				Potential Riparian Buffer Characteristics[Δ]			
Riparian Buffer Function	**Buffer Width Range***	**Buffer Length Range***	**Snoqualmie Landscape Specifics****	**Relative Width**	**Length & Continuity**	**Composition & Density**	**Supportive Literature Information**
Water Quality - Nutrients, Sediment, Pesticides	10 ft-328 ft	984 ft-4,920 ft	**Various watercourses** (floodplain low-gradient watercourses including mainstem channels, floodplain channels, low-gradient tributaries)	Less-wide (relative to watercourse size-width)	Long-continuous	Trees and woody vegetation	• Low-gradients areas have higher removal efficacies of sediment, nutrients, and pesticides, compared to higher gradient areas • Soils with higher clay content have greater potential for nutrients and pesticide removal • Woody vegetation including shrubs and trees have higher removal efficacies of nutrients and pesticides compared to grasses • Long-continuous buffers have greater nutrient and pesticide uptake/processing compared to fragmented buffers; narrower buffer that are long-continuous are more effective than wide-fragmented buffers
			Maintained watercourses (dredged/ straightened)	Wide	Long-continuous	Trees and woody vegetation	• Straightened/channelized watercourses require wider, longer, and more continuous riparian buffers to compensate for lost capacity in aquatic in-stream microbial processing
Water Quality - Temperature & Riparian Shade	5 ft-225 ft	328 ft-8,202 ft	**Smaller watercourses** (east-west orientation)	Less-wide (relative to watercourse size-width)	Long-continuous	Dense vegetation	• Smaller watercourses are most susceptible to temperature fluctuations and provide the greatest potential for shading benefits among watercourse sizes • Riparian vegetation height and density significantly influencing watercourse shading • Riparian buffer length accounts for a majority of temperature variation (the longer the buffer length, the greater the shading benefit) • Narrow-dense riparian buffers are most effective on east-west oriented watercourses • Wider-taller buffer width are needed for shading on north-south oriented watercourses • Agricultural-maintained channels may only require dense and overhanging buffers at relatively narrow widths to provide shade benefits
			Smaller watercourses (north-south orientation)	Wide	Long-continuous	Dense-Tall vegetation	
			Smaller watercourses (agricultural watercourses)	Less-wide (relative to watercourse size-width)	Long-continuous	Dense vegetation	
			Larger watercourses	Wide	Long-continuous	Dense -Tall vegetation	• Larger waterways require tall, dense, and wide riparian buffers to shade waterbodies

* Riparian buffer widths and lengths that supports at least 50% and greater of a given function; reported values summarized from reviewed literature

** Relative watercourse sizes and characteristics applicable to the Lower Snoqualmie Valley

[Δ] Information summarized from reviewed literature

				Potential Riparian Buffer Characteristics[Δ]			
Riparian Buffer Function	**Buffer Width Range***	**Buffer Length Range***	**Snoqualmie Landscape Specifics****	**Relative Width**	**Length & Continuity**	**Composition & Density**	**Supportive Literature Information**
Riparian Corridor Microclimate	50 ft-328 ft		**Various watercourses**	Wide (based on 1-2 conifer tree height)	Long-continuous		• Riparian buffer width, length, and continuity helps protect microclimate extent and presence from surrounding landscape climate conditions • Riparian areas closer to watercourses protect stream-center microclimate and riparian areas further from watercourses protect off-stream microclimate • The ability of microclimate conditions to buffer water temperatures decreases with increasing watercourse size-width
Large Woody Debris (Recruitment and Retention)	13 ft-213 ft		**Large watercourses** (mainstem channels, large tributaries, alluvial reaches)	Wide (based on conifer tree height)		Mixed trees (conifer and deciduous)	• Primary wood input = erosion • Areas of channel migration require wide buffers to provide continual wood sources • Large channels require relatively larger woody debris (i.e., tall and wide) to remain stable and influence channel processes • Coniferous trees provide long-term habitat benefits and deciduous provides short-term benefits
			Armored watercourses (reaches with armored banks)	Wide (based on conifer tree height)		Mixed trees (conifer and deciduous)	• Armoring shifts wood input drivers from erosion to wind throw and mortality • Large wood source distance from wind throw and mortality is based on max tree height (potential fall distance)
			Smaller watercourses (floodplain channels, small tributaries, maintained small channels)	Less-Wide		Mixed Trees (deciduous & woody vegetation)	• Size of habitat-forming wood is relatively smaller in smaller watercourses • Smaller watercourses receive a greater proportion of woody debris inputs from shorter source distances (closer to watercourses) • Hardwoods generally contributes more large woody debris in smaller channels
			High-gradient watercourses	Wide			• Primary wood inputs = debris flows, landslides, and wind throw (greater source distances than bank erosion) • High-gradient tributaries contribute to instream wood which is transported to downstream reaches

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** Relative watercourse sizes and characteristics applicable to the Lower Snoqualmie Valley

[Δ] Information summarized from reviewed literature

				Potential Riparian Buffer Characteristics[Δ]			
Riparian Buffer Function	**Buffer Width Range***	**Buffer Length Range***	**Snoqualmie Landscape Specifics****	**Relative Width**	**Length & Continuity**	**Composition & Density**	**Supportive Literature Information**
Erosion and Bank Stability	10 ft-164 ft		**Larger watercourses** (mainstem channels, large tributaries)	Wide (based on 1/2 conifer tree height)		Mixed trees (conifer and deciduous)	• Woody riparian vegetation provides the greatest bank stabilization for large watercourses • Woody vegetation is more effective than shrubs/grasses on steep banks • Maximum root strength and depth can be achieve at around ½ site potential tree heights
			Smaller watercourses (floodplain channels, low-order tributaries)			Shrubs, grasses	• Grass/shrubs may be suitable for smaller watercourses which have relatively less-steep banks
			Maintained watercourses (dredged/ straightened)			Trees, shrubs	• Dredging and channelization can increase bank steepness and instability • Dredged/channelized smaller watercourses may require woody tree vegetation, rather than grass/shrubs (due to related bank steepness)
			Outside bends of watercourses	Wide (based on 1/2 conifer tree height)		Dense vegetation	• Bank erosion commonly occurs on the outside of river bends; outside bends with riparian vegetation can significantly decrease erosion during storm events • The denser vegetation is along outside bends, the more effective riparian vegetation is at reducing erosion impacts
Invertebrate Prey and Litter-Detritus Inputs	10 ft-246 ft	164 ft-1,969 ft	**Larger watercourses** (mainstem channels, large tributaries)	Less-Wide	Long-continuous	Mixed trees (conifer and deciduous)	• Relative contribution and role of litter and detrital inputs tends to decrease from small streams to large streams • Riparian corridor length and continuity may be the primary drivers of macroinvertebrate structure and diversity • Percentage of tree coverage in a riparian corridor is positively related to stream invertebrate community structure and diversity • Deciduous trees provides seasonally pulses inputs and conifers trees provide year-around inputs
			Smaller watercourses (floodplain channels, smaller tributaries, headwaters, valley-wall channels)	Wide	Long-continuous	Mixed trees (conifer and deciduous)	

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[Δ] Information summarized from reviewed literature