daily maxima ranged from -0.11 to 3.84 °C, and changes to daily minimum ranged from -1.12 to 0.49 °C. The no tree buffers also showed small but significant changes below predicted summer minima between -1.12 and -0.49 °C. The partial buffer units varied in their response to treatment
Cupp & Lofgren, 2014	the "all available shade" rule (ASR), and the standard rule (SR) in eastern WA. ASR: requires retention of all available shade within 75 feet of the stream. SR: some harvest is allowed within the 75-foot buffer depending on elevation and pre-harvest canopy cover.	Canopy closure, shade measurements, stream temperature	Hand-held densiometer (canopy closure), self-leveling fisheye lens digital camera (shade), temperature data loggers	Sites were between 65-100 years old and were situated along second to fourth order streams with harvest-regenerated or fire-regenerated forests. Reference reaches were located upstream from treatment reaches where harvest was applied.	Results showed post-harvest shade values decreased in SR sites (mean effect of -2.8%, p = 0.002), as did the canopy closure values (mean effect of -4.5%, p < 0.001). Shade and canopy closure values did not significantly change in the ASR sites. Mean shade reduction in the SR treatment sites exceeded the mean shade reduction in the ASR sites by 3%. Canopy closure reduction was also greater in the SR sites than in the ASR sites by a mean of 4%. Site seasonal means of daily maximum stream temperature treatment responses in the first two years following harvest ranged from - 0.7 °C to 0.5 °C in the ASR reaches and from -0.3 to 0.6 in the SR reaches. Site seasonal mean post-harvest background responses in reference reaches ranged from - 0.5 °C to 0.6 °C in the first two years following harvest. Mean daily maximum stream temperature increased 0.16 °C in the SR harvest reaches, whereas stream temperatures
Ehinger et al., 2021	1) Buffers encompassing the full width (50 feet), 2) <50ft buffers, 3) Unbuffered, harvested to the edge of the channel, and 4) Reference sites in unharvested forests.			Soft Rock study. Only descriptive statistics. Small sample sizes.	Mean canopy closure decreased in the treatment sites from 97% in the pre-harvest period to 75%, 68%, and 69% in the first, second, and third post-harvest years, respectively, and was related to the proportion of stream buffered and to post-harvest windthrow within the buffer. The seven-day average temperature response increased by 0.6°C, 0.6°C, and 0.3°C in the first, second, and third post-harvest years, respectively. During and after harvest, mean monthly water temperatures were higher, but equaled or exceeded 15.0°C only in 2 treatment sites by up to 1.8°C at one site and by 0.1°C at another. None of the three REF sites exceeded 15°C during the study.
Gravelle & Link, 2007	50% of the drainage area clearcut to stream edge, thinned to a 50% target shade removal in Fall 2001, and an unimpacted control. Riparian buffer zones were	stream temperatures at the headwater streams immediately adjacent to treatments, and downstream in larger fish-bearing	Stream temperature data collected from digital sensors.	for the non-fish-bearing, headwater sites pre-treatment data was only collected one season prior to treatment.	In general, the downstream sites showed a cooling effect between −0.2 and −0.5 °C. The estimated cooling effect could not be attributed to any cause (e.g., increase in water yield), but the authors conclude that there was no post-harvest increase in peak summer temperatures at the downstream sites. For streams immediately adjacent to the clearcut treatment (headwater streams) a significant increase in temperature was detected at 2 sites ranging between 0.4 and
Groom et al., 2011a	Private site FPA rules are 15 and 21 m wide on small and medium fish-bearing streams of limited entry. State sites followed a 52 m wide buffer of limited entry. FPA = 6 m	Stream temperature	Stream temperature collected with digital temperature sensors within harvested areas before and after treatment.	Eighteen of the 33 sites were on privately owned lands, and the other 15 were on state-managed forest land. Treatment reaches were harvested according to the FPA or FMP and included 26 clear-cuts and 7 partial cuts. All	Pre harvest to post harvest comparison of 2 years of data will detect a temperature change of > 0.3°C. Conversely, harvest to state FMP standards resulted in an 8.6% probability of exceedance that did not significantly differ from all other comparisons. The a-priori and secondary post hoc multi-model comparisons did not indicate that timber harvest increased the probability of PCW exceedance at state sites. The authors point out that the 0.3°C change
Groom et al., 2011b	Private site FPA rules are 15 and 21 m wide on small and medium fish-bearing streams with a 6 m no-cut zone immediately adjacent to the stream. Harvesting is allowed in the basal area of 10.0 (small streams) and 22.9 (medium streams) m2/ha. State sites followed a 52 m wide buffer with an 8 m no cut buffer. Limited harvest is allowed within 30	Stream temperature, Shade, canopy cover	Stream temperature collected with digital temperature sensors. Stream temperature data was summarized to provide daily minimum, maximum, mean, and fluctuation for analysis. The temperature data was modeled using mixed-effects linear regression Shade analysis included trees per hectare, basal area per hectare, vegetation plot blowdown, and tree	A comparison of within site changes in maximum temperatures pre-harvest to post-harvest showed an overall increase at private sites, but not all sites behaved the same and some had decreases in maximum temperatures.	Following harvest, maximum temperatures at private sites increased relative to state sites on average by 0.71 °C. Similarly, mean temperatures increased by 0.37 °C (0.24 - 0.50), minimum temperatures by 0.13 °C (0.03 - 0.23), and diel fluctuation increased by 0.58 °C (0.41 - 0.75) relative to state sites. The average of maximum state site temperature changes = 0.0 °C (range = -0.89 to 2.27 °C). Observed maximum temperature changes at private sites averaged 0.73 °C (range = -0.87 to 2.50 °C) and exhibit a greater frequency of post-harvest increases from 0.5 to 2.5 °C compared to state sites. Private site shade values also appeared to decrease pre-harvest to post-harvest. Private post-harvest shade values differed from pre-harvest values (mean change in Shade from 85% to 78%); however, no difference was found for state site shade values pre-harvest to post-harvest (mean change in Shade from 90% to 89%). Results from this
Guenther et al., 2014	Partial retention (50% removal of basal area including riparian zone) methods resulting in approximately 14% reduction in canopy cover on average	Stream temperature, canopy cover, bed temperature	Bed temperatures, stream temperatures, and near stream shallow groundwater temperatures were collected with thermocouples.		Treated watersheds showed an increase of 1.6 - 3.0 °C in daily maximum stream temperatures during the summer months following harvest. Bed temperatures showed an overall increase in temperature but at lower magnitude averaging around 1 °C for up to 30 cm in depth. Bed temperature increases were higher in areas on downwelling flow than in areas of neutral and upwelling flows.
Hunter & Quinn, 2009	an alluvial study site and a bedrock study site whose overall characteristics were otherwise comparable apart from geomorphology.	Stream temperature, Alluvial depth	Water temperature was recorded at 75-m intervals along each channel during the summers of 2003 and 2004	Small sample sizes, results only from two sites for two summers. Actual numeric values not reported but shown in graphs.	Results from this study show consistent differences in stream temperature response in alluvial versus bedrock channels. Seasonal maximum and minimum average daily temperatures varied less at the alluvial site compared to the bedrock site. Two same-day measurements at each site showed the alluvial site gaining 8% of its flow, as compared to the bedrock site whose flow decreased by approximately 15%. Bedrock sites were shown to have the highest variation in
Janisch et al., 2012	clearcut logging with two riparian buffer designs: a continuous buffer and a patched buffered stream. Buffers were 10-15 m wide.	Stream temperature	Channel and catchment attributes (e.g., BFW, Confinement, slope, FPA, etc.), Stream temperatures were recorded with a Tidbit datalogger in areas persistently submerged.	Separation of treatment streams into "clusters" based on year of treatment and an unbalanced experimental design resulted in small sample sizes. Thus, significant differences between treatments were not analyzed. Instead results	In general, timber harvest with fixed-width continuous buffers, or patch buffers resulted in increased mean maximum daily summer stream temperatures in the first year following treatment by an average of 1.5 °C (range 0.2 – 3.6 °C). Mean maximum daily summer temperature increases were higher in the streams adjacent to continuous buffer (1.1 °C; range 0.0 to 2.8°C) than the patch buffered catchments (0.6 °C; range – 0.1 to 1.2°C). However,
Johnson & Jones, 2000	clearcut to stream, patch cutting followed by debris flows (resulted in the removal of all streamside vegetation) , 450+ yo Doug-fir forest reference.	Stream temperature	long term monitoring of weekly stream temperature max, min, and average. Solar radiation data collected from digital sensors. Air and precipitation temperatures collected	The experimental design used historic stream temperature data to examine changes in stream temperatures. This required conflating data from 2 different devices.	Removal of streamside vegetation whether by clearcut and burn (CCB), or patch-cut and debris (PCD) flow led to significant increases in mean weekly summer maximum and minimum stream temperatures relative to reference streams in the summer immediately following and for 3-4 years post treatment. The CCB's summer mean weekly maximum stream temperatures ranged from 5.4-6.4°C higher than the reference stream for 4 years following treatment. The PCD's
Kaylor et al., 2017	50 years post clearcut to streams, control stands were >300 years old	stream light availability, forest age	Stream bank-full width, wetted width, canopy openness, % red alder, and estimated photosynthetically active radiation (PAR) were quantified at 25-m intervals		PAR reaching streams was on average 1.7 times greater in >300-year-old forests than in 30–100-year-old forests. The greatest differences were in streams with both sides harvested. Mean canopy openness was higher in >300-year-old forests (18%) than in 30–100-year-old forests (8.7%). Space-for-time analysis with reviewed literature estimates that canopy closure and minimum light availability occurs at approximately 30 years and maintains until 100 years.
Kibler et al., 2013	Clearcut to stream	Stream temperature, discharge rate,	Stream temperature and discharge rate were recorded with thermistor gauging stations. Canopy cover was recorded with a densiometer as portion of sky covered with	Post-harvest data was collected only during the summer and autumn immediately following harvest (i.e., 1 season of post-harvest data). Pre-harvest data was collected for 3 years.	Harvest in treatment watersheds resulted in a significant decrease in stream temperatures ranging from –1.9 to -2.8 °C relative to pre-treatment temperatures. The authors attribute the lack of increased temperatures to the shade provided by woody debris.
Macdonald et al., 2003b	Low-retention – remove all timber >15 or >20 cm DBH for pine or spruce, 20 m of the stream 2) high-retention – remove timber >30 cm DBH 20-30m of stream, and 3)	Stream temperature	Temperature data were recorded with Vemco dataloggers. Canopy cover was estimated with densiometers.		Significant increase in stream temperatures ranging from 4 – 6 °C at five years post-harvest, and increased ranges of diurnal temperature fluctuations for all treatment streams relative to the reference streams. Streams that had summer maximum mean weekly temperatures of 8°C before harvesting had maximum temperatures near 12°C or more following harvesting. Daily ranges of 1.0–1.3°C before harvesting became 2.0–3.0°C following harvesting, high-retention
McIntyre et al., 2021	(1) unharvested reference, (2) 100% treatment, a two-sided 50-ft riparian buffer along the entire Riparian Management Zone (RMZ), (2) FP treatment a two-sided 50-ft			Hard Rock Study.	Results for canopy cover showed that riparian cover declined after harvest in all buffer treatments reaching a minimum around 4 years post-harvest (after mortality stabilized). The treatments, ranked from least to most change, were REF, 100%, FP, and 0% for all metrics and across all years. Effective shade results showed decreases of 11, 36, and 74 percent in the 100%, FP, and 0% treatments, respectively. Significant post-harvest decreases in shade were
Reiter et al., 2020	Clearcut, no buffer (CC_NB), clearcut with 10-m no cut buffer (CC_B), thinning with 10 m no-cut buffer (TH_B), and unharvested reference (REF) streams.	Stream temperature	Temperature data was separated into 5th, 25th, 50th, 75th, and 95th percentiles. the researchers also quantified the percentage of summer where temperatures where above 16	Sample sizes are relatively low for some treatments. (CC_NB; n = 4); (CC_B; n = 3); (TH_B; n =1); (REF; n = 7).	A 10 m buffer was sufficient in maintaining summer temperature changes compared to reference streams regardless of upland treatment (clear-cut, thinning). Unbuffered streams (Clear-cut to streams) showed significant increases in stream temperatures with an average of 3.6 °C (SE = 0.4) increase relative to reference streams. Unbuffered streams spent 1.3% and 4.7% of the recorded time above 16 °C and 15 °C respectively (habitat temperature thresholds
Roon et al., 2021a	Thinning treatments resulting in a mean shade reduction of <5% (-8.0 - -0.5) at one watershed and 23.0% at two watersheds (-25.8, -20.1)	Stream temperature, solar radiation, Shade	Stream temperature was collected using digital sensors; solar radiation was measured using silicon pyranometers; riparian shade was measured using hemispherical	Only 1-year pre- and post-treatment data. Site selection and replication was not random and thus may not be applicable outside of the northern California redwood forests.	No significant changes in stream temperatures were detected in the low-intensity thinning treatment watersheds. For the higher intensity thinning treatments. Maximum weekly average of the maximum temperatures increased during spring by a mean of 1.7 ˚C (95% CI: 0.9, 2.5), summer by a mean of 2.8 ˚C (1.8, 3.8), and fall by a mean of 1.0 ˚C (0.5, 1.5) and increased in downstream reaches during spring by a mean of 1.0˚ C (0.0, 2.0) and summer by a mean of 1.4˚
Roon et al., 2021b	Effective shade reductions ranging between 19-30% along 200 m reach, or 4-5% along 100 m reach.	local and downstream temperature	Stream temperature collected with digital temperature sensors within harvest area and every 200 m downstream of stream network.	Stream temperature data was only collected for one-year pre- and one-year post-harvest.	In the reaches with higher reductions in shade (19-30%) there was accumulation of 45° to 115°C additional degree days from pre- to post treatment years, while the reaches with lower reductions in shade (4-5%) only accumulated 10° to 15°C additional degree days. Travel distance of increased stream temperatures also appeared to be dependent on thinning intensity. The lower shade reduction reaches had an increased temperature effect downstream
Sugden et al., 2019	Montana state law : 15.2 m wide buffers no more than half the trees greater than 204 mm (8 in) diameter at breast height (DBH). In no case, however, can stocking levels of leave trees be reduced to less than 217 trees per hectare. .	Stream temperature, fish population, Canopy cover	Daily max, min, and average stream temperatures collected with data loggers during summer months. The fish community was inventoried 100 m reaches using an electro-fishing pass of capture method. Canopy cover was estimated using a	Data only collected for one year pre-harvest and one year post-harvest.	The mean basal area (BA) declined from 30.2 m2/ha pre-harvest to 26.4 m2/ha post-harvest (mean = –13%, range from -32% to 0%). Windthrow further reduced the mean BA to 25.9 m2/ha (mean = -2%, range = -32% -0%). Change in mean canopy cover were not significant based on the simulation modeling (-3%), or densiometer readings (+1%). Results of the model for the effect of harvest on stream temperature showed no detectable increase in treatment streams relative to control streams. The estimated mean site level response in maximum weekly maximum temperatures (MWMT) varied from –2.1 °C to +3.3 °C. Overall, 20 of 30 sites

Swartz et al., 2020	In the experimental reaches 30 m gaps were created, centered on a tree next to the stream and at least 30 m in from the beginning of the reach. Actual gap sizes varied across sites from approximately 514 m2 to 1,374 m2 with a mean of 962 m2	Stream temperature, Light reaching stream, canopy cover	Riparian shade-hemispherical photos. Light reaching the stream-photodegradation of fluorescent dyes. Stream temperature - HOBO sensors for seven-day moving average of mean and maximum temperatures.	Data was collected for one year pre-harvest, during harvest year (harvest took place in late fall 2017), and one-year post-harvest.	Results showed that after gaps were cut, the BACI analysis showed strong evidence for significant increase in mean reach light (p < 0.01) to a mean of 3.91 (SD ± 1.63) moles of photons m−2 day−1 , overall resulting in a mean change in light of 2.93 (SD ± 1.50) moles of photons m−2 day−1. Through the entirety of the treatment reach mean shading declined by only 4% (SD ± 0.02%). Overall, the gap treatments did not change summer T 7DayMax or T 7DayMean significantly across the 6 study sites. However, reaches showed a statistically significant effect of the gap for average daily maximums (p < 0.01) and for average daily means (p = 0.02). The regression comparison reveals there will be on average an additional 0.12 °C/ºC
Warren et al., 2013	Old-growth forests were estimated to be over 500 years old, and mature second growth forests were estimated to be between 31 and 59 years old.	Light reaching bottom of stream, canopy cover	The percent of canopy cover was estimated using a densiometer, the amount of light reaching the bottom of the stream was estimated using a fluorescent dye that degrades overtime from light exposure	Relatively small sample sizes (n = 4). Significant differences were only found in 3 of the four paired reaches.	Results showed that the differences in stream light availability and percent forest cover between old-growth and second-growth reaches were significant in both south-facing watersheds in mid-summer at an alpha of 0.01 for the dye results and 0.10 for the cover results. For the north-facing watersheds differences in canopy cover and light availability (alpha = 0.01, and 0.10 respectively) were only significant at 1 of the two reaches. Overall, three of the four paired old-growth reaches had significantly lower mean percent canopy cover, and